Napomene

Navedeni brojevi strana odgovaraju štampanom izdanju ove knjige. Možete koristiti funkciju pretrage na svom uređaju kako biste locirali pojedine termine u tekstu.

Uvod: Gospodari života i smrti

13 **oborila je putnički avion:** Tom Paterson, „The downing of Flight 007: 30 years later, a Cold War tragedy still seems surreal", CNN.com, 31. avgust 2013, http://www.cnn.com/2013/08/31/us/kal-fight-007-anniversary/index.html.

14 **Stanislav Petrov:** Dejvid Hofman, „'I Had a Funny Feeling in My Gut,' „*Washington Post,* 10. februar 1999, http://www.washingtonpost.com/wp-srv/inatl/longterm/coldwar/shatter021099b.htm.

14 **crveno obasjani ekran:** Pavel Aksenov, „Stanislav Petrov: The Man Who May Have Saved the World", *BBC.com,* 26. septembar 2013, http://www.bbc.com/news/world-europe-24280831.

14 **sveukupno pet:** Ibid.

14 **Petrov je imao čudan osećaj:** Hofman, „I Had a Funny Feeling in My Gut.'"

14 **Petrov je procenio:** Aksenov, „Stanislav Petrov: The Man Who May Have Saved the World".

18 **Već šesnaest država ima naoružane dronove:** Sjedinjene Države, Ujedinjeno Kraljevstvo, Izrael, Kina, Nigerija, Iran, Irak, Jordan, Egipat, Ujedinjeni Arapski Emirati, Saudijska Arabija, Kazahstan, Turkmenistan, Pakistan, Mjanmar, Turska. Mat Furman i Majkl C. Horowic, „Droning On: Explaining the Proliferation of Unmanned Aerial Vehicles", *International Organization,* 71 br. 2 (Proleće 2017), 397–418.

18 **„sledećom industrijskom revolucijom":** „Robot Revolution – Global Robot & AI Primer", *Bank of America Merrill Lynch*, 16. decembar 2015, http://www.bofaml.com/content/dam/boamlimages/documents/PDFs/robotics_and_ai_condensed_primer.pdf.

18 **Kevin Keli:** Kevin Keli, „The Three Breakthroughs That Have Finally Unleashed AI on the World", *Wired,* 27. oktobar 2014, http://www.wired.com/2014/10/future-of-artificial-intelligence/.

kognitizaciju mašine: *Antonio Manzalini, „Cognitization is Upon Us!",*5G Network Softwarization*, 21. maj 2015, http://ieee-sdn.blogspot.com/2015/05/cognitization-is-upon-us.html.*

18 **„potpuno robotizovana… vojnih operacija":** Robert Koulson, „Top Russian General Lays Bare Putin's Plan for Ukraine", *Huffington Post*, 2. septembar 2014, http://www.huffingtonpost.com/robert-coalson/valery-gerasimov-putin-ukraine_b_5748480.html.

19 **zvaničnici Ministarstva odbrane:** Zamenica asistenta ministra odbrane za istraživanje Melisa Fleg, kako je citirao Stu Magnuson, „Autonomous, Lethal Robot Concepts Must Be 'On the Table,' DoD Official Says", 3. mart 2016, http://www.nationaldefensemagazine.org/blog/Lists/Posts/Post.aspx?ID=2110.

19 **Danas VI programi:** Za pregled mašinskih sposobnosti i ograničenja koja danas postoje za prepoznavanje slika i njihovo razumevanje, videti JASON, „Perspectives on Research in Artificial Intelligence and Artificial General Intelligence Relevant to DoD, JSR-16-Task-003", The Mitre Corporation, januar 2017, 10–11, https://fas.org/irp/agency/dod/jason/ai-dod.pdf.

21 **Više od 3.000 stručnjaka za robotiku i veštačku inteligenciju:** „Autonomous Weapons: An Open Letter From AI & Robotics Researchers", *Future of Life Institute,* http://futureoflife.org/open-letter-autonomous-weapons/. Pored toga, više od stotinu osnivača i generalnih direktora kompanija za robotiku i VI potpisalo je otvoreno pismo 2017. upozoravajući na opasnosti od autonomnog

oružja. Ovo drugo pismo je, međutim, sadržalo prigušeniji poziv na akciju. Umesto pozivanja na zabranu kao u pismu iz 2015, pismo iz 2017. jednostavno je molilo zemlje koje učestvuju u raspravama u Ujedinjenim nacijama da „pronađu način da nas sve zaštite od svih tih opasnosti." „An Open Letter to the United Nations Convention on Certain Conventional Weapon", pristup 24. avgusta 2017, https://www.dropbox.com/s/g4ijcaqq6ivq19d/2017%20Open%20Letter%20to%20the%20United%20Nations%20Convention%20on%20Certain%20Conventional%20Weapon.pdf?dl=0.

21 **Kampanji za sprečavanje robota ubica:** „Who We Are", *Campaign to Stop Killer Robots*, http://www.stopkillerrobots.org/coalition/.

21 „**globalne trke u VI naoružavanju":** Autonomous weapons: An Open Letter From AI & Robotics Researchers", *Future of Life Institute.*

22 **„Ako naši konkurenti pribegnu Terminatorima":** Bob Vork, napomene na Globalnom strateškom forumu Atlantskog veća, Vašington, 2. maj 2016, http://www.atlanticcouncil.org/events/webcasts/2016-global-strategy-forum.

22 **„Glavolomkom Terminatora":** Endru Klevendžer, „'The Terminator Conundrum': Pentagon Weighs Ethics of Pairing Deadly Force, AI", *Defense News,* 23. januar 2016, http://www.defensenews.com/story/defense/policy-budget/budget/2016/01/23/terminator-conundrum-pentagon-weighs-ethics-pairing-deadly-force-ai/79205722/.

1 Nailazi roj: Revolucija u vojnoj robotici

27 **Globalna potrošnja na vojnu robotiku:** „Robot Revolution – Global Robot & AI Primer", *Bank of America Merrill Lynch.*

28 **šest puta na više od dve milijarde dolara:** Office of the Secretary of Defense, „Unmanned Aircraft Sistems Roadmap, 2005–2030", 4. avgust 2005, 37, Slika 2.6-1, http://fas.org:8080/irp/program/collect/uav_roadmap2005.pdf.

28 „**izviđanje preko brda":** Dajk Vederington, „Unmanned Aircraft Sistems Roadmap, 2005–2030", prezentacija, 2005, http://www.uadrones.net/military/research/acrobat/050713.pdf.

28 **stotine dronova:** Ibid.

29 **Dronovi nisu bili novi:** Tomas P. Erhard, „Air Force UAVs: The Secret History", jul 2010 Mitchell Institute Study, 28.

29 **više od šest milijardi dolara godišnje:** Office of the Secretary of Defense, „Unmanned Sistems Integrated Roadmap, FY2011–2036“, 13, http://www.acq.osd.mil/sts/docs/Unmanned%20Sistems%20Integrated%20Roadmap%20FY2011-2036.pdf.

29 **MO je imalo više od 7.000 dronova:** Ibid, 21.

29 **višeod 6.000 kopnenih robota:** Kancelarija ministra odbrane, „Unmanned Sistems Integrated Roadmap, FY2009–2034“, 3, http://www.acq.osd.mil/sts/docs/UMSIntegratedRoadmap2009.pdf.

30 „**Da bi neposednuti sistemi potpuno realizovali“:** Kancelarija ministra odbrane, „Unmanned Sistems Integrated Roadmap, FY2011–2036“, 45.

30 **sredstva komunikacije koja su otpornija na ometanje:** Keli Sejler, „Talk Stealthy to Me“, *War on the Rocks*, 4. decembar 2014, https://warontherocks.com/2014/12/talk-stealthy-to-me/.

31 **ljudski pilot mogao da ostane efikasan sedeći u kokpitu:** Grejem Vorik, „Aurora Claims Endurance Record For Orion UAS“, *Aviation Week&Space Technology*, 22. januar 2015, http://aviationweek.com/defense/aurora-claims-endurance-record-orion-uas. Pol Šar, „The Value of Endurance“, Center for a New American Security, Washington, DC, 12. novembar 2015, https://www.cnas.org/publications/blog/infographic-the-value-of-endurance.

32 „**Autonomija smanjuje količinu ljudskog rada“:** Kancelarija ministra odbrane, „Unmanned Sistems Integrated Roadmap, FY2011–2036“, 45.

32 „**potpuno autonomnim rojevima“:** Kancelarija ministra odbrane, „Unmanned Aircraft Sistems Roadmap, 2005–2030“, 48.

32 **Mapa puta iz 2011. artikulisala je… četiri nivoa autonomije:** Kancelarija ministra odbrane, „Unmanned Sistems Integrated Roadmap, FY2011–2036“, 46.

32 „**najveća tema od svih“:** Kancelarija za nauku američkog Ratnog vazduhoplovstva, „Tehnologija Horizons: A Vision for Air Force Science and Tehnologija During 2010-30“,15. maj 2010, *xx* http://www.defenseinnovationmarketplace.mil/resources/AF_TehnologijaHorizons2010-2030.pdf.

34 „**Ako imam 50 aviona“:** Razgovor sa Dvejnom Dejvisom, 10. maj 2016.

35 **„pedeset ljudi i pedeset lopti“:** Ibid.

36 **kolonija se kolektivno sliva na najbržu trasu:** Gos S., Bekers R., Deneburg J. L., Aron S., Pastels J. M., „How Trail Laying and Trail Following Can Solve Foraging Problems for Ant Colonies", kod Hjuza R. N., ur. *Behavioural Mechanisms of Food Selection*, *NATO ASI Series* (Series G: Ecological Sciences), tom 20 (Berlin, Heidelberg: Springer, 1990) http://www.ulb.ac.be/sciences/use/publications/JLD/77.pdf.

36 ***stigmergija**:* Za odličan pregled životinjskog rojenja pogledati Erika Bonaboa, Gaja Terolaza, Marka Doriga, Swarm Intelligence: From Natural to Artificial Sistems (New York: Oxford University Press, 1999).

38 „**kolektivni organizam… poput rojeva u prirodi":** Kris Baranjuk, „US Military Tests Swarm of Mini-Drones Launched from Jets", *BBC News,* 10. januar 2017, http://www.bbc.com/news/tehnologija-38569027. Shawn Snow, „Pentagon Successfully Tests World's Largest Micro-Drone Swarm", *Military Times,* 9. januar 2017, http://www.militarytimes.com/articles/pentagon-successfully-tests--worlds-largest-micro-drone-swarm.

38 **Demonstrirala roj od 119 dronova:** Emili Feng i Čarls Klover, „Drone Swarms vs. Conventional Arms: China's Military Debate", *Financial Times*, 24. avgust 2017.

38 **roj malih čamaca:** Kancelarija za pomorska istraživanja, „Autonomous Swarm", video, 4. oktobar 2014, https://www.youtube.com/watch?v=ITTvgkO2Xw4.

38 **Sarađivalo pet čamaca:** Ibid.

38 „**prekretnicom u igri":** Bob Brizolara citiran u Kancelariji za pomorska istraživanja, „Autonomous Swarm."

39 **„uvek prisutan čovek":** Sidni Dž. Fridburg, Ml., „Naval Drones 'Swarm', But Who Pulls The Trigger?" *Breaking Defense,* 5. oktobar 2015, http://breakingdefense.com/2014/10/who-pulls-trigger-for--new-navy-drone-swarm-boats/.

40 „**Cilj: Srušiti protivnikov sistem**": Džoh Bojd, „Patterns of Conflict",ur. Čet Ričards i Čak Spini, prezentacija, slajd 87, januar 2007.

41 „**bez ljudskog upliva":** Ratno vazduhoplovstvo Sjedinjenih Država, „Unmanned Aircraft Sistems Flight Plan, 2009–2047", 18. maj 2009, 41, https://fas.org/irp/program/collect/uas_2009.pdf.

41 **„Davanje ovlašćenja jednoj mašini":** Ibid, 41.

42 **„Političke smernice“:** Kancelarija Ministarstva odbrane, „Unmanned Sistems Integrated Roadmap, FY2011–2036“, 50.

2 Terminator i *Rumba*: Šta je autonomija?

44 **Tri zakona robotike:** Tri zakona robotike Isaka Asimova prvi put su se pojavila u svom originalnom obliku u kratkoj priči „Kolo-na-okolo“, u njegovoj zbirci iz 1950. *Ja, robot.* Isak Asimov, *I, Robot*, (New York: Grome Press, 1950).

46 **izbavivši američki F-16 u Siriji:** Gaj Noris, „Ground Collision Avoidance Sistem 'Saves' First F-16 In Syria“, *Aerospace Daily & Defense Report,* 5. februar 2015, http://aviationweek.com/defense/ground-collision-avoidance-sistem-saves-first-f-16-syria.

3 Mašine koje ubijaju: Šta je autonomno oružje?

54 **Dobro obučeni vojnici mogli su da ispale:** Džordž Knap, „Rifled Musket, Springfield, Model 1861“, u Džerold E. Braun, *Historical Dictionary of the U.S. Army* (Santa Barbara, CA: Greenwood Publishing Group, 2001), 401.

54 **„Getlingov mitraljez… mnogo mi se dopao.“:** Navod iz Džulija Keler, *Mr. Gatling's Terrible Marvel* (New York: Penguin Books, 2009).

55 **više od stotinu ljudi:** Getlingov mitraljez je mogao da ispali 350–400 metaka u minutu. Dobro obučeni vojnik iz doba Građanskog rata mogao je da ispali tri metka u minutu iz Springfildove puške, tako da je stotinu ljudi moglo da ispali 300 metaka u minutu. Džordž Knap, „Rifled Musket, Springfield, Model 1861.“

55 **Motivacija Ričarda Getlinga:** Keler, *Mr. Gatling's Terrible Marvel*, 7.

55 **„Palo mi je na pamet“:** Ibid, 27.

55 **Getling je bio uspešan pronalazač:** Ibid, 71.

55 **„ima istu vezu“:** Ibid, 43.

58 **koji su bili pokošeni:** Ibid, 9.

59 **B. F. Skiner:** C. V. Glajns, „Top Secret WWII Bat and Bird Bomber Program“,HistoryNet.com, 12. jun 2006, http://www.historynet.com/top-secret-wwii-bat-and-bird-bomber-program.htm.

59 **G7e/T4 *Falke*:** „The Torpedoes“, uboat.net, http://uboat.net/technical/torpedoes.htm, pristup 19. juna 2017; „Torpedoes of Germany“,

NavWeaps, http://www.navweaps.com/Weapon/WTGER_WWII.php, pristup 19. juna 2017; „TV (G7es) Acoustic Homing Torpedo“, German U-Boat, http://www.uboataces.com/torpedo-tv.shtml, pristup 19. juna 2017.

59 **G7es/T5 *Zaunkönig*:** Ibid.

59 **taktiku momentalnog zaranjanja:** Ibid.

60 **s poboljšanim akustičnim tragačem:** „The Torpedoes.“ „Torpedoes of Germany.“ „TV (G7es) Acoustic Homing Torpedo.“

61 **leteća protivbrodska bomba Šišmiš:** Džim Svini, „Restoration: The Bat“, *Air&Space Magazine* (januar 2002), http://www.airspacemag.com/military-aviation/restoration-the-bat-2925632/.

62 **kao o „besnom psu“:** Air Land Sea Application Center, „Brevity: Multi-Service Brevity Codes“, februar, 2002, http://www.dtic.mil/dtic/tr/fulltext/u2/a404426.pdf, I–19.

63 **dopušta projektilu da proleti kraj drugih brodova:** „Harpoon Missiles“, United States Navy Fact File, http://www.navy.mil/navydata/fact_display.asp?cid=2200&tid=200&ct=2, pristup 19. juna 2017. „Harpoon“, WeaponSystems.net, http://weapnsystems.net/weapnsystem/HH10+-+Harpoon.html, pristup 19. juna 2017.

63 **Sistem naoružanja se sastoji od:** Zvanična definicija MO za „sistem naoružanja“ donekle je šira jer obuhvata opremu za osoblje i podršku kako bi oružje moglo da funkcioniše: „Kombinacija jednog ili više oružja s potrebnom opremom, materijalima, uslugama, osobljem i sredstvima isporuke i raspoređivanja (ako je to primenjivo) potrebnim za samodovoljnost.“ Američko Ministarstvo odbrane, „sistem naoružanja“, u „DoD Dictionary of Military and Associated Terms“, mart 2017, http://www.dtic.mil/doctrine/dod_dictionary/data/w/7965.html.

64 **„Pošto su „preciznoj municiji“ potrebni detaljni podaci“:** Bari D. Vots, „Six Decades of Guided Munitions and Battle Networks: Progress and Prospects“, Center for Strategic and Budgetary Assessments, Washington, DC, mart 2007, http://csbaonline.org/uploads/documents/2007.03.01-Six-Decades-Of-Guided-Weapons.pdf, ix.

66 **Trenutno najmanje trideset zemalja primenjuje:** Australija, Bahrein, Belgija, Kanada, Čile, Kina, Egipat, Francuska, Nemačka, Grčka, Indija, Izrael, Japan, Kuvajt, Holandija, Novi Zeland, Norveška, Pakistan, Poljska, Portugalija, Katar, Rusija, Saudijska Arabija, Južna Afrika, Južna Koreja, Španija, Tajvan, Ujedinjeni Arapski Emirati,

Ujedinjeno Kraljevstvo i Sjedinjene Države. Pol Šar i Majkl Horovic, „An Introduction to Autonomy in Weapon Systems", Center for a New American Security, februar 2015, Appendix B, https://s3.amazonaws.com/files.cnas.org/documents/Ethical-Autonomija-Working-Paper_021015_v02.pdf.

68 **Neka lebdeća municija zadržava ljude u petlji:** Den Getinger i Artur Holand Majkl, „Loitering Munitions", Center for the Study of the Drone at Bard College, 10. februar 2017, http://dronecenter.bard.edu/files/2017/02/CSD-Loitering-Munitions.pdf.

68 **Harpija je prodata nekolicini zemalja:** Israel Aerospace Industries, „Harpy NG", http://www.iai.co.il/Sip_Storage//FILES/5/41655.pdf. Israel Aerospace Industries, „Harpy NG", http://www.iai.co.il/2013/36694-16153-en/IAI.aspx. „Harpy",Israeli-Weapons.com, http://www.israeli-weapons.com/weapons/aircraft/uav/harpy/HARPY.html. „Harpy Air Defense Suppression Sistem", Defense Update, http://defense-update.com/directory/harpy.htm. Tamir Eshel, „IAI Introduces New Loitering Weapons for Anti-Radiation, Precision strike", Defense-Update.com, 15. februar 2016, http://defense-update.com/20160215_loitering-weapons.html.

69 **u vazduhu samo oko četiri i po minuta:** United States Navy, „AGM-88 HARM Missile", 20. februar 2009, http://www.navy.mil/navydata/fact_display. asp?cid=2200&tid=300&ct=2.

69 **da ostane u vazduhu duže od dva i po sata:** Robert O'Gorman i Kris Abot, „Remote Controle War: Unmanned Combat Air Vehicles in China, India, Israel, Iran, Rusija and Turkey" (javno izlaganje, septembar 2013), 75, http://www.oxfordresearchgroup.org.uk/sites/default/files/Remote%20Control%20War.pdf.

69 **Protivbrodski projektil Tomahavk (TASM):** Karlo Kop, „Tomahawk Cruise Missile Variants", Air Power Australia, http://www.ausairpower.net/Tomahawk-Subtypes.html.

71 **Tomahavk za napad na kopnene mete [TLAM]:** U.S. Navy, „Tactical Tomahawk", http://www.navair.navy.mil/index.cfm?fuseaction=home.display&key=F4E98B0F-33F5-413B-9FAE-8B8F7C5F0766.

71 **TASM je izbačen iz mornaričke upotrebe:** Protivbrodski projektil Tomahavk (TASM) se odnosi na BGM/RGM-109B, varijantu Tomahavka koju je američka Ratna mornarica primenjivala od 1982. do 1994. Godine 2016, Ratna mornarica je odlučila da rekonfiguriše

postojeće projektile Tomahavk za napad na kopnene mete (TLAM) u novu protivbrodsku verziju Tomahavka, koja će ući u upotrebu 2021. godine. Sem LaGron, „WEST: U.S. Navy Anti-Ship Tomahawk Set for Surface Ships, Subs Starting in 2021", *USNI News*, 18. februar 2016, https://news.usni.org/2016/02/18/west-u-s-navy-anti-ship-tomahawk-set-for-surface-ships-subs-starting-in-2021.

72 **Tihu dugu:** Karlo Kop, „Rockwell AGM-130A/B and Northrop AGM-136A Tacit Rainbow", Air Power Australia, poslednji put ažurirano 27. januara 2014, http://www.ausairpower.net/TE--AGM-130-136.html. Andreas Parsch, „AGM/BGM-136", Designation-Sistems.net, 2002, http://www.designation-sistems.net/dusrm/m-136.html.

72 **JANS:** Andreas Parš, „LOCAAS", Designation-Sistems.net, 2006, http://www.designation-sistems.net/dusrm/app4/locaas.html

73 **110 miliona kopnenih mina:** Grejsa Mačel, „Impact of Conflict on Armed Children", UNICEF, 1996, http://www.unicef.org/graca/.

73 **Sporazum iz Otave:** Međunarodni komitet Crvenog krsta, „Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction, 18 September 1997", ICRC.org, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/States.xsp?xp_viewStates=XPages_NORMStatesParties&xp_treatySelected=580.

73 **Protivtenkovske kopnene mine i pomorske mine i dalje su dozvoljene:** Od 2004. do 2014, američka politika što se tiče kopnenih mina nalagala je upotrebu jedino samouništavajućih/samodeaktivirajućih mina. Američki Stejt department, „New United States Policy on Landmines: Reducing Humanitarian Risk and Saving Lives of United States Soldiers", U.S. Department of State Archive, 27. februar 2004, http://2001-2009.state.gov/t/pm/rls/fs/30044.htm. Godine 2014, Sjedinjene Države su donele novu politiku svrstavši se uz propise Sporazuma iz Otave, s izuzetkom Korejskog poluostrva. Američki Stejt department, „U.S. Landmine Policy", State.gov, http://www.state.gov/t/pm/wra/c11735.htm.

73 **Torpedne mine u kućištima:** „Mine Warfare Trends", Mine Warfare Association, prezentacija, 10. maj 2011, www.minwara.org/Meetings/2011_05/Presentations/tuespdf/WMason_0900/MWTrends.pdf.

73 **Mk 60 CAPTOR:** Federation of American Scientists, „MK60 Encapsulated Torpedo (CAPTOR)“, FAS Military Analysis Network, 13. decembar 1998, https://web.archive.org/web/20160902152533/http://fas.org:80/man/dod-101/sys/dumb/mk60.htm.

74 **ruska PMK-2:** Scott C. Truver, „Taking Mines Seriously: Mine Warfare in China's Near Seas“, Naval War College Review, 65 no. 2 (Proleće 2012), 40–41, https://www.usnwc.edu/getattachment/19669a3b-6795-406c-8924-106d7a5adb93/Taking-Mines-Seriously-Mine-Warfare-in-China-s-Ne. Andrew S. Erickson, Lyle J. Goldstein, and William S. Murray, „Chinese Mine Warfare“, China Maritime Studies Institute, (Newport, RI: Naval War College, 2009), 16, 20, 28–30, 44, 90.

74 **Oružje sa senzorskim osiguračem:** Textron Sistems, „SFW: Sensor Fuzed Weapon“, video, objavljen 21. novembra 2015, https://www.youtube.com/watch?v=AEXMHf2Usso.

76 **TASM je bio u upotrebi u američkoj Ratnoj mornarici od 1982. do 1994. godine:** „Harpoon“, NavSource Online, http://www.navsource.org/archives/01/57s1.htm. James C. O'Halloran, ed., „RGM/UGM-109 Tomahawk“, *IHS Jane's Weapons: Strategic, 2015-2016* (United Kingdom, 2015), 219-223. Karlo Kop, „Tomahawk Cruise Missile Variants.“ „AGM/BGM/RGM/UGM-109“, Designation-Sistems.net, http://www.designation-sistems.net/dusrm/m-109.html.

77 **„nedostatak pouzdanja u to kako će se slika mete“:** Brajan Makgrat, intervju, 19. maj 2016.

77 **„oružje koje jednostavno nismo želeli da ispalimo“:** Ibid.

77 **„Zato što oružje košta“:** Ibid.

78 **Harpija 2, ili Harop:** Javno dostupni dokumenti ne govore jasno o tome da li Harop zadržava sposobnost Harpije da potpuno autonomno dejstvuje protiv radara u jednom režimu rada. *Israel Aerospace Industries*, koja je razvila Harpiju i Harop, odbila je da komentariše pojedinosti o funkcionalnosti Harpije i Haropa. *Israel Aerospace Industries*, „Harop“, http://www.iai.co.il/2013/36694-46079-EN/Business_Areas_Land.aspx.

79 „**Morate razgovarati s projektilom“:** Brajan Makgrat, interviju, 19. maj 2016.

80 **Najmanje šesnaest zemalja već poseduje:** Sjedinjene Države, Ujedinjeno Kraljevstvo, Izrael, Kina, Nigerija, Iran, Irak, Jordan, Egipat, Ujedinjeni Arapski Emirati, Saudijska Arabija, Kazahstan,

Turkmenistan, Pakistan, Mjanmar, Turska. Furman i Horovic, „Droning On: Explaining the Proliferation of Unmanned Aerial Vehicles."

4 Budućnost se gradi danas: Autonomni projektili, dronovi i rojevi robota

84 **MQ-25 se zamišlja prevashodno kao tanker:** Sidni Dž. Fridburg, Ml., „CBARS Drone Under OSD Review; Can A Tanker Become A Bomber? "*Breaking Defense*, 19. februar 2016, http://breakingdefense.com/2016/02/cbars-drone-under-osd-review-can-a-tanker-become-a-bomber/. Richard Whittle, „Navy Refueling Drone May Tie Into F-35s", *Breaking Defense,* 22. mart 2016, http://breakingdefense.com/2016/03/navy-refueling-drone-may-tie-into-f-35s-f-22s/.

86 ***Vektora daljinski pilotirane letelice*** **Ratnog vazduhoplovstva iz 2013:** Ratno vazduhoplovstvo Sjedinjenih Država, „RPA Vector: Vision and Enabling Concepts, 2013–2038", 17. februar 2014, http://www.defenseinnovationmarketplace.mil/resources/USAF-RPA_VectorVisionEnablingConcepts2013-2038_ForPublicRelease.pdf.

86 **kulturološki otpor prema borbenim dronovima:** Džeremaja Gertler, „History of the Navy UCLASS Program Requirements: In Brief", Congressional Research Service, 3. avgust 2015, https://www.fas.org/sgp/crs/weapons/R44131.pdf.

86 **bespilotnu borbenu letelicu:** BBL se konkretno odnosi na vazdušna vozila, a BBS na čitav sistem: vazdušno vozilo, komunikacione veze i kopnena kontrolna stanica. U praksi, ti termini se često mešaju.

87 **Kina je razvila protivbrodske balističke i krstareće projektile:** Keli Sejler, „Red Alert: The Growing Threat to U.S. Aircraft Carriers", Center for a New American Security, Washington, DC, 22. februar 2016, https://www.cnas.org/publications/reports/red-alert-the-growing-threat-to-u-s-aircraft-carriers. Džeri Hendriks, „Retreat from Range: The Rise and Fall of Carrier Aviation", Center for a New American Security, Washington, DC, 19. oktobar 2015, https://www.cnas.org/publications/reports/retreat-from-range-the-rise-and-fall-of-carrier-aviation.

87 **Zagovornici moći na morima u Kongresu mimo Ratne mornarice:** Sem LaGron, „Compromise Defense Bill Restricts Navy UCLASS Funds", *USNI News,* 3. decembar 2014, https://news.usni.org/2014/12/03/compromise-defense-bill-restricts-navy-uclass-funds. Sem LaGron, „McCain Weighs in on UCLASS Debate, Current Navy

Requirements 'Strategically Misguided,' "*USNI News*, 24. mart 2015, https://news.usni.org/2015/03/24/mccain-weighs-in-on-uclass-debate-current-navy-requirements-strategically-misguided.

87 **Ratna mornarica odlaže sve planove za budući BBV:** Sidni Dž. Fridburg, Ml., „Navy Hits Gas On Flying Gas Truck, CBARS: Will It Be Armed?" *Breaking Defense*, 11. mart 2016, http://breakingdefense.com/2016/03/navy-hits-gas-on-flying-gas-truck-cbars-will-it-be-armed/.

88 **dobaci samo do 67 nautičkih milja:** 67 nautičkih milja je 124 kilometra.

88 **može da preleti do 500 nautičkih milja:** 500 nautičkih milja je 930 kilometara.

88 **tri članka u *Njujork tajmsu*:** Džon Markof, „Fearing Bombs That Can Pick Whom to Kill", *New York Times,* 11. novembar 2014, http://www.nytimes.com/2014/11/12/science/weapons-directed-by-robots-not-humans-raise-ethical-questions.html?_r=0. John Markoff, „Report Cites Dangers of Autonomno Weapons", *New York Times,* 26. februar 2016, http://www.nytimes.com/2016/02/29/technology/report-cites-dangers-of-autonomous-weapons.html. John Markoff, „Arms Controle Groups Urge Human Controle of Robot Weaponry", *New York Times,* 11. april 2016, http://www.nytimes.com/2016/04/12/tehnologija/arms-control-groups-urge-human-controle-of-robot-weaponry.html.

88 „**veštačku inteligenciju izvan ljudske kontrole":** Markof, „Fearing Bombs That Can Pick Whom to Kill."

88 **„trka u naoružavanju autonomnim oružjem":** Ibid.

88 „**DPBP primenjuje precizno trasiranje i navođenje":** *Lokid Martin,* „Long Range Anti-Ship Missile", http://www.lockheedmartin.com/us/products/LRASM/overview.html (accessed on May 15, 2017).

89 ***Lokidov* opis DPBP:** *Lokid Martin*, „Long Range Anti-Ship Missile", od 20. oktobra 2014, https://web.archive.org/web/20141020231650/http://www.lockheedmartin.com/us/products/LRASM.html.

89 „**Sposobnost poluautonomnog navođenja bezbedno dovodi DPBP":** *Lokid Martin*, „Long Range Anti-Ship Missile", od 16. decembra 2014, https://web.archive.org/web/20141216100706/http://www.lockheedmartin.com/us/products/LRASM.html.

89 **na internet i video koji objašnjava funkcionalnost DPBP:** Ovaj video nije više dostupan na sajtu *Lokid Martina*. *Lokid Martin*, „LRASM: Long Range Anti-Ship Missile", objavljeno 3. maja

2016, arhivirano 15. decembra 2016, https://web.archive.org/web/20160504083941/https://www.youtube.com/watch?v=6eFG-PIg05q0&gl=US&hl=en.

94 **pisac udžbenika:** Stjuart Rasel i Piter Norvig, *Artificial Intelligence: A Modern Approach,* 3. izdanje (Boston: Pearson, 2009).

94 „**ofanzivnog autonomnog oružja bez značajne ljudske kontrole“:** „Autonomous Weapons: An Open Letter From AI & Robotics Researchers“, Future of Life Institute, https://futureoflife.org/open-letter-autonomous-weapon/.

95 „**Sada je za timove izazov to“:** DARPA, „FLA Program Takes Flight“, DARPA.mil, 12. februar 2016, http://www.darpa.mil/news-events/2016-02-12.

96 **„BLA tehnologije mogle bi da budu posebno korisne“:** Ibid.

96 **Li je objasnio:** Danijel Li, imejl autoru, 3. jun 2016.

96 **„lokalizovanja, mapiranja, otkrivanja prepreka“:** Ibid.

96 „**primene u pretrazi i spasavanju“:** Vidžej Kumar, imejl autoru, 3. jun 2016.

97 „**nagoveštavaju upotrebu“:** Stjuart Rasel, „Take a Stand on AI Weapons“, Nature.com, 27. maj 2015, http://www.nature.com/news/robotics-ethics-of-artificial-intelligence-1.17611.

97 **nije „jasno usmerena samo na“:** Stjuart Rasel, intervju, 23. jun 2016.

97 **„Možete napraviti male, smrtonosne kvadkoptere“:** Ibid.

98 **„ako želite da razvijate autonomno oružje“:** Ibid.

98 **„svakako bi morao dobro da razmisli“ da li bi na tome radio:** Ibid.

98 „**kolaborativne autonomije – sposobnosti grupa“:** DARPA, „Collaborate Operations in Denied Environments“, DARPA.com, http://www.darpa.mil/program/collaborative-operations-in-denied-environment.

99 „**baš kao što vukovi love u koordinisanim čoporima“:** DARPA, „Establishing the CODE for Unmanned Aircraft to Fly as Collaborative Teams“, DARPA.com .http://www.darpa.mil/news-events/2015-01-21.

99 **„višestruke bespilotne letelice osposobljene KONOM“:** Ibid.

99 **Grafika na sajtu DARPA:** DARPA, „Collaborate Operations in Denied Environments.“

99 **„neprijateljska elektromagnetna okruženja“:** Ibid.

99 **metode… u prikrivenoj komunikaciji:** Sejler, „Talk Stealthy to Me.“ Amy Butler, „5th-To-4th Gen Fighter Comms Competition Eyed

In Fiscal 2015“,*A WIN First,* 18. jun 2014, http://aviationweek.com/defense/5th-4th-gen-fighter-comms-competition-eyed-fiscal-2015.

100 **u telefonskom modemu od 56K:** DARPA, „Broad Agency Announcement: Collaborative Operations in Denied Environment (CODE) Program“, DARPA-BAA-14-33, 25. april 2014, 13, dostupno na adresi https://www.fbo.gov/index?s=opportunity&mode=form&id=2f2733be59230cf2ddaa46498fe5765a&tab=core&_cview=1.

100 „**pod nadzornom kontrolom jedne osobe“:** DARPA, „Collaborative Operations in Denied Environment.“

100 **Video postavljen na internet u maju 2016:** DARPA, „Collaborative Operations in Denied Environment (CODE): Test of Phase 1 Human-SystemInterface“, https://www.youtube.com/watch?v=o-8AFuiO6ZSs&feature=youtu.be.

102 **pod nadzorom ljudskog zapovednika:** DARPA, „Collaborative Operations in Denied Environment (CODE): Phase 2 Concept Video“, https://www.youtube.com/watch?v=BPBuE6fMBnE.

102 **Na sajtu KONO stoji:** DARPA, „Collaborative Operations in Denied Environment.“

102 „**Obezbedite koncizan, ali iscrpan čipset“:** DARPA, „Broad Agency Announcement: Collaborative Operations in Denied Environment (CODE) Program“, 10.

103 „**Autonomni i poluautonomni sistemi naoružanja biće projektovani“:** Ministarstvo odbrane, „Department of Defense Directive Number 3000.09: Autonomy in WeaponSystems“,21. novembar 2012, http://www.dtic.mil/whs/directives/corres/pdf/300009p.pdf, 2.

103 **odobrenje za izgradnju i primenu autonomnog oružja:** Ibid, 7–8.

103 „**obezbeđenje multimodalnih senzora“:** DARPA, „Broad Agency Announcement: Collaborative Operations in Denied Environment (CODE) Program“, 6.

105 **Stjuart Rasel je rekao da njega ti projekti zabrinjavaju:** Stjuart Rasel, intervju, 23. jun 2016.

5 Unutar Palate zagonetki: Gradi li Pentagon autonomno oružje?

107 **s klingonskom Grabljivicom:** Bob Vork, „Remarks at the ACTUV 'Seahunter' Christening Ceremony“, 7. april 2016, https://www.defense.gov/News/Speeches/Speech-View/Article/779197/remarks-at-the-actuv-seahunter-christening-ceremony/.

107 **„ratna lađa“:** Ibid.

107 **„Možete zamisliti predstraže u ratovanju protiv podmornica“:** Ibid.

109 „**Naš osnovni posao“:** Bredford Tusli, intervju, 27. april 2016.

109 **„Ta konačna odluka je na ljudima, i tačka“:** Ibid.

109 **„Sve dok mašinski procesori ne budu jednaki ili dok ne prevaziđu“:** Ibid.

109 **„Grupe platformi koje su bespilotne“:** Ibid.

110 **„Koristimo fizičke mašine i elektroniku“:** Ibid.

110 **„Kako se ljudi uzdižu do višeg nivoa“:** Ibid.

111 **„Očekujemo da bude ometanja“:** Ibid.

111 **„Mislim da će ta odluka zavisiti od pravila ratovanja“:** Ibid.

112 **„Ako [KONO] omogući softver“:** Ibid.

113 „**U okruženju s mnogo meta“:** DARPA, „Target Recognition and Adaptation in Contested Environments“, http://www.darpa.mil/program/trace.

114 „**razvoj algoritama i tehnika“:** DARPA, „Broad Agency Announcement: Target Recognition and Adaptation in Contested Environments (TRACE)“, DARPA-BAA-15-09, 1. decembar 2014, 6, https://www.fbo.gov/index?s=opportunity&mode=form&id=087d9fba51700a89d154e8c9d9fdd93d&tab=core&_cview=1.

117 ***Duboke* neuronske mreže:** Aleks Križevski, Ilaja Sutskever i Džefri E. Hinton, *„ImageNet Classification with Deep Convolutional Neural Networks“, https://papers.nips.cc/paper/4824-imagenet-classification-with-deep-convolutional-neural-networks.pdf.*

117 **i više od stotinu slojeva:** Kristijan Zegediidr., „Going Deeper With Convolutions“, https://www.cs.unc.edu/~wliu/papers/GoogLeNet.pdf.

117 **stopu greške od samo 4,94 procenta:** Ričard Ekel, „Microsoft Researchers' Algorithm Sets ImageNet Challenge Milestone“, Microsoft Research Blog, 10. februar 2015, https://www.microsoft.com/en-us/research/microsoft-researchers-algorithm-sets-imagenet-challenge-milestone/. Kaiming He et al., „Delving Deep into Rectifiers: Surpassing Human-Level Performance on ImageNet Classification“, https://arxiv.org/pdf/1502.01852.pdf.

117 **čija je stopa greške bila procenjena na 5,1 procenat:** Olga Rusakovski i dr., „ImageNet Large Scale Visual Recognition Challenge“, 20. januar 2015, https://arxiv.org/pdf/1409.0575.pdf.

117 **sa stopom greške od 3,57 procenata:** Kjiming Hii dr., „Deep Residual Learning for Image Recognition“, 10. decembar 2015, https://arxiv.org/pdf/1512.03385v1.pdf.

6 Prelazak preko praga: Odobravanje autonomnog oružja

119 **skiciranje tri klase sistema:** Ministarstvo odbrane, „Department of Defense Directive Number 3000.09.“

120 **„minimalizuje verovatnoća i posledice“:** Ibid, 1.

121 **„Nismo imali ništa ni blizu“:** Frenk Kendal, intervju, 7. novembar 2016.

122 **„Imali smo automatski režim“:** Ibid.

122 **„relativno brzo“:** Ibid.

122 **„da sve to raščivijamo“:** Ibid.

122 **„Da li samo vozite ulicom“:** Ibid.

123 **„druga strana jednačine.“:** Ibid.

123 **„da je razborito postaviti to pitanje“:** Ibid.

123 **„u kojoj ga tehnologija podržava“:** Ibid.

123 **„principe i poštovati ih“:** Ibid.

123 **„Automatizacija i veštačka inteligencija jedna su“:** Ibid.

124 **objasnio je Vork u monografiji iz 2014:** Robert O. Vork iŠon Brimli, „20YY: Preparing for War in the Robotic Age“, *Center for a New American Security*, januar 2014, 7–8, http://www.cnas.org/sites/default/files/publications-pdf/CNAS_20YY_WorkBrimley.pdf.

126 „**Mi nećemo davati smrtonosna ovlašćenja“:** Bob Vork, koga je intervjuisao Dejvid Ignacijus, „Securing Tomorrow“, 30. mart 2016, https://static.dvidshub.net/media/video/1603/DOD_103167280/DOD_103167280-512x288-442k.mp4. Komentari na temu autonomije počinju oko 29:00.

127 **„Mogli bismo da se sukobimo sa“:** Ibid.

127 „**naši mogući konkurenti to možda ne rade“:** Bob Work, koga je intervjuisao Augut Kol, „Global Strategy Forum“, Atlantic Council, http://www.atlanticcouncil.org/events/webcasts/2016-global-strategy-forum. Komentari počinju oko 38:00.

128 „**Mi, Sjedinjene Države, imamo“:** Bob Vork, intervju, 22. jun 2016.

129 **„Krećemo se prema svetu“:** Ibid.

129 **„Ljude zabrinjava“:** Ibid.

129 **„I doći ćemo upravo do iste one odluke koju imamo sada.“:** Ibid.

130 **„Koliko ste komotni po pitanju grešaka u lociranju meta“:** Ibid.

130 **„Čujem da ljudi kažu“:** Ibid.

130 **Vork je uporedio te uske VI sisteme:** Ibid.

131 **„Ljudi će koristiti VI“:** Ibid.

132 **Šuet mi je jasno stavio do znanja:** Leri Šuet, intervju, 5. maj 2016.

133 **„čovek pritisne dugme“:** Ibid.

133 **„Istorija je puna inovacija“:** Ibid.

133 **„Vodili smo ranije te rasprave“:** Ibid.

134 „**PROTIV JAPANA PRIMENITE“:** Džoel Ajra Holvit, „ 'EXECUTE AGAINST JAPAN': Freedom-of-the-Seas, The U.S. Navy, Fleet Submarines, and the U.S. Decision to Conduct Unrestricted Submarine Warfare, 1919–1941“, disertacija, Ohio State University, 2005, https://etd.ohiolink.edu/rws_etd/document/get/osu1127506553/inline.

134 **„Je li osmi, ili šesti decembar?“:** Leri Šuet, intervju, 5. maj 2016.

7 Svetski rat R: Robotsko oružje širom sveta

135 „**Sve veći broj zemalja“:** Sjedinjene Države, Ujedinjeno Kraljevstvo, Izrael, Kina, Nigerija, Iran, Irak, Jordan, Egipat, Ujedinjeni Arapski Emirati, Saudijska Arabija, Kazahstan, Turkmenistan, Pakistan, Mjanmar, Turska. Furman i Horovic, „Droning On: Explaining the Proliferation of Unmanned Aerial Vehicles.“

136 **Čak su se i šiitske milicije u Iraku:** Dejvid Eks, „An Iraqi Shi'ite Militia Now Has Ground Combat Robots“, *War Is Boring*, 23. mart 2015, https://warisboring.com/an-iraqi-shi-ite-militia-now-has-ground-combat-robots-68ed69121d21#.hj0vxomjl.

136 **naoružani bespilotni čamac, Zaštitnik:** Bernis Bejker, „No Hands on Deck–Arming Unmanned Surface Vessels“, naval-technology.com, 23. novembar 2012, http://www.naval-tehnologija.com/features/featurehands-on-deck-armed-unmanned-surface-vessels/.

136 **Singapur je kupio Zaštitnik:** „Protector Unmanned Surface Vessel, Israel“, naval-technology.com, http://www.naval-tehnologija.com/projects/protector-unmanned-surface-vehicle/.

136 **ESGRUM:** „BAE ESGRUM USV“, NavalDrones.com, http://www.navaldrones.com/BAE-ESGRUM.html.

137 **Samo su dvadeset dve države rekle da podržavaju:** Kampanja za sprečavanje robota ubica, „Country Views on Killer Robots", 16. novembar 2017, http://www.stopkillerrobots.org/wp-content/uploads/2013/03/KRC_CountryViews_16Nov2017.pdf.

137 **Tu spadaju Taranis iz Ujedinjenog Kraljevstva:** Nikolas de Laringa, „France Begins Naval Testing of Neuron UCAV", IHS Jane's Defence Weekly, 19. maj 2016; arhivirano athttps://web.archive.org/web/20161104112421/http://www.janes.com/article/60482/france-begins-naval-testing-of-neuron-ucav. „New Imagery Details Indian Aura UCAV", *Aviation Week & Space Technology,* 16. jul 2012, http://aviationweek.com/awin/new-imagery-details-indian-aura-ucav. „Israel Working on Low-Observable UAV", Flight Global, 28. novembar, 2012, https://www.flightglobal.com/news/articles/israel-working-on-low-observable-uav-379564/.

137 **šačica zemalja već poseduje potpuno autonomnu Harpiju:** Tamir Ešel, „IAI Introduces New Loitering Weapons for Anti-Radiation, Precision Strike."

138 „**konačnu odluku o otvaranju vatre":** Džin Kumagaj, „A Robotic Sentry For Korea's Demilitarized Zone",*IEEE Spectrum: Tehnologija, Engineering, and Science News*, 1. mart 2007, http://spectrum.ieee.org/robotics/military-robots/a-robotic-sentry-for-koreas-demilitarized-zone.

138 **SGR-A1 su kao primer:** Kristofer Mojer, „How Google's AlphaGo Beat a Go World Champion", *The Atlantic*, 28. mart 2016, https://www.theatlantic.com/tehnologija/archive/2016/03/the-invisible-opponent/475611/. Adrien Džefris, „Should a Robot Decide When to Kill?", *The Verge*, 28. januar 2014, https://www.theverge.com/2014/1/28/5339246/war-mašine-ethics-of-robots-on-the-battlefield. „Future Tech? Autonomous Killer Robots Are Already Here", *NBC News*, 16. maj 2014, http://www.nbcnews.com/tech/security/future-tech-autonomous-killer-robots-are-already-here-n105656. Šeron Vajnberger, „Next Generation Military Robots Have Minds of Their Own", pristup 18. juna 2017, http://www.bbc.com/future/story/20120928-battle-bots-think-for-themselves. „The Scariest Ideas in Science", *Popular Science*, pristup 18. juna 2017, http://www.popsci.com/scitech/article/2007-02/scariest-ideas-science.

138 „**ZAŠTO, POBOGU? ZAŠTO?":** „The Scariest Ideas in Science."

138 **navodili su SGR-A1 kao potpuno autonomno:** Ronald C. Arkin, *Governing Lethal Behavior in Autonomous Robots* (Boca Raton, FL:

Taylor & Francis Group, 2009), 10. Patrik Lin, Džordž Beki i Kit Abni, „Autonomous Military Robotics: Risk, Ethics, and Design", California Polytechnic State University, San Luis Obispo, CA, 20. decembar 2008, http://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1001&context=phil_fac; Hin-Yan Liu, „Categorization and legality of autonomous and remote weaponssystems", *International Review of the Red Cross* 94, no. 886 (Leto 2012), https://www.icrc.org/eng/assets/files/review/2012/irrc-886-liu.pdf.

138 **Godine 2010, *Samsungov* portparol:** „Machine Gun-Toting Robots Deployed on DMZ", *Stars and Stripes*, 12. jul 2010, https://www.stripes.com/machine-gun-toting-robots-deployed-on-dmz-1.110809.

139 **„SGR-1 može da sprečava ratove i to će i činiti":** Ibid.

139 **kritičara koji su postavili pitanje:** Markof, „Fearing Bombs That Can Pick Whom to Kill."

139 **Brimstoun ima dva primarna režima rada:** MBDA, „Brimstone 2 Data Sheet November 2015", pristup 7. juna 2017, https://mbdainc.com/wp-content/uploads/2015/11/Brimstone2-Data-Sheet_Nov-2015.pdf.

140 **„Ovaj režim omogućava ciljanje bez obzira na vremenske uslove":** Ibid.

140 „**može da identifikuje, prati i zaključa se":** Dejvid Hembling, „The U.K. Fights ISIS With a Missile the U.S. Lacks", *Popular Mechanics*, 4. decembar 2015, http://www.popularmechanics.com/military/weapons/a18410/brimstone-missile-uk-david-cameron-isis/.

141 **„U maju 2013, više projektila tipa Brimstoun":** MBDA, „Brimstone 2 Data Sheet."

141 **zvaničan domet vi[e od 20 kilometara:** „Dual-Mode Brimstone Missile Proves Itself in Combat", *Defense Media Network*, 26. april 2012, http://www.defensemedianetwork.com/stories/dual-mode-brimstone-missile-proves-itself-in-combat/.

141 **Brimston može da napadne te mete:** Zahvalan sam firmi *MBDA Missile Systems* za to što je pristala na intervju o istorijatu 2016. i razgovor o funkcionalnosti Brimstouna.

143 „**1. Taranis će doći do oblasti za pretragu":** *BAE Systems*, „Taranis: Looking to the Future", http://www.baesistems.com/en/download-en/20151124120336/1434555376407.pdf.

144 **predsednik *BAE* Rodžer Kar:** ser Rodžer Kar, „What If: Robots Go to War? – World Economic Forum Annual Meeting 2016 | World

Economic Forum", video, pristup 7. juna 2017, https://www.weforum.org/events/world-economic-forum-annual-meeting-2016/sessions/what-if-robots-go-to-war.

144 „**odluke o aktiviranju smrtonosnog mehanizma":** Džon Ingam, „WATCH: Unmanned Test Plane Can Seek and Destroy Heavily Defended Targets", Express.co.uk, 9. jun 2016, http://www.express.co.uk/news/uk/678514/WATCH-Video-Unmanned-test-plane-Taranis.

144 **„UK ne poseduje":** UK Ministry of Defence, „Defence in the Media: 10 June 2016", 10. jun 2016, https://modmedia.blog.gov.uk/2016/06/10/defence-in-the-media-10-june-2016/.

144 „**mora biti sposoban da postigne":** UK Ministry of Defence, „Joint Doctrine Note 2/11: The UK Approach to Unmanned Aircraft Systems",30. mart 2011, https://www.gov.uk/government/uploads/sistem/uploads/attachment_data/file/33711/20110505JDN_211_UAS_v2U.pdf, 2-3.

145 **„Kako se računarske i senzorske sposobnosti uvećavaju":** Ibid, 2–4.

146 **sa samo jednim kratkotrajnim pokušajem tokom Iračkog rata:** „The Inside Story of the SWORDS Armed Robot 'Pullout' in Iraq: Update", *Popular Mechanics*, 1. oktobar 2009, http://www.popularmechanics.com/tehnologija/gadgets/4258963.

147 „**vojnim robotima dodeljen je zadatak":** Aleksandar Korolkov i specijal za RBTH, „New Combat Robot Is Russian Army's Very Own Deadly WALL-E", *Rusija Beyond The Headlines*, 2. jul 2014, https://www.rbth.com/defence/2014/07/02/new_combat_robot_is_Russian_armys_very_own_deadly_wall-e_37871.html.

147 **„Platforma M… se koristi":** Ibid.

147 **video-snimci ruskih robota prikazuju kako vojnici:** Ovaj video (https://www.youtube.com/watch?v=RBi977p0plA) više nije dostupan na internetu.

149 **Po rečima Dejvida Hemblinga iz *Popjular mekeniksa*:** Dejvid Hembling, „Check Out Rusija's Fighting Robots", *Popular Mechanics*, 12. maj 2014, http://www.popularmechanics.com/tehnologija/military/robots/Rusija-wants-autonomous-fighting-robots-and-lots-of-them-16787165.

150 **Amfibija Argo:** „Battle Robotic complex 'Argo'–Military Observer", pristup 7. juna 2017, http://warsonline.info/bronetechnika/boevoy-robotizirovanniy-kompleks-argo.html.

150 **Slike na internetu prikazuju ruske vojnike:** Tamir Ešel, „Russian Military to Test Combat Robots in 2016", Defense Update, 31. decembar 2015, http://defense-update.com/20151231_Rusijan-combat-robots.html.

150 **usporeni snimci Urana-9 koji ispaljuje protivtenkovske projektile:** Rosoboronexport, *Combat Robotic Sistem Uran-9*, n.d., https://www.youtube.com/watch?v=VBC9BM4-3Ek.

151 **Uran-9 mogao bi savremeno bojište da pretvori u smrtonosno mesto:** Rič Smit, „Rusija's New Robot Tank Could Disrupt the International Arms Market", *The Motley Fool*, 7. februar 2016, https://www.fool.com/investing/general/2016/02/07/Russias-new-robot-tank-could-disrupt-international.aspx.

151 **Vikhr… „automatski prati metu":** Sajmon Holms, „Russian Army Puts New Remote-Controlled Robot Tank to Test", *Mail Online*, 29. april 2017, http://www.dailymail.co.uk/~/article-4457892/index.html.

151 **osnovnog DJI-vog modela hobi drona Spark:** „Spark", DJI.com, http://www.dji.com/spark.

152 **T-14 Armata:** Aleks Loki, „Russia Claims Its Deadly T-14 Armata Tank Is in Full Production", *Business Insider*, 17. mart 2016, http://www.businessinsider.com/Russia-claims-t14-armata-tank-is-in-production-2016-3.

152 „**Sasvim je moguće da će se budući ratovi voditi":** „Engineers Envisioned T-14 Tank 'robotization' as They Created Armata Platform", *RT International*, 1. jun 2015, https://www.rt.com/news/263757-armata-platform-remote-control/.

153 „**potpuno automatizovani borbeni modul":** „Kalashnikov Gunmaker Develops Combat Module based on Artificial Intelligence", TASS Russian News Agency, 5. jul 2017, http://tass.com/defense/954894.

153 „**Još jedan faktor koji utiče na suštinu":** Koulson, „Top Russian General Lays Bare Putin's Plan for Ukraine."

153 **zamenik ministra odbrane Bob Vork pomenuo je:** „Remarks by Defense Deputy Secretary Robert Work at the CNAS Inaugural National Security Forum",14. decembar2015, https://www.cnas.org/publications/transcript/remarks-by-defense-deputy-secretary-robert-work-at-the-cnas-inaugural-national-security-forum.

154 **kao što su neki sugerisali, da je u toku opasna trka:** Markof, „Fearing Bombs That Can Pick Whom to Kill."

154 **Političke rasprave se možda vode:** Hvala Semu Bendetu za to što mi je ukazao na tu važnu razliku.

154 **NVO sa sedištem u UK, po imenu *Član 36*:** Član 36, „The United Kingdom and Lethal Autonomous Weapon Systems", April 2016, http://www.article36.org/wp-content/uploads/2016/04/UK-and--LAWS.pdf

8 Garažni botovi: Roboti ubice iz kućne radinosti

156 **petnaestosekundni klip… jedan tinejdžer iz Konektikata:** Rik Stela, „Update: FAA Launches Investigation into Teenager's Gun--Wielding Drone Video", *Digital Trends*, 22. jul 2015, https://www.digitaltrends.com/cool-tech/man-illegally-straps-handgun-to-a--drone/.

157 **Za manje od 500 dolara:** „Spark", DJI.com.

158 **Shield AI:** „Shield AI", http://shieldai.com/

159 **donaciji dobijenoj od američke vojske:** Mark Prig, „Special Forces developing 'AI in the sky' drones that can create 3D maps of enemy lairs: Pentagon reveals $1m secretive 'autonomno tactical airborne drone' project", DailyMail.com,http://www.dailymail.co.uk/sciencetech/article-3776601/Special-Forces-developing-AI-sky-drones--create-3D-maps-enemy-lairs-Pentagon-reveals-1m-secretive-autonomno-tactical-airborne-drone-project.html.

160 **„Robotika i veštačka inteligencija sada su":** Brendon Ceng, imejl autoru, 17. jun 2016.

162 **„potpuno automatizovanog borbenog modula":** „Kalashnikov Gunmaker Develops Combat Module based on Artificial Intelligence."

163 **U igri *go* postoji više mogućih pozicija:** „AlphaGo", *DeepMind*, pristup 7. juna 2017, https://deepmind.com/research/alphago/.

163 **„Cilj nam je bio da pobedimo najbolje ljudske igrače":** „AlphaGo: Using Machine Learning to Master the Ancient Game of Go",*Google*, 27. januar 2016, http://blog.google:443/topics/machine-learning/alphago-machine-learning-game-go/.

163 **Tokom druge partije, u 37. potezu:** Daniel Estrada, „Move 37! Lee Sedol vs AlphaGo Match 2" video, https://www.youtube.com/watch?v=JNrXgpSEEIE.

164 **„Mislio sam da je posredi greška":** Ibid.

164 „**To nije ljudski potez“:** Kejd Mec, „The Sadness and Beauty of Watching Google's AI Play Go“, *WIRED*, 11. mart 2016, https://www.wired.com/2016/03/sadness-beauty-watching-googles-ai-play-go/.

164 **1 od 10.000:** Kejd Mec, „In Two Moves, AlphaGo and Lee Sedol Redefined the Future“, *WIRED*, pristup 7. juna 2017, https://www.wired.com/2016/03/two-moves-alphago-lee-sedol-redefined-future/.

164 „**Osećao sam se gotovo bespomoćno“:** Mojer, „How Google's AlphaGo Beat a Go World Champion.“

165 **„A *Alpha Go* nije samo'stručan' sistem“:** „AlphaGo“, 27. januar 2016.

165 **Alpha Go Zero:** „AlphaGo Zero: Learning from Scratch“, DeepMind, pristup 22. oktobra 2017, https://deepmind.com/blog/alphago=zero=learning=scratch/.

165 **neuronske mreže naučile su da se igraju na Atariju:** Volodimir Mnih i dr., „Human-Level Control through Deep Reinforcement Learning“, *Nature* 518, br. 7540 (26. februar 2015): 529–33.

165 **duboka neuronska mreža:** JASON, „Perspectives on Research in Artificial Intelligence and Artificial General Intelligence Relevant to DoD.“

166 **Inception-v3:** Inception-v3 je obučena za Izazov vizuelnog prepoznavanja velikih razmera (IVPVR) korišćenjem podataka iz 2012. „Image Recognition“, *Tensor Flow*, pristup 7. juna 2017, https://www.tensorflow.org/tutorials/image_recognition.

166 **jednu od 1.000 kategorija:** Kategorije dostupne za Inception-v3 su one iz Izazova vizuelnog prepoznavanja velikih razmera (IVPVR) 2012, koji je isti kao iIVPVR 2014. „ImageNet Large Scale Visual Recognition Competition 2014 (ILSVRC2014)“, pristup 7. juna http://image-net.org/challenges/LSVRC/2014/browse-synsets.

166 **baza podataka *Pascal Visual Object Classes*:** „The PASCAL Visual Object Classes Challenge 2012 (VOC2012)“, pristup 7. juna 2017, http://host.robots.ox.ac.uk/pascal/VOC/voc2012/index.html.

167 **robotsko takmičenje FIRST:** „FIRST Robotics Competition 2016 Season Facts“, FirstInspires.org, http://www.firstinspires.org/sites/default/files/uploads/resource_library/frc-2016-season-facts.pdf.

171 **„Oni mogu da programiraju praktično u čemu god“:** Čarls Dela Kvesta, intervju, 20. maj 2016.

171 **„Ono što je za mene bilo zadivljujuće“:** Ibid.

173 „**Mislim da nikada nećemo dati“:** Brendon Ceng, imejl autoru, 17. jun 2016.

9 Pomahnitali roboti: Kvar u autonomnim sistemima

177 **22. mart 2003:** Ovo je ispričano na osnovu zvaničnih javnih podataka o bratoubistvu, uključujući istragu vlade UK u vezi s bratoubistvom Tornada i izveštaj Odbrambene naučne komisije o oba incidenta. Zasniva se takođe, delimično, na svedočenju pojedinaca koji su bili u blizini oba incidenta i koji su tražili da ostanu nepomenuti s obzirom na to da nisu imali ovlašćenja da govore zvanično o incidentima. Ministarstvo odbrane, „Aircraft Accident to Royal Air Force Tornado GR MK4A ZG710“, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82817/maas03_02_tornado_zg710_22mar03.pdf. Defense Science Board, „Report of the Defense Science Board Task Force on Patriot Performance“, januar 2005, http://www.acq.osd.mil/dsb/reports/2000s/ADA435837.pdf.

178 **Imali su samo radio:** Ministarstvo odbrane, „Aircraft Accident to Royal Air Force Tornado GR MK4A ZG710.“

178 **do napada na obližnju bazu:** „Army: U.S. Soldier Acted Out of Resentment in Grenade Attack“, *Associated Press* (24. mart 2003), http://www.foxnews.com/story/2003/03/24/army-us-soldier-acted-out-resentment-in-grenade-attack.html.

178 **mlazni lovac Tornado GR4A:** Staff and Agencies, „’Glaring Failures’ Caused US to Kill RAF Crew“, *The Guardian*, 31. oktobar 2006, https://www.theguardian.com/uk/2006/oct/31/military.iraq.

179 **jednostavno zato što se sistem pokvario:** Britanska komisija za istragu odbacila je mogućnost da su Mejn i Vilijams namerno isključili IPN, mada nije objasnila zbog čega. U odsustvu drugih mogućih objašnjenja, zaključila je da je IPN sistem „imao kvar“. Ministarstvo odbrane, „Aircraft Accident to Royal Air Force Tornado GR MK4A ZG710“, 4–5.

179 **Njihov ekran pokazao neprijateljskog lovca na radare:** Ministarstvo odbrane, „Aircraft Accident to Royal Air Force Tornado GR MK4A ZG710.“

179 **Paraboličnu putanju:** Ovo je otprilike. Lior M. Burko i Ričard H. Prajs, „Ballistic Trajectory: Parabola, Ellipse, or What?“,17. maj 2004, https://arxiv.org/pdf/physics/0310049.pdf.

180 **Tornadov IPN signal:** Postoje dva relevantna IPN režima rada koji su mogli da spreče bratoubistvo Tornada, Režim 1 i Režim 4. Režim 4 je standardni enkriptovani vojni IPN koji koristi koaliciona letelica na bojištu. On je testiran na Tornadu pre pokretanja motora na tlu i ustanovljeno je da je funkcionalan, ali nema dokaza da je on emitovao signal tokom leta. Razlozi za to nisu jasni. Režim 1 je nekriptovani režim koji sve koalicione letelice treba da koriste kao rezervu. Izveštaj britanske istrage ne navodi da li je taj režim emitovao ili nije. U svakom slučaju, baterija Patriota nije imala kodove za Režim 1, tako da nije mogla ni u kom slučaju da primi signal Režima 1. Verovatno je to zato što njihova oprema nije bila interoperativna tako da nisu bili na mreži. Kodovi Režima 1 morali su da se ručno dostave kako bi se učitali, i to očigledno nije bilo urađeno. Ministarstvo odbrane, „Aircraft Accident to Royal Air Force Tornado GR MK4A ZG710."

180 **Imali su nekoliko sekundi da donesu odluku:** Džon K. Holi, „Looking Back at 20 Years of MANPRINT on Patriot: Observations and Lessons", Army Research Laboratory, septembar, 2007, 7, http://www.dtic.mil/docs/citations/ADA472740.

180 **lovac koji je bio u pratnji Mejnovog i Vilijamsovog sleteo je u Kuvajt:** Stjuart Pejn, „US Colonel Says Sorry for Tornado Missile Blunder", 25. mart 2003, http://www.telegraph.co.uk/news/worldnews/middleeast/iraq/1425545/US-colonel-says-sorry-for-Tornado-missile-blunder.html.

182 **Posada Patriota ostala je nepovređena:** „F-16 Fires on Patriot Missile Battery", *Associated Press*, 25. mart 2003, http://www.foxnews.com/story/2003/03/25/f-16-fires-on-patriot-missile-battery.html.

184 **Dva projektila PAC-3 lansirana su automatski:** Pamela Hes, „Feature: The Patriot's Fratricide Record", *UPI*, pristup 7. juna 2017, http://www.upi.com/Feature-The-Patriots-fratricide-record/63991051224638/. „The Patriot Flawed?", 24. april 2003, http://www.cbsnews.com/news/the-patriot-flawed-19-02-2004/.

184 **mlazni lovac američke Ratne mornarice F/A-18C Stršljen:** Ibid.

184 **oba projektila udarila su u njegovu letelicu:** Ibid.

185 **„veoma uspešan":** Odbrambena naučna komisija procenila je učinak Patriota kao „znatno uspešan". To deluje pomalo preterano. Treba postaviti pitanje u kom trenutku stopa bratoubistava nekog sistema negira njegove operativne prednosti. Odbrambena naučna

komisija, „Report of the Defense Science Board Task Force on Patriot Performance“, 1.

185 **„neprihvatljiva“ stopa bratoubistva:** Hauli, „Looking Back at 20 Years of MANPRINT on Patriot.“

185 **za IPN je bilo utvrđeno:** Odbrambena naučna komisija, „Report of the Defense Science Board Task Force on Patriot Performance.“

186 **„bespogovornog verovanja sistemu“:** Hauli, „Looking Back at 20 Years of MANPRINT on Patriot.“

186 **„neutemeljenu i nekritičku veru“:** Džon K. Hauli, „Not by Widgets Alone: The Human Challenge of Technology-intensive Military Sistems“, *Armed Forces Journal*, 1. februar 2011, http://www.armedforcesjournal.com/not-by-widgets-alone/.Patriot operators now train on this and other similar scenarios to avoid this problem of unwarranted trust in the automatization.

187 **više od 30.000 ljudi godišnje:** „Accidents or Unintentional Injuries“, Centers for Disease Control and Prevention, http://www.cdc.gov/nchs/fastats/accidental-injury.htm.

187 **usavršeniji autopiloti u vozilima:** Na primer „Intelligent Drive“, Mercedes-Benz, https://www.mbusa.com/mercedes/tehnologija/videos/detail/title-safety/videoId-fc0835ab8d127410VgnVCM100000ccec1e35RCRD.

188 „**Ne, Ken je to rekao“:** Bin Keni, „Jeopardy! – The IBM Challenge (Dan 1 – 14. februar)“, video, https://www.youtube.com/watch?v=i--vMW_Ce51w.

188 **Votson nije bio programiran:** Kejsi Džonston, „Jeopardy: IBM's Watson Almost Sneaks Wrong Answer by Trebek“, *Ars Technica*, 15. februar 2011, https://arstechnica.com/media/news/2011/02/ibms-watson-tied-for-1st-in-jeopardy-almost-sneaks-wrong-answer-by-trebek.ars.

188 **„Prosto nismo mislili da će se to ikada dogoditi“:** Ibid.

190 **u smrtnom slučaju iz 2016. kada se Tesla Model S:** Ni autopilot ni vozač nisu ukočili kad se prikolica traktora pojavila ispred vozila. Andžali Singhvi i Karl Rasel, „Inside the Self-Driving Tesla Fatal Accident“, *New York Times*, 1. jul 2016, https://www.nytimes.com/interactive/2016/07/01/business/inside-tesla-accident.html. „A Tragic Loss“, 30. jun 2016, https://www.tesla.co m/blog/tragic-loss.

190 ***Čarobnjakov šegrt:*** Čarobnjakov šegrt – Fantazija, pristup 7. juna 2017, http://video.disney.com/watch/sorcerer-s-apprentice-fantasia-4ea9ebc01a74ea59a5867853.

190 **S originalnom nemačkom pesmom napisanom1797:** Johan Volfgang fon Gete, „Čarobnjakov šegrt", pristup 7. juna 2017, http://germanstories.vcu.edu/goethe/zauber_e4.html.

192 „**Tradicionalni metodi… ne uspevaju da se bave":** Kancelarija za nauku američkog Ratnog vazduhoplovstva, *Autonomno Horizons: System Autonomy in the Air Force – A Path to the Future* (jun 2015), 23, http://www.af.mil/Portals/1/documents/SECAF/AutonomnoHorizons.pdf?timestamp=1435068339702.

193 **„Videli smo to već jednom":** Zanimljivo, taj nasumični potez je možda igrao glavnu ulogu u razbijanju Kasparovljevog samopouzdanja. Za razliku od *AlphaGo* iznenadnog poteza 1 od 10.000 za koji se kasnije ispostavilo da je bio briljantan, Kasparov je odmah video da 44. potez Dip Blua nema nikakvog taktičkog smisla. Dip Blu je predao partiju jedan potez posle toga. Kasnije te večeri, dok je analizirao završne poteze, Kasparov je otkrio da je za 20 poteza mogao da matira Dip Blua. To je značilo da je Dip Blu povukao besmislen potez i predao zato što je mogao da vidi 20 poteza unapred, što je zaprepašćujuća prednost u šahu. Nejt Silver izveštava da je taj bag možda nepopravljivo uzdrmao Kasparovljevo samopouzdanje. Nejt Silver, *The Signal and the Noise: Why So Many Predictions Fail* (New York: Penguin, 2015), 276–289.

193 **nedavni izveštaj IUNIR-a o autonomnom oružju i riziku:** Institut UN za istraživanje razoružanja, „Safety, Unintentional Risk and Accidents in the Weaponization of Increasingly Autonomous Technologies", 2016, http://www.unidir.org/files/publications/pdfs/safety-unintentional-risk-and-accidents-en-668.pdf. (Bio sam učesnik radionice čiji je domaćin bio IUNIR, što je doprinelo ovom projektu, i govorio sam na panelu čiji je IUNIR bio domaćin 2016.)

194 **„S veoma kompleksnim tehnološkim sistemima":** Džon Bori, intervju, 12. april 2016.

194 **„Zašto bi autonomni sistemi bili iole drugačiji?":** Ibid.

195 **Incident na Ostrvu Tri milje:** Ovaj opis je preuzet iz Čarlsa Peroua, *Normal Accidents: Living with High-Risk Technologies* (Princeton, NJ: Princeton University Press, 1999), 15–31; i Nuklearne regulatorne komisije Sjedinjenih Država, „Backgrounder on the Three Mile Island Accident", https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html.

198 ***Apolo 13**: Za veoma kratak opis incidenta, pogledajte National Aeronautics and Space Administration, „Apollo 13", https://www.nasa.*

gov/mission_pages/apollo/missions/apollo13.html. Nasin pun izveštaj o katastrofi s Apolom 13 može se naći u National Aeronautics and Space Administration, *„Report of the Apollo 13 Review Board", 15. jun 1970, http://nssdc.gsfc.nasa.gov/planetary/lunar/apollo_13_review_board.txt. Videti takođe* Perou, Normal Accidents, *271–281.*

198 **Čelindžer (1986) i Kolumbija (2003)**: *Za* Čelindžer *videti* National Aeronautics and Space Administration, *„Report of the Presidential Commission on the Space Shuttle Challenger Accident", 6. jun 1986, http://history.nasa.gov/rogersrep/51lcover.htm. Za nesreću s* Kolumbijom *videti* National Aeronautics and Space Administration, *„Columbia Accident Investigation Board, Volume 1", avgust 2003, http://spaceflight.nasa.gov/shuttle/archives/sts-107/investigation/CAIB_medres_full.pdf.*

198 **„niko nikada nije nai[ao u istoriji raketarstva":** Mat Bardžis, „Elon Musk Confirms SpaceX's Falcon 9 Explosion Was Caused by 'Frozen Oxygen,' „*WIRED*, 8. novemba, 2016, http://www.wired.co.uk/article/elon-musk-universal-basic-income-falcon-9-explosion. „Musk: SpaceX Explosion Toughest Puzzle We've Ever Had to Solve",*CNBC*, video pristup7. juna 2017, http://video.cnbc.com/gallery/?video=3000565513.

198 **Fukušima Dajči:**Filip J. Lipski, Kenđi E. Kušida i Trevor Inčerti, „The Fukushima Disaster and Japan's NuclearPlant Vulnerability in Comparative Perspective", *Environmental Science and Technology* 47 (2013), http://web.stanford.edu/~plipscy/LipscyKushidaIncerti-EST2013.pdf.

200 **„Značajna poruka za":** Vilijam Kenedi, intervju, 8. decembar 2015.

200 **„gotovo nikada ne aktiviraju individualno":** Ibid.

200 **„Automatizovani sistemi":** Ibid.

200 **„Obe strane imaju svoje snage i slabosti":** Ibid.

201 **Lovac F-16:** Gaj Noris, „Ground Collision Avoidance Sistem 'Saves' First F-16 In Syria", 5. februar 2015, http://aviationweek.com/defense/ground-collision-avoidance-sistem-saves-first-f-16-syria.

201 **softverski zasnovane granice u kontrolama letenja:** Den Kanin, „Semper Lightning: F-35 Flight ControlSistem", Code One, 9. decembar 2015, http://www.codeonemagazine.com/f35_article.html?item_id=187.

202 **softver s milionima linija koda:** Robert N. Šaret, „This Car Runs on Code", *IEEE Spectrum: Technology, Engineering,and Science News*,

1. februar 2009, http://spectrum.ieee.org/transportation/sistems/this-car-runs-on-code. Joey Cheng, „Army Lab to Provide Software Analysis for Joint Strike Fighter",*Defense Systems*, 12. avgust 2014, https://defensesistems.com/articles/2014/08/14/army-f-35-joint--strike-fighter-software-tests.aspx. Robert N. Šaret, „F-35 Program Continues to Struggle with Software", *IEEE Spectrum: Technology, Engineering, and Science News*, 19. septembar 2012, http://spectrum.ieee.org/riskfactor/aerospace/military/f35-program-continues-to--struggle-with-software.

202 **0,1 do 0,5 grešaka u svakih 1.000 linija koda:** Stiv Makonel, *Code Complete: A Practical Handbook of Software Construction* (Redmond, WA: Microsoft Press, 2004), http://www.amazon.com/Code-Complete-Practical-Handbook-Construction/dp/0735619670.

202 **neke greške su neizbežne:** Spejs šatl je interesantan izuzetak koji potvrđuje pravilo. NASA je uspela da svede broj grešaka u kodu spejs šatla na nulu kroz radno intenzivan proces koji je angažovao timove inženjera. Međutim, spejs šatl ima otprilike samo 500.000 linija koda, i taj proces bi bio potpuno neizvodljiv za kompleksnije sisteme koji koriste milione linija koda. Lovac združenog udara F-35, na primer, ima više od 20 miliona linija koda. Čarls Fišmen, „They Write the Right Stuff", FastCompany.com, 31. decembar 1996, http://www.fastcompany.com/28121/they-write-right-stuff.

202 **mlazni lovci F-22:** Napomene general-majora Ratnog vazduhoplovstva u penziji Dona Šeparda u „This Week at War", *CNN,* 24. februar 2007, http://transcripts.cnn.com/TRANSCRIPTS/0702/24/tww.01.html.

202 **hakuju određene automobile:** Endi Grinberg, „Hackers Remotely Kill a Jeep on the Highway – With Me in It",*Wired*, 21. jul 2015, http://www.wired.com/2015/07/hackers-remotely-kill-jeep-highway/.

203 **Jedna studija korisnika Gnezda:** Rajan Jang i Mark V. Njuman, „Learning from a Learning Thermostat: Lessons for Intelligent Sistems for the Home", UbiComp'13, 8–12. septembar, 2013.

203 **„Kako sistemi postaju sve kompleksniji":** Džon Bori, intervju, 12. april 2016.

203 **let 447 *Er Fransa*:** „Final Report: On the accidents of 1st June 2009 to the Airbus A330-203 registered F-GZCP operated by Air France flight 447 Rio de Janeiro – Paris", Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile, [prevod na engleski], 2012, http://

www.bea.aero/docspa/2009/f-cp090601.en/pdf/f-cp090601.en.pdf. Vilijam Langeviše, „The Human Factor", *Vanity Fair,* oktobar 2014, http://www.vanityfair.com/news/business/2014/10/air-france--flight-447-crash. Nik Ros i Nil Tvidi, „Air France Flight 447: 'Damn it, We're Going to Crash,' *The Telegraph*, 28. april 2012, http://www.telegraph.co.uk/tehnologija/9231855/Air-France-Flight-447-Damn--it-were-going-to-crash.html.

205 **Teorija normalne nesreće baca svetlost:** U stvari, istraživači iz Kopnene vojske konkretno su naveli kako incident na Ostrvu Tri milje ima mnogo toga zajedničkog s bratoubistvima Patriota. Hauli, „Looking Back at 20 Years of MANPRINT on Patriot".

205 **„čak i kvarovi veoma male verovatnoće":** Defense Science Board, „Report of the Defense Science Board Task Force on Patriot Performance".

10 Komandovanje i odlučivanje: Može li autonomno oružje da se koristi bezbedno?

207 **letačke palube američkih nosača aviona:** Džin I. Rošlin, Tod R. La Porte i Karlin H. Roberts, „The Self-Designing High-Reliability Organization: Aircraft Carrier Flight Operations at Sea",*Naval War College Review,*jesen 1987, https://fas.org/man/dod-101/sys/ship/docs/art7su98.htm. Džin I. Rošlin, Tod R. La Porte i Karlin H. Roberts, „Aircraft Carrier Operations At Sea: The Challenges of High Reliability Performance", University of California, Berkeley, 15. jul 1988, http://www.dtic.mil/dtic/tr/fulltext/u2/a198692.pdf.

207 **Organizacije visoke pouzdanosti:** Karl E. Vik i Katlin M. Satklif, *Managing the Unexpected: Sustained Performance in a Complex World,* 3rd ed. (San Francisco: Jossey-Bass, 2015).

207 **Dok se vojske kao celine ne bi smatrale:** Skot A Snuk, *Friendly Fire: The Accidental Shootdown of U.S. Black Hawks over Northern Iraq* (Princeton, NJ: Princeton University Press, 2002).

208 **„Program SUBSAFE":** Pol E. Saliven, „Statement before the House Science Committee on the SUBSAFE Program", 29. oktobar 2003, http://www.navy.mil/navydata/testimony/safety/sullivan031029.txt.

208 **sedamdeset podmornica u svojoj floti:** Ministarstvo odbrane, „Quadrennial Defense Review 2014", http://archive.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf.

211 **„Možete ih mešati i uklapati“:** Piter Galuh, intervju, 15. jul 2016.

212 **„uništi ili budi uništen“:** Ibid.

212 **„nema napona koji bi mogao da se upotrebi“:** Ibid.

212 **„Apsolutno, automatizovana je“:** Ibid.

213 **„Nikad se ne vozikate unaokolo“:** Ibid.

214 **„svesne odluke da se otvori vatra“:** Ibid.

215 „**OKRENI NA ZELENO“:** Komanda, kako to stoji na sajtu Ratne mornarice, glasi „okreni PKP na zeleno“. Američka Ratna mornarica, „Naval Terminology“, http://www.public.navy.mil/surfor/Pages/Navy-Terminology.aspx.

217 **„strašnu, bolnu lekciju“:** Piter Galuh, intervju, 15. jul 2016.

217 **„rat tankera“:** Ronald O'Rork, „The Tanker War“, Proceedings, maj 1988, https://www.usni.org/magazines/proceedings/1988-05/tanker-war.

218 ***Iran Er* 655:** Ova pripovest potiče iz specijala ABC o incidentu s *Vensenom* koji se oslanja na intervjue iz prve ruke i video i audio snimke s *Vensena* tokom trajanja incidenta. ABC Four Corners, „Shooting Down of Iran Air 655“, 2000, https://www.youtube.com/watch?v=Onk_wI3ZVME.

220 **„neosnovane i nekritičke vere“:** Hauli, „Not by Widgets Alone.“

220 **„potrošila mnogo novca istražujući“:** Džon Hauli, intervju, 5. decembar 2016.

220 **„Ako situaciju [u obuci] učinite“:** Ibid.

220 **„u lažnom okruženju… Kopnena vojska se zavarava“:** Ibid.

220 **„dosledno objektivne reakcije“:** Ibid.

221 **„Čak i kad su pripadnici Kopnene vojske“:** Ibid.

221 **„Visoki oficiri u Aegisovoj zajednici“:** Ibid.

221 **da je ta organizacija „previše aljkava“:** Ibid.

221 **„Sudeći po istoriji“:** Ibid.

223 **traka za obuku ostavljena u kompjuteru:** Luis i dr., „Too Close for Comfort: Cases of Near Nuclear Use and Options for Policy“, The Royal Institute of International Affairs, London, April 2014, https://www.chathamhouse.org/sites/files/chathamhouse/field/field_document/20140428TooCloseforComfortNuklearnoUseLewisWilliamsPelopidasAghlani.pdf, 12–13.

223 **pokvareni kompjuterski čip:** Ibid, 13. Vilijam Bur, „The 3 A.M. Phone Call“, The National Security Archive, 1. mart 2012, http://nsarchive.gwu.edu/nukevault/ebb371/.

223 **doneli predsedniku Borisu Jeljcinu tašnu s nuklearnim komandama:** Luis, „Too Close for Comfort", 16–17.

224 **„eroziju" poštovanja:** Defense Science Board Permanent Task Force on NuclearWeapons Surety, „Report on the Unauthorized Movement of NuklearWeapons",februar 2008, http://web.archive.org/web/20110509185852/http://www.nti.org/e_research/source_docs/us/department_defense/reports/11.pdf. Richard Newton, „Press Briefing with Maj. Gen. Newton from the Pentagon, Arlington, Va.",19. oktobar 2007, http://web.archive.org/web/20071023092652/http://www.defenselink.mil/transcripts/transcript.aspx?transcriptid=4067.

224 **trinaest incidenata u kojima umalo nije upotrebljeno nuklearno oružje:** Luis, „Too Close for Comfort."

224 „**Kad sam započeo ovu knjigu":** Skot D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, NJ: Princeton University Press, 1993), 251.

224 **„Istorijski dokazi mnogo snažnije… sistemima nuklearnog naoružanja":** Ibid, 252.

225 **„imanentna ograničenja organizacione bezbednosti":** Ibid, 279.

225 **„dilemom uvek/nikad":** Ibid, 278.

225 **da je to praktično „nemoguće":** Ibid, 278.

225 **Autonomno oružje ima probleme analogne s dilemom uvek/nikad:** Posebna zahvalnost za Heder Rofna Državnom univerzitetu Arizone za to što mi je ukazala na tu paralelu.

228 **„Možete proći kroz raznorazne obuke":** Džon Hauli, intervju, 5. decembar 2016.

229 **„planiranim akcijama":** Vilijam Kenedi, intervju, 8. decembar 2015.

11 Crna kutija: Čudan, tuđinski svet dubinskih neuronskih mreža

231 **prepoznavanje objekata, s istim ili boljim rezultatima od ljudskih:** Kajming Hi i dr., „Delving Deep into Rectifiers: Surpassing Čovek-Level Performance on ImageNet Classification."

232 **Suparničke slike:** Kristijan Zegedi i dr., „Intriguing properties of neural networks", februar 2014, https://arxiv.org/pdf/1312.6199v4.pdf.

232 **koje istraživači obično namerno stvaraju:** U bar jednom slučaju, istraživači su namerno razvijali slike, ali nisu pokušavali da prevare duboku neuronsku mrežu stvaranjem slika koje su besmislene.

Istraživači su objasnili: „Pokušavali smo da proizvedemo prepoznatljive slike, ali su se pojavile ove neprepoznatljive". „Deep neural networks are easily fooled: High confidence predictions for unrecognizable images", Evolving Artificial Intelligence Laboratory, University of Wyoming, http://www.evolvingai.org/fooling. Za više tog, videti Ngujen A, Josinski Dž., Klun Dž. (2015) „Deep neural networks are easily fooled: High confidence predictions for unrecognizable images", *Computer Vision and Pattern Recognition* (CVPR '15), IEEE, 2015.

232 **konkretnu internu strukturu mreže:** Zegedi i dr., „Intriguing properties of neural networks."

234 **„ogroman, čudan, tuđinski svet slika":** Džef Klun, intervju, 28. septembar 2016.

234 **krišom usaditi u normalne slike:** Ibid.

234 **„skrivenim eksploatisanjem":** Ibid.

234 **linearne metode tumačenja podataka:** Ijan Dž. Gudfelou, Džonahan Šins i Kristijan Zegedi, „Explaining and Harnessing Adversarial Examples", 20. mart 2015, https://arxiv.org/abs/1412.6572; Ijan Dž. Gudfelou, Prezentacija na samitu Re-Work Deep Learning 2015, https://www.youtube.com/watch?v=Pq4A2mPCB0Y.

236 **„beskonačno daleko levo":** Džef Klun, intervju, 28. septembar 2016.

236 **„slike stvarnog sveta veoma, veoma mali":** Ibid.

236 **ona je prisutna suštinski u svakoj dubokoj neuronskoj mreži:** „Duboke neuronske mreže lako se mogu i prevariti." Gudfelou i dr., „Explaining and Harnessing Adversarial Examples."

236 **specijalno evoluiranu buku:** Kori Kereljuk, Bob L. Šturm i Jan Larsen, „Deep Learning and Music Adversaries", http://www2.imm.dtu.dk/pubdb/views/edoc_download.php/6904/pdf/imm6904.pdf.

236 **Berzanski botovi koji čitaju vesti:** Džon Karni, „The Trading Robots Really Are Reading Twitter", 23. april 2013, http://www.cnbc.com/id/100666302. Pati Dom, „False Rumor of Explosion at White House Causes Stocks to Briefly Plunge; AP Confirms Its Twitter Feed Was Hacked",23. april 2013, http://www.cnbc.com/id/100646197.

236 **duboke neuronske mreže kako bi razumeli tekst:** Žang Zang i Jan Le Kun, „Text Understanding from Scratch", 4. april 2016, https://arxiv.org/pdf/1502.01710v5.pdf.

237 **Tviter nalog *Asošijeted presa* hakovan:** Dom, „False Rumor of Explosion at White House Causes Stocks to Briefly Plunge; AP Confirms Its Twitter Feed Was Hacked."

238 **projektovati duboke neuronske mreže tako da ne budu ranjive:** „Deep neural networks are easily fooled."

238 **„kontraintuitivnu, čudnu" ranjivost:** Džef Klun, intervju, 28. septembar 2016.

238 **„Puka veličina, milioni ili milijarde":** JASON, „Perspectives on Research in Artificial Intelligence and Artificial General Intelligence Relevant to DoD", 28–29.

238 **„sama priroda [dubokih neuronskih mreža]":** Ibid, 28.

238 **„Kako duboko učenje postaje sve moćnije":** Džef Klun, intervju, 28. septembar 2016.

239 **„superkomplikovana, velika i čudna":** Ibid.

239 **„otrežnjujuću poruku… fatalnim i tragičnim":** Ibid.

239 „**Nije jasno da li je postojeća VI paradigma":** JASON, „Perspectives on Research in Artificial Intelligence and Artificial General Intelligence Relevant to DoD", Ibid, 27.

240 „**neintuitivne osobine":** Zegedii dr., „Intriguing Properties of Neural Networks."

240 **i mi zaista ne razumemo kako ili zašto do toga dolazi.:** Za čitljivo objašnjenje ovog šireg problema videti Dejvida Berebija, „Artificial Intelligence Is Already Weirdly Inhuman",*Nautilus*, 6. avgust 2015, http://nautil.us/issue/27/dark-matter/artificial-intelligence-is-already-weirdly-in.

12 Smrtonosne greške: Rizik autonomnog oružja

241 **„Mislim da smo preveliki optimisti":** Džon Bori, intervju, 12. april 2016.

241 **„Ako nameravate da te stvari pustite s lanca":** Džon Hauli, intervju, 5. decembar 2016.

241 **„Čak i s našim unapređenim znanjem":** Perou, *Normal Accident*s, 354.

244 **o „masakru robo-mitraljezom":** Noa Šahtman, „Inside the Robo-Cannon Rampage (Updated)", *WIRED*, 19. oktobar 2007, https://www.wired.com/2007/10/inside-the-robo/.

244 **zla sreća, a ne namerno ciljanje:** „'Robotic Rampage' Unlikely Reason for Deaths", *New Scientist*, pristup 12. juna 2017, https://www.newscientist.com/article/dn12812-robotic-rampage-unlikely-reason-for-deaths/.

244 **zasuo susedno mitraljesko gnezdo rafalom metaka kalibra 35 mm:** „Robot Cannon Kills 9, Wounds 14“, *WIRED*, pristup 12. juna 2017, https://www.wired.com/2007/10/robot-cannon-ki/.

245 **„Mašina ne zna da greši““:** Džon Hauli, intervju, 5. decembar 2016.

246 **„incidente masovne smrtonosnosti“:** Džon Bori, intervju, 12. april 2016.

246 **„Ako dovedete nekog drugog“:** Džon Hauli, intervju, 5. decembar 2016.

247 **„Na to nemam mnogo dobrih odgovora“:** Piter Galuh, intervju, 15. jul 2016.

13 Bot protiv bota: Brzinska trka u naoružavanju

251 **6. maja 2010:** U.S. Commodity Futures Trading Commission and U.S. Securities and Exchange Commission, „Findings Regarding the Market Events of May 6, 2010“, 30. septembar 2010, 2, http://www.sec.gov/news/studies/2010/marketevents-report.pdf.

251 „**užasavajući“ i „apsolutni haos“:** Tom Loričela i Piter A. Makej, „Dow Takes a Harrowing 1,010.14-Point Trip“, *Wall Street Journal*, 7. maj 2010, http://www.wsj.com/articles/SB10001424052748704370704575227754131412596. Aleksandra Tvin, „Glitches Send Dow on Wild Ride“, *CNN Money*, 6. maj 2010, http://money.cnn.com/2010/05/06/markets/markets_newyork/.

252 **Prošli su dani brokera koji u sali izvikuju cene:** D. M. Levin, „A Day in the Quiet Life of a NYSE Floor Trader“,*Fortune*, 20. maj 2013, http://fortune.com/2013/05/29/a-day-in-the-quiet-life-of-a--nyse-floor-trader/.

252 **tri četvrtine ukupne trgovine:** „Rocky Markets Test the Rise of Amateur 'Algo' Traders“, *Reuters*, 28. januar 2016, http://www.reuters.com/article/us-europe-stocks-algos-insight-idUSKCN0V61T6. Procenat trgovine koji je automatizovan varirao je tokom vremena i predmet je izvesne nesigurnosti. Procene za poslednjih nekoliko godina kreću se između 50 i 80 procenata ukupne američke trgovine hartijama od vrednosti. Washingtons Blog, „What Percenatage of U.S. Equity Trades Are High Frequency Trades?“, 28. oktobar 2010, http://www.washingtonsblog.com/2010/10/what-procenataage-of--u-s-equity-trades-are-high-frequency-trades.html.

252 **ponekad nazivana algoritamskom trgovinom:** Tom C. V. Lin, „The New Investor", SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, March 3, 2013), https://papers.ssrn.com/abstract=2227498.

252 **automatizovane trgovinske odluke o kupovini ili prodaji:** Neki pisci kod automatizovanog trgovanja hartijama od vrednosti razlikuju automatizovano trgovanje i algoritamsko trgovanje, koristeći termin algoritamsko trgovanje samo za praksu podele velikih naloga za izvršenje preko algoritma po ceni, roku ili obimu, i pominjući ostale prakse poput traženja arbitražnih prilika kao automatizovano trgovanje. Drugi tretiraju algoritamsko trgovanje i automatizovano trgovanje kao praktično sinonime.

253 **Automatizovana trgovina, međutim, nudi prednost:** Šobit Set, „Basics of Algorithmic Trading: Concepts and Examples", *Investopedia*, 10. oktobar 2014, http://www.investopedia.com/articles/active-trading/101014/basics-algorithmic-trading-concepts-and-examples.asp.

253 **treptaj oka:** „Average Duration of a Single Eye BlinkHuman Homo Sapiens–BNID 100706", pristup 12. juna 2017, http://bionumbers.hms.harvard.edu//bionumber.aspx?id=100706&ver=0.

253 **brzinama koje se mere mikrosekundama:** Majkl Luis, *Flash Boys: A Wall Street Revolt* (New York: W. W. Norton, 2015), 63, 69, 74, 81.

254 **najkraći put za svoje kablove:** Ibid, 62–63.

254 **na optimizaciji svih delova hardvera kako bi dobili u brzini:** Ibid, 63–64.

254 **testiraju na podacima sa stvarnih berzi:** D7, „Knightmare: A DevOps Cautionary Tale", *Doug Seven*, 17. april 2014, https://dougseven.com/2014/04/17/knightmare-a-devops-cautionary-tale/.

254 **„Nauka trgovine, standard poverenja.":** Džef Koks, „'Knight-Mare': Trading Glitches May Just Get Worse", 2. avgust 2012, http://www.cnbc.com/id/48464725.

255 ***Najtov* sistem trgovanja poplavio je tržište:** „Knight Shows How to Lose $440 Million in 30 Minutes", *Bloomberg.com*, 2. avgust 2012, https://www.bloomberg.com/news/articles/2012-08-02/knight-shows-how-to-lose-440-million-in-30-minutes.

255 **nisu potrudili da ugrade „prekidač za ubijanje":** D7, „Knightmare".

255 **obavio četiri miliona transakcija:** „How the Robots Lost: High-Frequency Trading's Rise and Fall", *Bloomberg.com*, 7. jun, 2013,

https://www.bloomberg.com/news/articles/2013-06-06/how-the--robots-lost-high-frequency-tradings-rise-and-fall.

255 ***Najt* je bankrotirao.:** D7, „Knightmare".

255 **„Vitezov košmar na Volstritu":** Za teoriju o onome što se dogodilo, videti Nanex Research, „03-Aug-2012 – The Knightmare Explained", http://www.nanex.net/aqck2/3525.html.

256 ***Vodel i Rid*:** *Vodel i Rid* nisu pomenuti u zvaničnom izveštaju SEC i CFTC, koji je samo pomenuo „krupnog fundamentalnog trgovca (iz kompleksa uzajamnih fondova)". U.S. Commodity Futures Trading Commission and U.S. Securities and Exchange Commission, „Findings Regarding the Market Events of May 6, 2010", 2. Međutim, više novinskih izvora identifikovalo je firmu kao *Waddell & Reed Financial Inc.* E. S. Bauning i Dženi Strazburg, „The Mutual Fund in the 'Flash Crash,' „*Wall Street Journal*, 6. oktobar 2010, http://www.wsj.com/articles/SB10001424052748704689804575536513798579500. „Flash-Crash Spotlight on Kansas Manager Avery",*Reuters*, 18. maj 2010, http://www.reuters.com/article/us-selloff-ivyasset-analysis-idUSTRE64H6G620100518.

256 ***E-miniji*:** „What Are Emini Futures? Why Trade Emini Futures?", *Emini-Watch.com*, pristup 13. juna 2017, http://emini-watch.com/emini-trading/emini-futures/.

256 **Devet procenata obima trgovanja u prethodnom minutu:** U.S. Commodity Futures Trading Commission and U.S. Securities and Exchange Commission, „Findings Regarding the Market Events of May 6, 2010", 2.

256 **nikakva uputstva u vezi s rokom ili cenom:** *Vodel i Rid*, kao i *Chicago Mercantile Exchange* osporavaju taj argument, koji su uglavnom iznele CFTF & SEC, da je velika prodaja E-minija bila faktor koji je doveo do Munjevitog kraha. Nezavisna firma za istraživanje tržišta *Naneks* na sličan način je kritikovala sugestiju da je prodajni algoritam *Vodela i Rida* doveo do kraha. „Waddell & Reed Responds to 'Flash Crash' Reports – May. 14, 2010", pristup 13. juna 2017, http://money.cnn.com/2010/05/14/markets/flash_crash_waddell_reed/. „CME Group Statement on the Joint CFTC/SEC Report Regarding the Events of May 6 – CME Investor Relations", 1. oktobar 2010, http://investor.cmegroup.com/investor-relations/releasedetail.cfm?ReleaseID=513388. „Nanex – Flash Crash Analysis – Continuing Developments", accessed 13. jun 2017, http://www.nanex.net/FlashCrashFinal/FlashCrashAnalysis_WR_Update.html.

257 **„neuobičajeno turbulentno“:** U.S. Commodity Futures Trading Commission and U.S. Securities and Exchange Commission, „Findings Regarding the Market Events of May 6, 2010“, 1.

257 **„neuobičajeno visoku nestabilnost“:** Ibid, 2.

257 **efekat „vrućeg krompira“:** Ibid, 3.

257 **27.000 E-mini ugovora:** Ibid, 3.

257 **automatizovano obezbeđenje „zaustavne logike“:** Ibid, 4.

258 **„iracionalnim cenama“:** Ibid, 5.

258 **„očigledno pogrešnih“ transakcija:** Ibid, 6.

258 **Majk Ajsen:** Majkl Ajsen, „Amazon's $23,698,655.93 book about flies“,*it is NOT junk*, 22 april 2011, http://www.michaeleisen.org/blog/?p=358.

259 **Ajsen je postavio hipotezu:** „Amazon.com At a Glance: bordeebook“, pristup 1. oktobra 2016.

259 **Navinder Sing Sarao:** Ministarstvo pravde, „Futures Trader Pleads Guilty to Illegally Manipulating the Futures Market in Connection With 2010 'Flash Crash,' „9. novembar 2016, https://www.justice.gov/opa/pr/futures-trader-pleads-guilty-illegally-manipulating-futures-market-connection-2010-flash.

260 **Namernim manipulisanjem cenom:** Ministarstvo pravde, „Futures Trader Charged with Illegally Manipulating Stock Market, Contributing to the May 2010 Market 'Flash Crash,'“ 21. april 2015, https://www.justice.gov/opa/pr/futures-trader-charged-illegally-manipulating-stock-market-contributing-may-2010-market-flash. United States District Court Northern District of Illinois Eastern Division, „Criminal Complaint: United States of America v. Navinder Singh Sarao“, 11. februar 2015, https://www.justice.gov/sites/default/files/opa/press-releases/attachments/2015/04/21/sarao_criminal_complaint.pdf.

260 **okriviti Saraoa za Munjeviti krah:** „Post Flash Crash, Regulators Still Use Bicycles To Catch Ferraris“, *Traders Magazine Online News*, pristup 13. juna 2017, http://www.tradersmagazine.com/news/tehnologija/post-flash-crash-regulators-still-use-bicycles-to--catch-ferraris-113762-1.html.

260 **obmanjujući algoritam, kako je izvešteno, bio je *isključen:*** „Guy Trading at Home Caused the Flash Crash“, *Bloomberg.com*, 21. april 2015, https://www.bloomberg.com/view/articles/2015-04-21/guy-trading-at-home-caused-the-flash-crash.

260 **da pogorša nestabilnost na tržištu E-minija:** Ministarstvo pravde, „Futures Trader Charged with Illegally Manipulating Stock Market, Contributing to the May 2010 Market 'Flash Crash,'" 21. april 2015, https://www.justice.gov/opa/pr/futures-trader-charged-illegally--manipulating-stock-market-contributing-may-2010-market-flash.

260 **„prekidače kola":** Prva tranša individualnih berzanskih prekidača kola, primenjena neposredno posle Munjevitog kraha, izazvala bi petominutnu pauzu ukoliko bi se cena akcije kretala naviše ili naniže za više od 10 procenata u prethodnih pet minuta. U.S. Commodity Futures Trading Commission and U.S. Securities and Exchange Commission, „Findings Regarding the Market Events of May 6, 2010", 7.

260 **Prekidači kola za čitavo tržište:** Pad od 7 ili 13 procenata zaustavlja trgovanje na 15 minuta. Pad od 20 procenata zaustavlja trgovanje do kraja dana.

260 **„gornja granica–donja granica":** Securities and Exchange Commission, „Investor Bulletin: Measures to Address Market Volatility", 1. jul 2012, https://www.sec.gov/oiea/investor-alerts-bulletins/investor-alerts-circuitbreakersbulletinhtm.html. Specifični rasponi cena navedeni su ovde: Investopedia Staff, „Circuit Breaker", *Investopedia*, 18. novembar 2003, http://www.investopedia.com/terms/c/circuitbreaker.asp.

261 **U prosečnom danu, pregršt prekidača kola aktivira se usled brzih promena cena.:** Morin Farel, „Mini Flash Crashes: A Dozen a Day", *CNN Money*, 20. mart 2013, http://money.cnn.com/2013/03/20/investing/mini-flash-crash/index.html.

261 **više od 1.200 prekidača kola:** Mat Egan, „Trading Was Halted 1,200 Times Monday", *CNN Money*, 24. avgust 2015, http://money.cnn.com/2015/08/24/investing/stocks-markets-selloff-circuit-breakers-1200-times/index.html. Tod C. Frankel, „Mini Flash Crash? Trading Anomalies on Manic Monday Hit Small Investors", *Washington Post*, 26. avgust 2015, https://www.washingtonpost.com/business/economy/mini-flash-crash-trading-anomalies-on-manic--monday-hit-small-investors/2015/08/26/6bdc57b0-4c22-11e5-bfb9-9736d04fc8e4_story.html?utm_term=.749eb0bbbf5b.

261 **jednostavna ljudska greška:** Džošua Džejmerson i Aruna Visvanata, „Merrill Lynch to Pay $12.5 Million Fine for Mini-Flash Crashes", *Wall Street Journal*, 26. septembar 2016, http://www.wsj.com/

articles/merrill-lynch-to-pay-12-5-million-fine-for-mini-flash-crashes-1474906677.

261 **osnovni uslovi za munjevite krahove i dalje postoje:** Bob Pisani, „A Year after the 1,000 – Point Plunge, Changes Cut Trading Halts on Volatile Days", 23. avgust 2016, http://www.cnbc.com/2016/08/23/a-year-after-the-1000-point-plunge-changes-cut-trading-halts-on-volatile-days.html.

261 **„Prekidači kola ne sprečavaju":** Farel, „Mini Flash Crashes".

262 **Incident u zalivu Tonkin:** Istoričari otad tvrde da je bilo dosta dokaza u to vreme da se navodna pomorska bitka iz 4. avgusta 1964. nikad nije ni dogodila, da je ministar odbrane Robert Maknamara namerno obmanuo Kongres kako bi se založio za rat u Vijetnamu, i da je predsednik Lindon Džonson bio svestan toga da se ta bitka nikad nije odigrala. Pat Paterson, „The Truth About Tonkin", *Naval History* magazine, februar 2008, https://www.usni.org/magazines/navalhistory/2008-02/truth-about-tonkin. John Prados, „The Gulf of Tonkin Incident, 40 Years Later", The National Security Archive, 4. avgust 2004, http://nsarchive.gwu.edu/NSAEBB/NSAEBB132/. Džon Prados, „Tonkin Gulf Intelligence 'Skewed' According to Official History and Intercepts", The National Security Archive, 1. decembar 2005. Robert Dž. Haniok, „Skunks, Bogies, Silent Hounds, and the Flying Fish: The Gulf of Tonkin Mystery, 2–4 August 1964", *Cryptologic Quarterly*, http://nsarchive.gwu.edu/NSAEBB/NSAEBB132/relea00012.pdf.

262 **„čin rata":** Den Getinger, „'An Act of War': Drones Are Testing China-Japan Relations", Center for the Study of the Drone, 8. novembar 2013, http://dronecenter.bard.edu/act-war-drones-testing-china-japan-relations/. „Japan to Shoot down Foreign Drones That Invade Its Airspace", *The Japan Times Online*, 20. oktobar 2013, http://www.japantimes.co.jp/news/2013/10/20/national/japan-to-shoot-down-foreign-drones-that-invade-its-airspace/. „China Warns Japan against Shooting down Drones over Islands", *The Times of India*, 27. oktobar 2013, http://timesofindia.indiatimes.com/world/china/China-warns-Japan-against-shooting-down-drones-over-islands/articleshow/24779422.cms.

263 **za kršenje suvereniteta obe ove zemlje:** „Kashmir Firing: Five Civilians Killed after Drone Downed", *BBC News*, 16. jul 2015, sec. India, http://www.bbc.com/news/world-asia-india-33546468.

263 **Pakistan je oborio:** „Pakistan Shoots Down Indian Drone 'Trespassing' into Kashmir", *AP News*, pristup 13. juna 2017, https://apnews.com/b67d689fb1f7410e9d0be01daaded3a7/pakistani-and-indian--troops-trade-fire-kashmir.

263 **Izrael je oborio dronove:** Gili Koen, „Israeli Fighter Jet Shoots Down Hamas Drone Over Gaza", *Haaretz*, 20. septembar 2016, http://www.haaretz.com/israel-news/1.743169.

263 **Sirija je oborila:** Misi Rajan, „U.S. Drone Believed Shot down in Syria Ventured into New Area, Official Says", *Washington Post*, 19. mart 2015, https://www.washingtonpost.com/world/national-security/us-drone-believed-shot-down-in-syria-ventured-into-new-area-official-says/2015/03/19/891a3d08-ce5d-11e4-a2a-7-9517a3a70506_story.html.

263 **Turska je oborila:** „Turkey Shoots down Drone near Syria, U.S. Suspects Russian Origin", *Reuters*, 16. oktobar 2015, http://www.reuters.com/article/us-mideast-crisis-turkey-warplane-idUSKCN-0SA15K20151016.

263 **Kina je zarobila mali podvodni robotski dron:** „China to Return Seized U.S. Drone, Says Washington 'Hyping Up' Incident", *Reuters*, 18. decembar 2016, http://www.reuters.com/article/us-usa-china--drone-idUSKBN14526J.

263 **dron Ratne mornarice Vatreni izvidnik:** Elizabet Bumiler, „Navy Drone Wanders Into Restricted Airspace Around Washington", *New York Times*, 25. avgust 2010, https://www.nytimes.com/2010/08/26/us/26drone.html.

264 **dron Kopnene vojske tipa Senka:** Aleks Horton, „Questions Hover over Army Drone's 630-Mile Odyssey across Western US", *Stars and Stripes*, 1. mart 2017, https://www.stripes.com/news/questions-hover-over-army-drone-s-630-mile-odyssey-across-western--us-1.456505#.WLby0hLyv5Z.

264 **RQ-170:** Greg Džafe i Tomas Erdbrink, „Iran Says It Downed U.S. Stealth Drone; Pentagon Acknowledges Aircraft Downing", *Washington Post*, 4. decembar 2011, https://www.washingtonpost.com/world/national-security/iran-says-it-downed-us-stealth-drone-pentagon-acknowledges-aircraft-downing/2011/12/04/gIQAyxa8TO_story.html.

264 **Na internetu se pojavilo mnoštvo izveštaja:** Skot Piterson i Pajam Faramarzi, „Exclusive: Iran Hijacked US Drone, Says Iranian

Engineer", *Christian Science Monitor*, 15. decembar 2011, http://www.csmonitor.com/World/Middle-East/2011/1215/Exclusive--Iran-hijacked-US-drone-says-Iranian-engineer.

264 **„čistim lupetanjem":** Dejvid Eks, „Did Iran Hack a Captured U.S. Stealth Drone?" *WIRED*, 24. April 2012, https://www.wired.com/2012/04/iran-drone-hack/.

264 **nespretno priznale da je dron njihov:** Bob Or, „U.S. Official: Iran Does Have Our Drone", *CBS News*, 8. decembar 2011, http://www.cbsnews.com/news/us-official-iran-does-have-our-drone/.

264 **„mreže sistema":** Heder Rof, intervju, 26. oktobar 2016.

265 **„Ako moj autonomni agent":** Ibid.

265 **„Šta su neočekivani nusefekti":** Bredford Tusli, intervju, 27. april 2016.

265 **„Ne znam da li do vojnih posledica velikih razmera":** Ibid.

265 **„mašinskom brzinom… milisekundama":** Ibid.

14 Nevidljivi rat: Autonomija u sajber-prostoru

267 **Internet crv iz 1988:** Ted Ajzenberg i dr., „The Cornell Commission: On Morris and the Worm", *Communications of the ACM* 32, 6 (jun 1989), 706–709, http://www.cs.cornell.edu/courses/cs1110/2009sp/assignments/a1/p706-eisenberg.pdf;

267 **više od 70.000 prijavljenih incidenata sa sajber sigurnošću:** Government Accountability Office, „Information Security: Agencies Need to Improve Controls over Selected High-Impact Sistems", GAO-16-501, Washington, DC, maj 2016, http://www.gao.gov/assets/680/677293.pdf.

267 **Najčešći i najozbiljniji napadi:** Ibid, 11.

267 **otkriveni podaci o istragama radi sigurnosnog pristupa:** Džejms Eng, „OPM Hack: Government Finally Starts Notifying 21.5 Million Victims", *NBC News*, 1. oktobar 2015, http://www.nbcnews.com/tech/security/opm-hack-government-finally-starts-notifying--21-5-million-victims-n437126. „Why the OPM Hack Is Far Worse Than You Imagine", *Lawfare*, 11. mart 2016, https://www.lawfareblog.com/why-opm-hack-far-worse-you-imagine.

267 **kineska vlada tvrdila:** Dejvid E. Sanger, „U.S. Decides to Retaliate Against China's Hacking", *New York Times*, 31. jul 2015, https://

www.nytimes.com/2015/08/01/world/asia/us-decides-to-retaliate--against-chinas-hacking.html. Šon Galager, „At First Sajber Meeting, China Claims OPM Hack Is 'criminal case' [Updated]", *Ars Technica*, 3. Decembar 2015, https://arstechnica.com/tech-policy/2015/12/at-first-sajber-meeting-china-claims-opm-hack-is-criminal-case/. Dejvid E. Sanger i Džuli Hiršfeld Dejvis, „Hacking Linked to China Exposes Millions of U.S. Workers", *New York Times*, 4. jun 2015, https://www.nytimes.com/2015/06/05/us/breach-in-a-federal-computer-sistem-exposes-personnel-data.html.

268 **uticali na čitavu elektronsku infrastrukturu Estonije:** Den Holden, „Estonia, Six Years Later", Arbor Networks, 16. maj 2013, https://www.arbornetworks.com/blog/asert/estonia-six-years-later/.

268 **više od milion računara zaraženih bot mrežom:** „Hackers Take Down the Most Wired Country in Europe", *WIRED*, pristup 14. juna 2017, https://www.wired.com/2007/08/ff-estonia/. „Denial-of-Service: The Estonian Cyberwar and Its Implications for U.S. National Security", *International Affairs Review*, pristup 14. juna 2017, http://www.iar-gwu.org/node/65.

268 **„katastrofalnim" posledicama ako Estonija ukloni spomenik:** „Hackers Take Down the Most Wired Country in Europe".

268 **zvaničnik iz ruske Dume potvrdio:** „Russia Confirms Involvement with Estonia DDoS Attacks", *SC Media US*, 12. mart 2009, https://www.scmagazine.com/news/Rusija-confirms-involvement-with--estonia-ddos-attacks/article/555577/.

268 **mnogo navodnih ili potvrđenih sajber napada:** „Estonia, Six Years Later."

268 **niz sajber napada protiv Saudijske Arabije i Sjedinjenih Država:** Kit B. Aleksander, „Prepared Statement of GEN (Ret) Keith B. Alexander* on the Future of Warfare before the Senate Armed Services Committee",3. novembar 2015, http://www.armed-services.senate.gov/imo/media/doc/Alexander_11-03-15.pdf.

269 **više meseci ili godina timu profesionalnih hakera:** Dejvid Kušner, „The Real Story of Stuxnet", *IEEE Spectrum: Tehnology, Engineering and Science News*, 26. februar 2013, http://spectrum.ieee.org/telecom/security/the-real-story-of-stuxnet.

269 **„nula dana":** Kim Zeter, „Hacker Lexicon: What Is a Zero Day?",*WIRED*, 11. novembar 2014, https://www.wired.com/2014/11/what-is-a-zero-day/.

269 **Staksnet ih je imao četiri:** Majkl Džozeph Gros, „A Declaration of Cyber War. *Vanity Fair,* mart 2011, https://www.vanityfair.com/news/2011/03/stuxnet-201104.

269 **programabilnim logički kontroleri:** Gros, „A Declaration of Sajber War.“ Nicolas Falliere, Liam O Murchu, and Eric Chien, „W32.Stuxnet Dossier“, Symantec Security Response, februar 2011, https://www.symantec.com/content/en/us/enterprise/media/security_response/whitepapers/w32_stuxnet_dossier.pdf.

270 **dve enkriptovane „bojeve glave“:** Gross, „A Declaration of Cyber War“.

270 **Specijalisti za kompjutersku sigurnost uglavnom su saglasni:** Falliere et al., „W32.Stuxnet Dossier“, 2, 7.

270 **za obogaćivanje nuklearnog materijala u Natanzu:** Gros, „A Declaration of Cyber War“. Ralph Langner, „Stuxnet Deep Dive“, S4x12, https://vimeopro.com/s42012/s4-2012/video/35806770. Kushner, imeopro.com/s42012/Stuxnet.t

270 **Bezmalo 60 procenata zaraze Staksnetom:** Falijere i dr., „W32. Stuxnet Dossier“, 5–7. Kim Zeter, „An Unprecedented Look at Stuxnet, the World's First Digital Weapon“, *WIRED*, 3. novembar 2014, https://www.wired.com/2014/11/countdown-to-zero-day-stuxnet/.

270 **s naglim padom broja funkcionalnih centrifuga:** Džon Markof i Dejvid E. Sanger, „In a Computer Worm, a Possible Biblical Clue“, *New York Times*, 24. septembar 2010, http://www.nytimes.com/2010/09/30/world/middleeast/30worm.html.

270 **Specijalisti za sigurnost dalje su spekulisali:** Ibid. Gros, „A Declaration of Cyber War.“

270 „**Dok su napadači mogli da kontrolišu Staksnet“:** Falijere i dr., „W32.Stuxnet Dossier“, 3.

271 **„kolateralnu štetu“:** Ibid, 7.

271 **preko USB-a da se raširi na samo tri druge mašine:** Ibid, 10.

271 **datum samouništenja:** Ibid, 18.

271 **Neki stručnjaci su u tim bezbednosnim svojstvima videli:** Gros, „A Declaration of Cyber War“.

271 **„oružje otvorenog izvora“:** Patrik Kler, „Stuxnet: Anatomy of a Computer Virus“, video, 2011, https://vimeo.com/25118844.

271 **polazna osnova za buduće sajber oružje:** Džoš Homan, Šon Makbrajd i Rob Kaldvel, „IRONGATE ICS Malware: Nothing to See

Here … Masking Malicious Activity on SCADA Sistems", FireEye, 2. jun 2016, https://www.fireeye.com/blog/threat-research/2016/06/irongate_ics_malware.html.

272 **„To bi trebalo automatizovati":** Kit B. Aleksander, Testimony on the Future of Warfare, Senate Armed Services Committee, 3. novembar 2015, http://www.armed-services.senate.gov/hearings/15-11-03-future-of-warfare. Alexander's comments on automatizacija come up in the question-and-answer period, starting at 1:14:00.

273 **DARPA je održavala Robotički izazov:** DARPA, „DARPA Robotics Challenge (DRC)", pristup 14. juna 2017, http://www.darpa.mil/program/darpa-robotics-challenge. DARPA, „Home | DRC Finals", pristup 14. juna 2017, http://archive.darpa.mil/roboticschallenge/.

274 **„automatski proveravaju svetski softver":** Dejvid Bramli, „Why CGC Matters to Me", ForAllSecure, 26. jul 2016, https://forallsecure.com/blog/2016/07/26/why-cgc-matters-to-me/.

274 **„potpuno autonomni sistem za pronalaženje i sređivanje":** Dejvid Bramli, „Mayhem Wins DARPA CGC", ForAllSecure, 6. avgust 2016, https://forallsecure.com/blog/2016/08/06/mayhem-wins-darpa-cgc/.

274 **Ako je ranjivost analogna slaboj bravi:** Dejvid Bramli, intervju, 24. novembar 2016.

274 **„Postoje stepeni sigurnosti:** Ibid.

275 **„autonomni sistem koji uzima sve one stvari":** Ibid.

275 **„Naš cilj je bio da dođemo do univerzalnog ključa":** Ibid.

276 **„Stvarne autonomije u sajber domenu":** Majkl Voker, intervju, 5. decembar 2016.

276 **uporediti s „kompetentnim" profesionalcem za kompjutersku sigurnost:** Dejvid Bramli, intervju, 24. novembar 2016.

276 **na hakerskoj DEF CON konferenciji:** Danijel Tkačik, „CMU Team Wins Fourth 'World Series of Hacking' Competition", CMU.edu, 31. jul 2017.

276 **Bramlijev tim sa Karnegi Melona:** Ibid.

276 **Miraj:** Brajan Krebs, „Who Makes the IoT Things Under Attack?" Krebs on Security, 3. oktobar 2016, https://krebsonsecurity.com/2016/10/who-makes-the-iot-things-under-attack/.

276 **ogroman DUU napad:** Brajan Krebs, „KrebsOnSecurity Hit With Record DDoS", Krebs on Security, 21. septembar 2016, https://

krebsonsecurity.com/2016/09/krebsonsecurity-hit-with-record--ddos/.

276 **većina IS uređaja „smešno ranjiva“:** Dejvid Bramli, intervju, 24. novembar 2016.

276 **6,4 milijarde:** „Gartner Says 6.4 Billion Connected“, Gartner, 10. novembar 2015, http://www.gartner.com/newsroom/id/3165317.

277 **„proveru svih tih brava“:** Dejvid Bramli, intervju, 24. novembar 2016.

277 **„Nema razlike između tehnologije“:** Ibid.

277 **„Sve tehnologije kompjuterske bezbednosti“:** Majkl Voker, intervju, 5. decembar 2016.

277 **„morate verovati istraživačima“:** Dejvid Bramli, intervju, 24. novembar 2016.

278 **„Biće potrebna ista vrsta“:** Majkl Voker, intervju, 5. decembar 2016.

278 **„Ne tvrdim da možemo da dođemo do toga“:** Ibid.

279 **„Strašna je pomisao na to da ga imaju Rusija i SAD“:** Dejvid Bramli, intervju, 24. novembar 2016.

279 **„kontraautonomija“:** Dejvid Bramli, „Winning Cyber Battles: The Next 20 Years“,neobjavljeni rad, novembar 2016.

279 **„pokušava da pronađe ranjivosti“:** Dejvid Bramli, intervju, 24. novembar, 2016.

279 **„igrate protiv protivnika“: Ibid.**

279 **„To je pomalo kao Trojanski konj“:** Ibid.

279 **„kompjuterskim ekvivalentom ’dugoročne prevare’“:** Bramli, „Winning Cyber Battles: The Next 20 Years.“

280 **„Ne zavaravajte se, sajber rat je rat“:** Ibid.

280 **F-35… desetine miliona linija koda:** Žaklin Šnajder, „Digitally--Enabled Warfare: The Capability-Vulnerability Paradox“, Center for a New American Security, Washington DC, 29. avgust 2016, https://www.cnas.org/publications/reports/digitally-enabled-warfare-the-capability-vulnerability-paradox.

281 **Uzvratno hakovanje imamo kada:** Doroti E. Dening, „Framework and Principles for Active Cyber Defense“, decembar 2013, 3.

281 **uzvratno hakovanje nužno može da uvuče i treća lica:** Den Gudin, „Millions of Dynamic DNS Users Suffer after Microsoft Seizes No-IP Domains“, *Ars Technica*, 30. jun 2014, https://arstechnica.com/security/2014/06/millions-of-dymanic-dns-users-suffer-after--microsoft-seizes-no-ip-domains/.

281 **Uzvratno hakovanje je kontroverzno:** Hana Kučler, „Cyber Insecurity: HackingBack“, *Financial Times,* 27. jul 2015, https://www.ft.com/content/c75a0196-2ed6-11e5-8873-775ba7c2ea3d.

281 **„Svaki postupak ubrzava.“:** Stiv Rozenbuš, „Cyber Experts Draw Line Between Active Defense, Illegal Hacking Back“, *Wall Street Journal*, 28. jul 2016, https://blogs.wsj.com/cio/2016/07/28/sajber-experts-draw-line-between-active-defense-illegal-hacking-back/.

281 **bot mrežu Korflad:** Dening, 6.

282 **Automatizovano uzvratno hakovanje delegiralo bi:** „Hacking Back: Exploring a New Option of Cyber Defense“, *InfoSec Resources*, 8. novembar 2016, http://resources.infosecinstitute.com/hacking-back-exploring-a-new-option-of-sajber-defense/.

282 **„Autonomno sajber oružje moglo bi automatski da“:** Patrik Lin, napomene na konferenciji „CyberWeapons and AutonomousWeapons: Potential Overlap, Interaction and Vulnerabilities“, Institut UN za istraživanje razoružanja, New York, 9. oktobar 2015, http://www.unidir.org/programmes/emerging-security-threats/the-weaponization-of-increasingly-autonomno-technologies-addressing-competing-narratives-phase-ii/cyber-weapons-and-autonomous-weapons-potential-overlap-interaction-and-vulnerabilities. Comment at 5:10.

282 **Automatizovano uzvratno hakovanje je teorijski koncept:** Aleksander Velez-Grin, „When 'Killer Robots' Declare War“, *Defense One*, April 12, 2015, http://www.defenseone.com/ideas/2015/04/when-killer-robots-declare-war/109882/.

282 **automatizacije napada „usmerenim pecanjem“:** Karen Eper Hofman, „Machine Learning Can Be Used Offensively to Automate Spear Phishing“, *Infosecurity Magazine*, 5. avgust 2016, https://www.infosecurity-magazine.com/news/bhusa-researchers-present-phishing/.

282 **automatski razvija „ljudske“ tvitove:** John Seymour and Philip Tully, „Weaponizing data science for social engineering: Automatized E2E spear phishing on Twitter“, https://www.blackhat.com/docs/us-16/materials/us-16-Seymour-Tully-Weaponizing-Data-Science-For-Social-Engineering-Automatized-E2E-Spear-Phishing-On-Twitter-wp.pdf.

283 **„u ofanzivnom sajber ratovanju“:** Erik Mesindžer, „Is It Possible to Ban AutonomousWeapons in Cyberwar?“, *Just Security*, 15. januar 2015, https://www.justsecurity.org/19119/ban-autonomous-weapons-sajberwar/.

284 **između 8 i 15 miliona kompjutera širom sveta:** „Virus Strikes 15 Million PCs“, *UPI*, 26. januar 2009, http://www.upi.com/Top_News/2009/01/26/Virus-strikes-15-million-PCs/19421232924206/.

284 **metod da se suprotstave Konfikeru:** „Clock ticking on worm attack code“, *BBC News*, 20. januar 2009, http://news.bbc.co.uk/2/hi/tehnologija/7832652.stm.

284 **uspeo je s teškom mukom da obuzda Konfikera:** *Microsoft Security Intelligence Report: Volume 11* (11), Microsoft, 2011.

285 **„sprečava i reaguje na protivmere“:** Alesandro Gvarino, „Autonomous Intelligent Agents in Cyber Offence“, u K. Podins, Dž. Stinisen, M. Mejbaum, ur., *2013 5th International Conference on Cyer Conflict* (Tallinn, Estonia: NATO CCD COE Publications, 2013), https://ccdcoe.org/cycon/2013/proceedings/d1r1s9_guarino.pdf.

285 **„sintezi nove logike“:** Majkl Voker, intervju, 5. decembar 2016.

285 **„postoji takva mogućnost i ona je zabrinjavajuća“:** Dejvid Bramli, intervju, 24. novembar 2016.

286 **„Odbranu pokreće otvorenost“:** Majkl Voker, intervju, 5. decembar 2016.

286 **„Sklon sam da u svemu vidim“:** Dejvid Bramli, intervju, 24. novembar 2016.

287 **šta čini „sajber oružje“:** Tomas Rid i Piter Makburni, „Cyber-Weapons“,*The RUSI Journal*, 157 (2012):1, 6–13.

287 **konkretno izuzima sajber oružje:** Ministarstvo odbrane, „Department of Defense Directive Number 3000.09, 2.

287 **„Cilj nije napad“:** Bredford Tusli, intervju, 27. april, 2016.

287 **„Manji broj slučajeva gde dopuštamo“:** Bob Vork, intervju, 22. jun 2016.

288 **„Razradićemo mi to“:** Ibid.

289 **„oni će ga prosto isključiti“:** Ibid.

15 „Prizivanje demona“: Uspon inteligentnih mašina

291 **ne mogu te predmete da povežu:** Mašine su bile u stanju da označe slike relativno tačno, opisujući u opštem smislu ono što se nalazi na njima. Za pregled trenutnih sposobnosti i ograničenja u tumačenju scene, videti JASON, „Perspectives on Research in Artificial Intelligence and Artificial General Intelligence Relevant to DoD“, 10.

292 **Izrada moždane slike:** „Čovek Connectome Project | Mapping the Čovek Brain Connectivity“, accessed June 15, 2017, http://www.

čovekconnectomeproject.org/. „Meet the World's Most Advanced Brain Scanner", *Discover Magazine*, accessed June 15, 2017, http://discovermagazine.com/2013/june/08-meet-the-worlds-most-advanced-brain-scanner.

292 **emulacije celog mozga:** Anders Sandburg i Nik Bostrom, „Whole Brain Emulation: A Roadmap", Technical Report #2008-3, Oxford, UK, 2008, http://www.fhi.ox.ac.uk/Reports/2008-3.pdf

292 **„Kad ljudi kažu da nam do neke tehnologije":** Endru Her, imejl autoru, 22. oktobar 2016.

292 „**poslednji izum":** Irving Dž. Gud, „Speculations Concerning the First Ultraintelligent Machine", maj 1964, https://web.archive.org/web/20010527181244/http://www.aeiveos.com/~bradbury/Authors/Computing/Good-IJ/SCtFUM.html. See also James Barrat, *Our Final Invention* (New York: Thomas Dunne Books, 2013).

292 **„razvoj pune veštačke inteligencije":** Rori Selan-Džons, „Stephen Hawking Warns Artificial Intelligence Could End Mankind", *BBC News*, 2. decembar 2014, http://www.bbc.com/news/tehnologija-30290540.

293 **„Najpre će mašine":** Piter Holi, „Bill Gates on Dangers of Artificial Intelligence: 'I Don't Understand Why Some People Are Not Concerned,'" *Washington Post*, 29. januar 2015, https://www.washingtonpost.com/news/the-switch/wp/2015/01/28/bill-gates-on-dangers-of-artificial-intelligence-dont-understand-why-some-people-are-not-concerned/.

293 **„prizivanje demona":** Mat Makfarland, „Elon Musk: 'With Artificial Intelligence We Are Summoning the Demon,'" *Washington Post*, 24. oktobar 2014, https://www.washingtonpost.com/news/innovations/wp/2014/10/24/elon-musk-with-artificial-intelligence-we-are-summoning-the-demon/.

293 **„Ja pripadam taboru koji je zabrinut":** Holi, „Bill Gates on Dangers of Artificial Intelligence: 'I Don't Understand Why Some People Are Not Concerned.' „

293 **Opišimo ultrainteligentnu mašinu":** Gud, „Speculations Concerning the First Ultraintelligent Machine."

294 **sebe sama uzdići:** „Intelligence Explosion FAQ", *Machine Intelligence Research Institute*, pristup15. juna 2017, https://intelligence.org/ie-faq/.

294 **„VI BUM":** Robin Henson i Elizer Judkovsky, „The Hanson-Yudkowsky AI Foom Debate", http://intelligence.org/files/AIFoomDebate.pdf.

294 **Scenario „mekog uzleta“:** Miler, Vinsent C. i Bostrom, Nik, 'Future progress in artificial intelligence: A Survey of Expert Opinion, in Vincent C. Müller (ed.), *Fundamental Issues of Artificial Intelligence* (Berlin: Springer Synthese Library, 2016), http://www.nickbostrom.com/papers/survey.pdf.

295 **„prostorije za seciranje i klanice“:** Meri Šeli, *Frankenstein; Or, The Modern Prometheus* (London: Lackington, Hughes, Harding, Mavor & Jones, 1818), 43.

295 **Priče o Golemu:** Executive Committee of the Editorial Board., Ludwig Blau, Joseph Jacobs, Judah David Eisenstein, „Golem“, JewishEncylclopedia.com, http://www.jewishencyclopedia.com/articles/6777-golem#1137.

296 **„snom o VI“:** Majkah Klark, intervju, 4. maj 2016.

296 **„gradnju l judima nalik osoba“:** Ibid.

297 **„Zašto bismo očekivali da inteligencija zasnovana na silicijumu“:** Ibid.

297 **Turingov test:** *Loebner Prize* svake godine sprovodi Turingov test. I mada još nijedan računar nije prošao test zavaravši sve sudije, neki programi su u prošlosti uspeli da zavaraju makar jednog sudiju. Trejsi Stedter, „Chat-Bot Fools Judges Into Thinking It's Human“, *Seeker*, 9. jun 2014, https://www.seeker.com/chat-bot-fools-judges-into-thinking-its-human-1768649439.html. Every year the Loebner Prize awards a prize to the „most human“ AI. You can chat with the 2016 winner, „Rose“, here: http://ec2-54-215-197-164.us-west-1.compute.amazonaws.com/speech.php.

297 **Virtuelna VI sekretarica po imenu „Ejmi“:** „Amy the Virtual Assistant Is So Human-Like, People Keep Asking It Out on Dates“, pristup 15. juna 2017, https://mic.com/articles/139512/xai-amy-virtual-assistant-is-so-human-like-people-keep-asking-it-out-on-dates.

297 **„Kad bismo pretpostavili da sutra na zemlju sleti inteligentno tuđinsko živo biće“:** Majkah Klark, intervju, 4. maj 2016.

299 **„bilo koji nivo inteligencije mogao da se u principu“:** Nik Bostrom, „The Superintelligent Will: Motivation and Instrumental Rationality in Advanced Artificial Agents“, http://www.nickbostrom.com/superintelligentwill.pdf.

299 „**VI vas ne mrzi“:** Elizer S. Judkovsky, „Artificial Intelligence as a Positive and Negative Factor in Global Risk“, http://www.yudkowsky.net/singularity/ai-risk.

300 **„Napravite robota koji igra šah“:** Stiven M. Omohundro, „The Basic AI Drives“, https://selfawaresistems.files.wordpress.com/2008/01/ai_drives_final.pdf.

300 **„Bez posebnih predostrožnosti“:** Ibid.

300 **u sanduke obložene olovom povezane s heroinskom infuzijom:** Patrik Soer, „Threat from Artificial Intelligence Not Just Hollywood Fantasy“, 27. jun 2015, http://www.telegraph.co.uk/news/science/science-news/11703662/Threat-from-Artificial-Intelligence-not-just-Hollywood-fantasy.html.

301 **„njen konačni cilj jeste da nas usreći“:** Nik Bostrom, *Superintelligence: Paths, Dangers, Strategies* (Oxford: Oxford University Press, 2014), Chapter 8.

301 **„sistem koji optimalizuje funkciju“:** Stjuart Rasel, „Of Myths and Moonshine“, *Edge,* 14. novembar 2014, https://www.edge.org/conversation/the-myth-of-ai#26015.

301 **„perverzne konkretne primene“:** Bostrom, *Superintelligence,* Chapter 8.

301 **naučila kako da pauzira tetris:** Tom Marfi VII, „The First Level of Super Mario Bros. is Easy with Lexicographic Orderings and Time Travel… after that it gets a little tricky“, https://www.cs.cmu.edu/~tom7/mario/mario.pdf. IstaVI je takođe otkrila i iskoristila nekoliko bagova, kao što je onaj u igri *Super Mario Brothers*koji joj je omogućio da gazi gumbe odozdo.

301 **EURISKO:** Daglas B. Lenat, „EURISKO: A Program That Learns New Heuristics and Domain Concepts“, *Artificial Intelligence* 21 (1983), http://www.cs.northwestern.edu/~mek802/papers/not-mine/Lenat_EURISKO.pdf, 90.

302 **„izbegavanje da se mašini postavi bilo kakva konkretna svrha“:** Dilan Hadfild-Menel, Anka Dragan, Piter Abel, Stjuart Rasel, „Cooperative Inverse Reinforcement Learning“, 30th Conference on Neural Information Processing Sistems (NIPS 2016), Barcelona, Spain, 12. novembar 2016, https://arxiv.org/pdf/1606.03137.pdf.

302 **tako da ih ljudski programeri mogu korigovati:** Nejt Soareš i dr., „Corrigibility“, in AAAI Workshops: Workshops at the Twenty-Ninth AAAI Conference on Artificial Intelligence, Austin, TX, 25-26. januar 2015, https://intelligence.org/files/Corrigibility.pdf.

302 **ravnodušne prema tome hoće li biti isključene ili ne:** Lorent Orsoi Stjuart Armstrong, „Safely Interruptible Agents“, https://intelligence.org/files/Interruptibility.pdf.

302 **projektovanja VI tako da bude alat:** Holden Karnovski, „Thoughts on the Singularity Institute", 11. maj 2012, http://lesswrong.com/lw/cbs/thoughts_on_the_singularity_institute_si/.

303 **„one možda ne bi mogle da rade":** Stjuart Armstrong, intervju, 18. novembar 2016.

303 **VI alati bi mogli i dalje da se otrgnu kontroli:** Bostrom, *Superintelligence*, 184–193.

303 **„Takođe moramo da razmotrimo… da li su VI alati":** Stuart Armstrong, interview, November 18, 2016.

303 **„Samo tvrdnjom: 'trebalo bi samo da gradimo…'":** Ibid.

303 **njega rizik od VI „ne zabrinjava":** Šeron Godan, „Ballmer Says Machine Learning Will Be the next Era of Computer Science", *Computerworld*, 13. novembar 2014, http://www.computerworld.com/article/2847453/ballmer-says-machine-learning-will-be-the-next-era-of-computer-science.html.

303 **„Neće doći do eksplozije inteligencije":** Džef Hokins, „The Terminator Is Not Coming. The Future Will Thank Us", *Recode*, 2. mart 2015, https://www.recode.net/2015/3/2/11559576/the-terminator-is-not-coming-the-future-will-thank-us.

303 **Mark Zakerberg:** Alana Petrof, „Elon Musk Says Mark Zuckerberg's Understanding of AI Is 'Limited,'" CNN.com, July 25, 2017.

304 **nije „zabrinut zbog samosvesti":** Dejvid Bramli, intervju, 24. novembar 2016.

304 **„potpuno kontradiktoran":** Stuart Armstrong, interview, November 18, 2016.

305 **poker je postao poslednja igra koja je pala:** Olivija Solon, „Oh the Humanity! Poker Computer Trounces Humans in Big Step for AI", *The Guardian*, 30. januar 2017, sec. Technology, https://www.theguardian.com/tehnologija/2017/jan/30/libratus-poker-artificial-intelligence-professional-čovek-players-competition.

305 **igra s „nesavršenim informacijama":** Vil Najt, „Why Poker Is a Big Deal for Artificial Intelligence", *MIT Tehnology Review*, 23. januar 2017, https://www.tehnologijareview.com/s/603385/why-poker-is-a-big-deal-for-artificial-intelligence/.

305 **vrhunski svetski igrači pokera vešto su porazili:** Kameron Tang, „Humans Out-Play an AI at Texas Hold 'Em – For Now",*WIRED*, 21. maj 2015, https://www.wired.com/2015/05/čoveks-play-ai-texas-hold-em-now/.

305 **nadograđena VI je „zgromila“:** Kejd Mec, „A Mystery AI Just Crushed the Best Human Players at Poker“, *WIRED*, 31. januar 2017, https://www.wired.com/2017/01/mystery-ai-just-crushed-best-čovek-players-poker/.

305 **„čim nešto funkcioniše“:** Majkah Klark, intervju, 4. maj 2016.

305 **„čim jedan kompjuter bude u stanju to da radi“:** Stjuart Armstrong, intervju, 18. novembar 2016. Ovo su takođe kazali i autori studije VI sa Stenforda: Piter Ston, Rodni Bruks, Erik Brajnjolfson, Rajan Kalo, Oren Ecioni, Greg Hager, Džulija Hiršberg, Šivaram Kalijanakrišnan, Ece Kamar, Sarit Kraus, Kevin Lejton-Braun, Dejvid Parks, Vilijam Pres, Anali Saksenijan, Džuli Šah, Milind Tambe i Astro Teler. „Artificial Intelligence and Life in 2030.“ One Hundred Year Study on Artificial Intelligence: Izveštaj, 2015–2016 Study Panel, Stanford University, Stanford, CA, septembar 2016, 13. http://ai100.stanford.edu/2016-report.

306 **„odgovorno korišćenje“:** AAAI.org, http://www.aaai.org/home.html.

306 **„diskusija o superinteligenciji većinom“:** Tom Ditrih, intervju, 27. april 2016.

306 **„protivno našem sadašnjem razumevanju“:** Tomas G. Ditrih i Erik Dž. Horvic, „Viewpoint Rise of Concerns about AI: Reflections and Directions“, *Communications of the ACM* 58, no. 10 (oktobar 2015): 38–40, http://web.engr.oregonstate.edu/~tgd/publications/dietterich-horvitz-rise-of-concerns-about-ai-reflections-and-directions-CACM_Oct_2015-VP.pdf.

306 **„Sve veće sposobnosti VI“:** Tom Ditrih, intervju, 27. april 2016.

307 **„robusna pred napadom protivnika“:** Ibid.

307 **„Čovek bi trebalo da preduzima postupke“:** Ibid.

307 **„Čitav cilj u vojnoj doktrini“:** Ibid.

308 **za OVI da je „opasna“:** Bob Vork, intervju, 22. jun 2016.

308 **više vidi kao Ajronmena nego kao Terminatora:** Sidni Dž. Fridburg Ml., „Iron Man, Not Terminator: The Pentagon's Sci-Fi Inspirations“, *Breaking Defense*, 3. maj 2016, http://breakingdefense.com/2016/05/iron-man-not-terminator-the-pentagons-sci-fi-inspirations/. Metju Rozenberg i Džon Markof, „The Pentagon's 'Terminator Conundrum': Robots That Could Kill on Their Own“, *New York Times*, 25. oktobar 2016, https://www.nytimes.

com/2016/10/26/us/pentagon-artificial-intelligence-terminator.html.

308 **„nameće obaveze osobama“:** Office of General Counsel, Department of Defense, „Department of Defense Law of War Manual“, jun 2015, https://www.defense.gov/Portals/1/Documents/law_war_manual15.pdf, 330.

308 **„krajnji cilj VI“:** „Krajnji cilj VI (od čijeg smo postizanja veoma daleko) jeste da izgradimo osobu, ili skromnije, životinju.“ Judžin Čarnijak i Dru Makdermot, *Introduction to Artificial Intelligence* (Boston: Addison-Wesley Publishing Company, 1985), 7.

309 **„oni nesumnjivo teže sposobnostima na nivou ljudskih“:** Selmer Bringsjord, intervju, 8. novembar 2016.

309 **„možemo da planiramo koliko god želimo“:** Ibid.

309 **„protivničke VI“ i „VI bezbednost“:** Stjuart Rasel, Danijel Djui i Maks Tegmark, „Research Priorities for Robust and Beneficial Artificial Intelligence“, Association for the Advancement of Artificial Intelligence (zima 2015), http://futureoflife.org/data/documents/research_priorities.pdf.

309 **zlonamerne primene VI:** Jedan od nekoliko članaka koji se bave ovim problemom jeste u: Federiko Pistono i Roman V. Jampolskij, „Unethical Research: How to Create a Malevolent Artificial Intelligence“, septembar 2016, https://arxiv.org/pdf/1605.02817.pdf.

310 **Reakcija Ilona Maska:** Ilon Mask, status na Tviteru, 14. jul 2016, 2:42am, https://twitter.com/elonmusk/status/753525069553381376.

310 **„adaptivnog i nepredvidivog“:** Dejvid Bramli, intervju, 24. novembar 2016.

310 **„faustovskom pogodbom“:** Ričard Dancig, „Surviving on a Diet of Poisoned Fruit: Reducing the National Security Risks of America’s Sajber Dependencies“, Center for a New American Security, Washington, DC, 21. jul 2014, https://www.cnas.org/publications/reports/surviving-on-a-diet-of-poisoned-fruit-reducing-the-national-security-risks-of-americas-sajber-dependencies, 9.

311 **„smeštanja ljudi u petlje odlučivanja“:** Ibid, 21.

311 **„odricanje“:** Ibid, 20.

311 **ekosistem:** Dejvid Bramli, intervju, 24. novembar 2016.

311 **Armstrong je procenio na 80 procenata:** Stjuart Armstrong, intervju, 18. novembar 2016.

16 Roboti na optuženičkoj klupi: Autonomno oružje i ratno pravo

315 **Biblijska knjiga o Deuteronomiji:** Deuteronomy 20:10–19. Manuovi zakoni 7:90–93.

315 ***Princip razlikovanja**: „Član 51: Zaštita civilnog stanovništva" i „Član 52: Opšta zaštita civilnih objekata", Protokol uz Ženevske konvencije od 12. avgusta 1949, i u vezi sa Zaštitom žrtava međunarodnih oružanih sukoba (Protokol I), 8. jun 1977, https://ihl-databases.icrc.org/ihl/webart/470-750065 i https://ihl-databases.icrc.org/ihl/WebART/470-750067.*

315 ***Princip proporcionalnosti**: Član 51(5)(b), Protokol uz Ženevske konvencije od 12.avgusta 1949 (Protokol I); i „Pravilo 14: Proporcionalnost u napadu", Običajno MHP, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_cha_chapter4_rule14.*

315 ***Princip izbegavanja nepotrebnih patnji**: „Praksa u vezi s Pravilom 70. Oružje koje po svojoj prirodi izaziva preterane povrede ili nepotrebne patnje", Običajno MHP, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v2_rul_rule70.*

316 ***Predostrožnosti u napadu:** „Član 57: Predostrožnosti u napadu", Protokol uz Ženevske konvencije od 12. avgusta 1949. (Protokol I), https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/9ac284404d38ed2bc1256311002afd89/50fb5579fb098faac12563cd0051dd7c; „Pravilo 15: Predostrožnosti u napadu", Običajno MHP, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule15.*

316 ***„hors de combat"**: „Član 41: Mere za zaštitu neprijatelja izbačenog iz stroja", Protokol uz Ženevske konvencije od 12. avgusta 1949. (Protokol I), https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/WebART/470-750050?OpenDocument; „Pravilo 41: Napadi protiv osoba izbačenih iz stroja", Običajno MHP, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule47.*

316 ***po svojoj prirodi, nediskriminišuće ili nekontrolisano:** „Član 51: Zaštita civilnog stanovništva", i „Pravilo 71: Oružje koje je po svojoj prirodi nediskriminišuće", Običajno MHP, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule71.*

316 **„smrt mnogo civila":** Stiv Gus, intervju, 26. oktobar 2016.

321 **„ne postoji prihvaćena formula":** Kenet Anderson, Danijel Rajsner i Metju Veksmen, „Adapting the Law of Armed Conflict to Autonomous Weapon Systems", *International Law Studies* 90 (2014):

386–411, https://www.usnwc.edu/getattachment/a2ce46e7-1c-81-4956-a2f3-c8190837afa4/dapting-the-Law-of-Armed-Conflict--to-Autonomno-We.aspx, 403.

323 **Drevni tekstovi na sanskritu:** Dharmaśāstras 1.10.18.8, citirano u A. Volter Dorn, *The Justifications for War and Peace in World Religions Part III: Comparison of Scriptures from Seven World Religions* (Toronto: Defence R&D Canada, mart 2010), 20, http://www.dtic.mil/dtic/tr/fulltext/u2/a535552.pdf. Mahabharata, Knjiga 11, Poglavlje 841, „Pravo, sila i rat", strofa 96.10, iz Džejms L. Ficdžerald, ur., *Mahabharata,* tom 7, Knjiga 11 i Knjiga 12, Prvi deo, 1. izdanje (Chicago: University of Chicago Press, 2003), 411.

323 **„bukte plamenom":** Poglavlje VII: 90, Manuovi zakoni, u prevodu G. Bulera, http://sourcebooks.fordham.edu/halsall/india/manu--full.asp.

323 **„natesterisani" bajoneti:** Međutim, natesterisani bajoneti nisu nezakoniti, pod uslovom da se testera koristi kao alat, a ne za nepotrebno povređivanje neprijatelja. Bil Rouds, *An Introduction to Military Ethics: A Reference Handbook* (Santa Barbara, CA: Praeger, 2009), 13–14.

323 **zbog rana koje ono prouzrokuje:** „Protokol o fragmentima koji se ne mogu primetiti (Protokol I), Konferencija Ujedinjenih nacija o zabranama ili restrikcijama upotrebe određenog konvencionalnog oružja koje se može smatrati izazivačem preteranih povreda ili ima nediskriminišući učinak", Ženeva, 1980, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDocument&documentId=1AF77FFE8082AE07C12563CD0051EDF5; „Pravilo 79: Oružje koje povređuje prvenstveno fragmentima koji se ne mogu primetiti", Običajno MHP, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule79.

323 **oslepljenost laserom zaista gora:** Čarles Dž. Danlap, „Is it Really Bolje to be Dead than Blind?", *Just Security*, 13. januar 2015, https://www.justsecurity.org/19078/dead-blind/.

324 **da se preduzme „izvodljiva" predostrožnost":** Član 57(2)(a)(ii), Protokol uz Ženevske konvencije od 12. avgusta 1949. (Protokol I); i „Pravilo 15: Predostrožnosti u napadu", Običajno MHP.

324 **„izvodljive" predostrožnosti:** Anderson i dr., „Adapting the Law of Armed Conflict to Autonomous Weapon Sistems", 403–405.

325 **Liberovog kodeksa:** „Član 71, Opšta naređenja br. 100: Liberov kodeks“, The Avalon Project, http://avalon.law.yale.edu/19th_century/lieber.asp#art71.

325 **„izgubila svest ili ostala na drugi način onesposobljena“:** „Član 41: Mere zaštite za neprijatelje izbačene iz stroja“, Protokol uz Ženevske konvencijeod 12. avgusta 1949. (Protokol I).

326 „**perfidnost“:** „Praksa u vezi s Pravilom 65: Perfidy“, Običajno MHP, https://ihl-databases.icrc.org/customary-ihl/eng/docs/v2_rul_rule65.

327 **„Upravo ste razoružani.“:** Džon S. Kaning, „’You’ve just been disarmed. Have a nice day!’“*IEEE Tehnology and Society Magazine* (proleće 2009), 12–15.

327 **„ciljanje na luk ili strelu“:** Džon Kaning, intervju, 6. decembar 2016.

327 **ultraprecizno oružje koje bi razoružalo:** Džon S. Kaning, „Weaponized Unmanned Sistems: A Transformational Warfighting Opportunity, Government Roles in Making It Happen“, http://www.sevenhorizons.org/docs/CanningWeaponizedunmannedsistems.pdf

327 **„neka mašine ciljaju na mašine“:** Džon S. Kaning, „A Concept of Operations for Armed Autonomno Sistems“, presentation, http://www.dtic.mil/ndia/2006disruptive_tech/canning.pdf.

328 **„jaz odgovornosti“:** Boni Doerti, „Mind the Gap: The Lack of Accountability for Killer Robots“, Human Rights Watch, 9. april 2015, https://www.hrw.org/report/2015/04/09/mind-gap/lack-accountability-killer-robots.

328 **„fer niti pravno izvodljivo“:** Boni Doerti, intervju, 18. novembar 2016.

328 **„’kažnjavanje’ robota“:** Doerti, „Mind the Gap.“

328 **generalno su zaštićeni od građanske odgovornosti:** Doertijeva napominje: „Imunitet za američku vojsku i njene liferante gotovo je nesavladiva prepreka za građansku odgovornost korisnika ili proizvođača potpuno autonomnog oružja. Vojska je imuna na sudske sporove u vezi sa: (1) određivanjem politike, što bi verovatno obuhvatalo i izbor oružja, (2) ratne borbene aktivnosti vojnih snaga i (3) dela počinjena u stranoj zemlji. Proizvođači koji su vojni liferanti na sličan način su imuni na tužbe kad projektuju oružje u skladu sa specifikacijama vlade i bez namernog dovođenja vojsku u zabludu. Isti ti proizvođači takođe su imuni na građanske tužbe u vezi s delima počinjenim za vreme rata.“ Ibid.

328 **„opasnu kombinaciju“:** Boni Doerti, intervju, 18. novembar 2016.

328 **„pravednu odmazdu“:** Ibid.

329 **u „eliminaciji tog jaza odgovornosti“:** Doerti, „Mind the Gap“.

329 **Obaranje je bilo greška:** Rebeka Krutof, „War Torts: Accountability for Autonomno Weapon“, *University of Pennsylvania Law Review* 164, no. 6 (maj 2016): 1347-1402, http://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=9528&context=penn_law_review.

329 **Američka vlada isplatila je 61,8 miliona dolara:**Krutof, „War Torts.“

329 **„pogađa svakoga“:** Boni Doerti, intervju, 18. novembar 2016.

329 **mora postojati pojedinac koji će se smatrati odgovornim:** Čarls Danlap Ml., „Accountability and Autonomous Weapons: Much Ado About Nothing?“ *Temple International and Comparative Law Journal* 30 (1), proleće 2016, 65–66.

330 **„nemaju problem s autonomnim oružjem“:** Ibid.

330 **„U slučajevima koje ne pokriva važeće pravo“:** Protokol uz Ženevske konvencije od 12. avgusta 1949. i u vezi sa zaštitom žrtava nemeđunarodnih oružanih sukoba (Protokol II), 8. jun 1977, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/7c4d08d9b287a42141256739003e636b/d67c3971bcff1c10c125641e0052b545.

331 **„Ne postoji opšteprihvaćeno tumačenje“:** Rupert Tajsherst, „The Martens Clause and the Laws of Armed Conflict“, *International Review of the Red Cross* 317 (30. april 1997), https://www.icrc.org/eng/resources/documents/article/other/57jnhy.htm.

331 **„pripremom“:** Čengiz Erisen, Milton Lodž i Čarls S. Taber, „Affective Contagion in Effortful Political Thinking“, *Political Psychology* 35, no. 2 (April 2014): 187–206.

332 **Karpenterova je naišla:** Čarli Karpenter, „How Do Americans Feel About Full autonomous Weapon?“ Duck of Minerva, 19. jun 2013, http://duckofminerva.com/2013/06/how-do-americans-feel-about-fully-autonomous-weapons.html.

332 **ubojito oružje zagovornika zabrane:** „Q&A on fully autonomousweapon“, Human Rights Watch, 21. oktobar 2013, https://www.hrw.org/news/2013/10/21/qa-fully-autonomous-weapons.

332 **„Prerano je tvrditi da“:** Majkl C. Horovic, „Public Opinion and the Politics of the Killer Robots Debate“,16. februar 2016, http://rap.sagepub.com/content/3/1/2053168015627183.

333 **„'Savest' ima izričito moralnu infleksiju":** Piter Asaro, „Jus nascendi: Robotic Weapon and the Martens Clause", http://www.peterasaro.org/writing/Asaro%20Jus%20Nascendi%20PROOF.pdf.

333 **„Medveđa usluga je redukovati 'diktate javne savesti'":** Ibid.

333 **„kroz javnu raspravu, kao i akademsko proučavanje":** Ibid.

333 **„Letvica za tvrdnju da govorite u ime čovečanstva":** Horovic, „Public Opinion and the Politics of the Killer Robots Debate."

333 **„Najjasnija manifestacija":** Stiv Gous,imejl autoru, 22. novembar 2016.

334 „**naglasimo *posledice* umesto oružja":** Čarls Dž. Danlap i dr., „Guest Post: To Ban New Weapons or Regulate Their Use?", *Just Security*, 3. april 2015, https://www.justsecurity.org/21766/guest-post-ban--weapons-regulate-use/.

334 **savremeni CS gas:** Ibid.

334 **legalno da ga koriste *protiv civila*:** „Riot Control Agents", Organization for the Prohibition of Chemical Weapons, pristup 16. juna 2017, https://www.opcw.org/about-chemical-weapons/types-of--chemical-agent/riot-kontrola-agents/.

334 **„pametnih mina":**Danlap i dr., „Guest Post."

335 **„paradoksa koji nalaže":** Ibid.

335 **„S obzirom na ubrzani naučni razvoj":** Danlap i dr., „Is It Really Better to Be Dead than Blind?"

335 **„*strogo* poštovanje osnovnih principa":** Danlap i dr., „Guest Post."

336 **„Iako još nema žrtava":** Boni Doerti, intervju, 18. novembar 2016.

336 **„veoma brine":** Stiv Gus, intervju, 26. oktobar 2016.

336 **Protokol II:** Protokol o zabrani ili ograničavanju upotrebe mina, miniranih zamki i drugih uređaja u skladu s izmenom od 3. maja 1996 (Protokol II uz Konvenciju OKO iz 1980, u skladu s izmenama od 3.maja 1996), https://ihl-databases.icrc.org/ihl/INTRO/575.

336 **„Opasnosti daleko prevazilaze":** Stiv Gus, intervju, 26. oktobar 2016.

336 **„Ono na čemu stojiš zavisi od toga gde sediš":** Rufus E. Majls, Ml., „The Origin and Meaning of Miles' Law" *Public Administration Review* 38, no. 5 (septembar/oktobar 1978): 399-403. https://www.jstor.org/stable/975497?seq=1#page_scan_tab_contents.

337 **„Uskraćivanje takvih sposobnosti državama":** Danlap i dr., „Guest Post."

337 **„Ratno pravo propisuje napad“:** Ministarstvo odbrane, „Department of Defense Law of War Manual“, 330.

337 **„nasilne postupke protiv neprijatelja“:** „Član 49: Definicija napada i obim primene“, Protokol uz Ženevske konvencije od 12. avgusta 1949, i u vezi sa zaštitom žrtava međunarodnih oružanih sukoba (Protokol I), 8. jun 1977, https://ihl-databases.icrc.org/ihl/WebART/470-750062?OpenDocument.

338 **„veličina nečega što čini napad“:** Kenet Anderson, intervju, 6. januar 2017.

338 **„tehnički termin koji se odnosi na“:** Međunarodni komitet Crvenog krsta, „Commentary of 1987 Protection of the Civilian Population“, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Comment.xsp?action=openDocument&documentId=2C8494C2FCAF8B27C12563CD0043AA67.

338 **„Zamisao o pokretanju napada“:** Kenet Anderson, intervju, 6. januar 2017.

17 Bezdušne ubice: Moralnost autonomnog oružja

340 **„moralno neprihvatljivo“:** Džodi Vilijams, intervju, 27. oktobar 2016.

340 **borci bi imali etičku odgovornost da ih koriste:** Kenet Anderson i MetjuVeksmen, „Law and Ethics for AutonomousWeapon Systems Why a Ban Won't Work and How the Laws of War Can“, Hoover Institution, http://media.hoover.org/sites/default/files/documents/Anderson-Waxman_LawAndEthics_r2_FINAL.pdf, 21-22.

342 **detaljne političke smernice:** Ministarstvo odbrane, „Department of Defense Directive Number 3000.09“.

342 **„golog vojnika“:** Majkl Volcer, *Just and Unjust Wars: A Moral Argument With Historical Illustrations,* 4th ed. (New York: Basic Books, 1977), 138–142.

342 **„Nije protivno ratnom pravu“:** Ibid, 142.

343 **„Rat je surov“:** „William Tecumseh Sherman“, Biography.com, https://www.biography.com/people/william-tecumseh-sherman-9482051.

344 **narednik je prekorio vojnike:** Volcer, *Just and Unjust Wars,* 141.

344 **„Skinuo ga je, ali“:** Ibid, 140.

344 **Oni su izuzetak:** Treba takođe napomenuti da je ova briga o ulozi samilosti primenjiva na protivpešadijsko autonomno oružje. Svi primeri ovih trenutaka samilost oni su u kojima je na meti samo pojedinac. Do njih izgleda ne dolazi u situacijama kada vojnici ciljaju na objekte, čak ni na one u kojima su ljudi, kao što su brodovi ili tenkovi. Zato oružje za dejstva protiv vozila ili materijala ne bi trebalo da bude opterećeno ovom brigom.

345 ***„Pravili su se"*:** Dejv Grosman, *On Killing: The Psychological Cost of Learning to Kill in War and Society* (Boston: Little, Brown and Company, 1996), 3–4.

345 **dokaze iz raznih ratova:** Ibid, 9–28.

345 **urođeno biološki opiru:** Ibid, 177–178.

345 **najpre jedna životinja preda:** Ibid, 5–6.

346 **Rukovaoci dronova:** Keli Ferklot, „Everyone Names Their Roomba. What Would You Name Yours?", http://jezebel.com/everyone-names-their-roomba-what-would-you-name-yours. Džejs Dao, „Drone Pilots Are Found to Get Stress Disorders Much as Those in Combat Do",*New York Times*, 22. februar 2013, https://www.nytimes.com/2013/02/23/us/drone-pilots-found-to-get-stress-disorders-much-as-those-in-combat-do.html. Rebeka Hoks, „Post-Traumatic Stress Disorder Is Higher in Drone Operators",*The Telegraph*, 30. maj 2015, http://www.telegraph.co.uk/culture/hay-festival/11639746/Post-traumatic-stress-disorder-is-higher-in-drone-operators.html. „Can Drone Pilots Be Diagnosed With Post-Traumatic Stress Disorder?", *NPR*.org, pristup 16. juna 2017, http://www.npr.org/2015/06/06/412525635/can-drone-pilots-be-diagnosed-with-post-traumatic-stress-disorder. Ed Pilkington, „Life as a Drone Operator: 'Ever Step on Ants and Never Give It Another Thought?,' „*The Guardian*, 19. novembar 2015, https://www.theguardian.com/world/2015/nov/18/life-as-a-drone-pilot-creech-air-force-base-nevada.

347 **stopa otvaranja vatre:** Grosman, *On Killing*, 153.

347 **„Ako on može da navede ostale da s njim saučestvuju":** Još jedan psihološki faktor koji doprinosi višim stopama otvaranja vatre među rukovaocima mitraljeza, tvrdi Grosman, bila je uzajamna odgovornost za postupke među članovima tima. Ako neko od njih nije obavljao svoj posao kako treba, ostali su to odmah mogli da vide. Ibid, 149–154.

347 **„Vidimo zaista opasno ponašanje“:** Meri Misi Kamings, intervju, 1. jun 2016.

348 **„Fizičko i emotivno distanciranje“:** M. L. Kamings, „Creating Moral Buffers in Weapon Control Interfejs Design“, *IEEE Tehnologija and Society Magazine* (jesen 2004), 29–30.

348 **„Lakše je ispustiti“:** Ibid, 31.

348 **Ljudi često daju ime svojoj Rumbi:** Selest Biver, „My Roomba's Name Is Roswell“, *Slate*, 23. mart 2014, http://www.slate.com/articles/health_and_science/new_scientist/2014/03/roomba_vacuum_cleaners_have_names_irobot_ceo_on_people_s_ties_to_robots.html.

348 **„Moguće je da bez svesnog“:** Kamings, „Creating Moral Buffers in Weapon Control Interfejs Design“, 31.

349 **„dopustiti ljudima da sebe smatraju“:** Ibid, 32.

349 **„Vesela, gotovo smešna grafika“:** Ibid, 32–33.

349 **Kamingsova je kritikovala odluku Kopnene vojske:** Ona koristi termin „upravljanje po izuzetku“ za režim autonomne kontrole s ljudskim nadzorom i „upravljanje po pristanku“ za poluautonomni režim kontrole. Ibid, 33.

349 **„Osposobljavanje jednog sistema da suštinski otvara vatru svojevoljno“:** Ibid, 33.

349 **da preduzme pozitivni postupak pre nego što oružje otvori vatru:** Ibid, 33.

350 **promenila streljačku obuku:** Grosman, *On Killing*, 35.

350 **američko bombardovanje zapaljivim bombama iz vazduha:** Robert S. Maknamara u *Fog of War: Eleven Lessons From the Life of Robert S. McNamara,* dokumentarac, režija Erol Moris (2003; Sony Pictures Classics).

350 **„ponašali kao ratni zločinci“:** Ibid.

350 **zahvaljujući televizijskim prenosima“:** Koin L. Pauel sa Džozefom E. Persikom, *My American Journey* (New York: Ballantine Books, 2003).

351 **Dehumanizacija koja omogućava ubijanje:** Grosman, *On Killing,* 156–164.

351 **ratni zločini:** Ibid, 210–211.

351 **ispitivanja mentalnog zdravlja raspoređenih američkih vojnika:** Office of the Surgeon, Multi-National Force Iraq and Office of the Surgeon General, United States Army Medical Command, „Mental

Health Advisory Team (MHAT) IV, Operation Iraqi Freedom 05–07, Final Report", 17. novembar 2006, http://armymedicine.mil/Documents/MHAT-IV-Report-17NOV06-Full-Report.pdf, 34–42. Office of the Surgeon, Multi-National Force Iraq and Office of the Surgeon General, United States Army Medical Command, „Mental Health Advisory Team (MHAT) V, Operation Iraqi Freedom 06-08, Final Report",14. februar 2008, http://armymedicine.mil/Documents/Redacted1-MHATV-OIF-4-FEB-2008Report.pdf, 30–32.

352 **„Šta ako [robotika] zaista funkcioniše?":** Ron Arkin, intervju, 8. jun 2016.

352 **„Mene je baš briga za robote":** Ibid.

352 **„Etički regulator":** Ronald C. Arkin, „Governing Lethal Behavior: Embedding Ethics in a Hybrid Deliberative/Reactive Robot Architecture", Technical Report GIT-GVU-07-11, http://www.cc.gatech.edu/ai/robot-lab/online-publications/formalizationv35.pdf.

353 **„moralni imperativ da upotrebimo tu":** Ron Arkin, intervju, 8. jun 2016.

353 **Tipična bomba je imala samo:** „Accuracy and Employment of Air-Dropped Guided Munitions by the United States", Center for a New American Security, https://s3.amazonaws.com/files.cnas.org/images/Accuracy-and-employment-air-dropped-guided-munitions.jpg.

353 **više od 9.000 bombi:** Ričard P. Halion, „Precision Guided Munitions and the New Era of Warfare", APSC Paper Number 53, Air Power Studies Centre, http://fas.org/man/dod-101/sys/smart/docs/paper53.htm.

353 **do udaljenosti od metar i po:** „Accuracy and Employment of Air--Dropped Guided Munitions by the United States."

354 **američki napadi dronovima:** „Drone Wars: The Full Data", *The Bureau of Investigative Journalism*, accessed June 16, 2017, https://www.thebureauinvestigates.com/stories/2017-01-01/drone-wars--the-full-data.

354 **„upotreba neselektivnih raketa":** „Ukraine: Unguided Rockets Killing Civilians", *Human Rights Watch*, 24. jul 24, 2014, https://www.hrw.org/news/2014/07/24/ukraine-unguided-rockets-killing--civilians.

354 **„neko ljudsko ponašanje je sasvim nečasno":** Ron Arkin, intervju 8. jun 2016.

354 **„potpuno i krajnje neprihvatljiv“:** Ronald Arkin, „The Case for Banning Killer Robots: Counterpoint“, pristup 16. juna 2017, https://cacm.acm.org/magazines/2015/12/194632-the-case-for-banning-killer-robots/abstract.

355 **„softversku kočnicu“:** Ron Arkin, intervju, 8. jun 2016.

355 **„tamo negde u kancelariji nekog generala“:** Ibid.

355 **„Ni najmanje ne sumnjam“:** Džodi Vilijams, intervju, 27. oktobar 2016.

356 **„Treba li da stvaramo tigrove u kavezu“:** Ron Arkin, intervju, 8. jun 2016.

356 **„Odakle vreba opasnost?“:** Ibid.

356 **„treba to da istražimo“:** Ibid.

357 **„ne mogu da podržim“:** Ibid.

357 **„utilitarne, konsekvencijalističke“:** Ibid.

357 **„fundamentalno nehumano“:** DžodiVilijams, intervju, 27. oktobar 2016.

358 **„fundamentalno pitanje da li je prikladno“:** Piter Asaro, intervju, 19. decembar 2016.

359 **„Koje odluke nalažu jedinstveni ljudski sud?“:** Kenet Anderson, imejl autoru, 4. januar 2016.

360 **ukoliko je doneta odluka da se oduzme ljudski život:** Dankan Pervs, Rajan Dženkins i Bredli Dž. Stroser, „Autonomous Machines, Moral Judgment, and Acting for the Right Reasons“ *Ethical Theory and Moral Practice* 18, no. 4 (2015): 851–872.

360 **„Najfundamentalnije i najvažnije moralno pitanje“:** Piter Asaro, intervju, 19. decembar 2016.

360 **Hejns je pozvao države da proglase:** Kristof Hejns, „Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions“, United Nations Human Rights Council, 9. april 2013, http://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session23/A-HRC-23-47_en.pdf.

361 **„proizvoljno donositi odluku“:** Kristof Hejns, intervju, 18. maj 2016.

361 **„fundamentalno kršenje“:** Piter Asaro, intervju, 19. decembar 2016.

361 **pravo da umru dostojanstvenom smrću:** Naravno, časna smrt je često bila važna u ratničkoj kulturi, ali to nije isto kao i pružanje neprijatelju prilike da umre dostojanstvenom smrću.

361 **„Rat bez razmišljanja samo je mehanički pokolj“:** Nik Kaming-Brus, „U.N. Expert Calls for Halt on Military Robots“, *New York Times*, 30. maj 2013, sec. Europe, https://www.nytimes.com/2013/05/31/world/europe/united-nations-armed-robots.html.

363 **„Ako eliminišete moralni teret“:** Piter Asaro, intervju, 19. decembar 2016.

363 „**moralnu povredu“:** Dejvid Vud, „Moral Injury“, *The Huffington Post*, pristup 17. juna 2017, http://projects.huffingtonpost.com/projects/moral-injury. Shira Maguen and Brett Litz, „Moral Injury in the Context of War“, PTSD: National Center for PTSD, pristup17. juna 2017, https://www.ptsd.va.gov/professional/co-occurring/moral_injury_at_war.asp. „What Is Moral Injury“, The Moral Injury Project, pristup17. juna 2017, http://moralinjuryproject.syr.edu/about-moral-injury/.

363 **najtraumatičnija stvar koju jedan vojnik može da doživi:** Grosman, *On Killing,* 87–93, 156–158.

368 **„Jedno od pitanja kojima smo posvetili“:** Pol Selva, „Innovation in the Department of Defense with General Paul Selva“, Center for Strategic and International Studies, https://www.csis.org/events/innovation-defense-department-general-paul-selva. Remarks on autonomous Weapon begin around 39:00.

368 **„Pošto krećemo u rat noseći svoje vrednosti“:** Pol Selva, svedočenje pred komisijom Senata za oružane snage, 18. jul 2017, https://www.armed-services.senate.gov/hearings/17-07-18-nomination_--selva. Komentari o autonomnom oružju počinju oko 1:11:10.

369 **„Rat je pokušaj uvećanja“:** Džodi Vilijams, intervju, 27. oktobar 2016.

369 **„prelazi moralni Rubikon“:** Ibid.

369 **„Znate li razliku između dobrog robota i zlog robota?“:** Ibid.

370 **dobri Terminatori:** Ron Arkin, intervju, 8. jun 2016.

370 **na „principu ljudskog dostojanstva mimo MHP“:** Ken Anderson, intervju, 6. januar 2016.

370 **„moramo se onda upitati da li“:** Kristof Hejns, intervju, 18. maj 2016.

371 **„pod uslovom da pritom ne izgubimo dušu“:** Ron Arkin, intervju, 8. jun 2016.

371 **„nije mnogo smetalo ubijanje Japanaca“:** „General Kertis E. LeMej, (1906–1990)“, PBS.org, http://www.pbs.org/wgbh//amex/bomb/peopleevents/pandeAMEX61.html.

371 **„Umoran sam i muka mi je od rata“:** „Vilijam Tekumse Šerman.“

18 Igranje vatrom: Autonomno oružje i stabilnost

374 **samo je dodatno podsticalo Sovjetski Savez:** Majkl S. Gerson, „The Origins of Strategic Stability: The United States and the Threat of Surprise Attack", u Elbridž A. Kolbi i Majkl S. Gerson, ur., *Strategic Stability: Contending Interpretations* (Carlisle, PA: Strategic Studies Institute and U.S. Army War College Press, 2013), 3–35.

374 **„moramo brinuti zbog njegovog napada na nas":** T. C. Šeling, *Surprise Attack and Disarmament* (Santa Monica, CA: RAND, 10. decembar 1958).

374 **„kad niko prvim udarom":** Ibid.

375 **„U stabilnoj situaciji":** Elbridž Kolbi, „Defining Strategic Stability: Reconciling Stability and Deterrence", u Kolbi i Gerson, *Strategic Stability*, 57.

376 „**Okončanje rata":** Tomas C. Šeling, *Arms and Influence* (New Haven and London: Yale University Press, 1966), 203–208. Fred Ajkl, *Every War Must End* (New York: Columbia Classics, 2005).

378 **Sporazum o svemiru:** Sporazum o principima kojih će se države pridržavati u istraživanju i korišćenju svemira, uključujući Mesec i druga nebeska tela, 1967, http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html.

378 **Sporazum o morskom dnu:** Sporazum o zabrani postavljanja nuklearnog oružja i drugog oružja masovnog uništenja na morsko i okeansko dno i u tamošnje donje slojeve zemlje, 1971, https://www.state.gov/t/isn/5187.htm.

378 **Konvencija o modifikaciji životne sredine:** Konvencija o zabrani vojne ili bilo koje druge nepreijateljske primene tehnika za modifikaciju životne sredine, 1977, https://www.state.gov/t/isn/4783.htm.

378 **Sporazum o antibalističkim projektilima (ABM):** Sporazumn između Sjedinjenih Američkih Država i Saveza Sovjetskih Socijalističkih Republika o ograničavanju sistema antibalističkih projektila (ABM sporazum), 1972, https://www.state.gov/t/avc/trty/101888.htm.

378 **Sporazum o nuklearnim snagama srednjeg dometa (INF):** U.S. Department of State, „Treaty Between the United States of American and the Union of Soviet Socialist Republics on the Elimination of their Intermediate-Range and Shorter-Range Missiles", pristup17. jun 2017, https://www.state.gov/www/global/arms/treaties/inf1.html#treaty.

379 **neutronske bombe:** U praksi, međutim, svako podesivo nuklearno oružje varijabilne snage bi moglo da funkcioniše kao neutronska bomba.

379 **napadač mogao da koristi osvojenu teritoriju:** To ne znači da za neutronske bombe, teorijski, nije bilo legitimne primene. Sjedinjene Države su gledale na neutronske bombe kao na vredno oružje zato što su mogle da se upotrebe za pobedu nad sovjetskim oklopnim formacijama na savezničkoj teritoriji bez ostavljanja rezidualne radijacije.

379 **američki planovi raspoređivanja neutronskih bombi u Evropi:** Mark Straus, „Though It Seems Crazy Now, the Neutron Bomb Was Intended to Be Human", *io9*, 19. septembar 2014, http://io9.gizmodo.com/though-it-seems-crazy-now-the-neutron-bomb-was-intende-1636604514.

379 **prednost prvog poteza u pomorskom ratovanju:** Vejn Hjuz, *Fleet Tactics and Coastal Combat,* 2nd ed. (Annapolis, MD: Naval Institute Press, 1999).

379 **„Veštačka inteligencija, rat i krizna stabilnost":** Majkl C. Horovic, „Artificial Intelligence, War, and Crisis Stability", 29. novembar 2016. [neobjavljeni rukopis, iz juna 2017].

380 **robotski rojevi dovesti do:** Žan-Mark Rikli, „Some Considerations of the Impact of LAWS on International Security: Strategic Stability, Non-State Actors and Future Prospects", rad podnet na Sastanku eksperata i smrtonosnim autonomnim sistemima naoružanja, Konvencija Ujedinjenih nacija o određenom konvencionalnom oružju (OKO), 16. april 2015, http://www.unog.ch/80256EDD006B8954/(httpAssets)/B6E6B974512402BEC1257E2E0036AAF1/$file/2015_LAWS_MX_Rickli_Corr.pdf.

380 **snize prag korišćenja sile:** Piter M. Asaro, „How Just Could a Robot War Be?" http://peterasaro.org/writing/Asaro%20Just%20Robot%20War.pdf.

381 **„Kad uopšte treba primeniti te sisteme?":** Majkl Horovic, intervju, 7. decembar 2016.

383 **„Stavljanje naglaska na brzinu":** Šeling, *Arms and Influence,* 227.

383 **„Kad je brzina od kritične":** Ibid, 227.

383 **kontrole nad eskalacijom:** Videti takođe Jirgen Altman i Frenk Sauer, „AutonomousWeaponSystems and Strategic Stability", *Survival* 59:5 (2017), 117–42.

384 **„uređaja koji obuzdavaju oružje":** Ibid, 231.

385 **rat između nuklearnih sila:** Elbridž Kolbi, „America Must Prepare for Limited War", *The National Interest,* 21. oktobar 2015, http://nationalinterest.org/feature/america-must-prepare-limited--war-14104.

385 „**Države [koje primenjuju autonomno oružje]": ** Majkl Karl Has, „Autonomous Weapon Systems: The Military's Smartest Toys?" *The National Interest*, 20. novembar 2014, http://nationalinterest.org/feature/autonomous Weapon-sistems-the-militarys-smartest--toys-11708.

385 **probno lansiranje ICBM-a Atlas:** Sagan, *The Limits of Safety,* 78–80.

386 **U-2 koji je leteo iznad Arktičkog kruga:** Martin Dž. Šervin, „The Cuban Missile Crisis at 50", *Prologue Magazine* 44, no. 2 (Fall 2012), https://www.archives.gov/publications/prologue/2012/fall/cuban--missiles.html.

386 **general Tomas Pauer:** Pauerove motivacije za slanje ove poruke bile su predmet rasprave među istoričarima. Videti Sagan, *The Limits of Safety,* 68–69.

386 „**komandantove namere": ** Headquarters, Department of the Army, Field Manual 100-5 (jun 1993), 6-6.

387 **„Ako… neprijateljski zapovednik": ** Lorens Dž. Šatuk, „Communicating Intent and Imparting Presence", *Military Review* (mart–april 2000), http://www.au.af.mil/au/awc/awcgate/milreview/shattuck.pdf, 66.

387 „**relokaciju važnih sredstava": ** Has, „Autonomous Weapon Systems."

388 „**strateški kaplar": ** Čarls C. Krulak, „"The Strategic Corporal: Leadership in the Three Block War", *Marines Magazine* (januar 1999).

388 **„afirmativnu ljudsku odluku": ** „Nijedna agencija savezne vlade ne sme da planira, finansira ili na drugi način podržava razvoj sistema komande i kontrole za stratešku odbranu u fazi podizanja ili fazi posle podizanja projektila protiv pretnji balističkih projektila koji bi omogućio takvoj strateškoj odbrani da inicira usmeravanje štetne ili smrtonosne vatre izuzev na osnovu afirmativne ljudske odluke na prikladnom nivou odlučivanja." 10 U.S.C. 2431 čl. 224.

389 **„i dalje imate problem da je to": ** Dejvid Denks, intervju, 13. januar 2017.

389 „**Pre nego što smo poslali U-2": ** Robert Maknamara, intervju je sadržao i specijalni prilog o filmu *Doktor Strejndžlav ili: Kako sam*

naučio da prestanem da se brinem i zavoleo bombu (DVD). Columbia Tristar Home Entertainment, (2004) [1964].

389 „**Sad ćemo ih razneti!“:** Vilijam Bur i Tomas S. Blanton, ur., „The Submarines of October“, The National Security Briefing Book, No. 75, 31. oktobar 2002, http://nsarchive.gwu.edu/NSAEBB/NSAEBB75/. „The Cuban Missile Crisis, 1962: Press Release, 11 oktobar 2002, 5:00 PM“, pristup17. juna 2017, http://nsarchive.gwu.edu/nsa/cuba_mis_cri/press3.htm.

391 **igrom kukavice:** Šeling, *Arms and Influence*, 116–125. Herman Kahn, *On Escalation: Metaphors and Scenarios* (New Brunswick and London: Transaction Publishers, 2010), 10–11.

391 **„uzima volan“:** Kan, *On Escalation,* 11.

391 **„kako bi Kenedijeva administracija“:** Horovic, „Artificial Intelligence, War, and Crisis Stability“,novembar.

392 **„Zbog automatizovanog i neopozivog“:** *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb*, režija Stenli Kjubrik (1964).

392 **Mrtva ruka:** Nikolas Tompson, „Inside the Apocalyptic Soviet Doomsday Machine“, *WIRED*, 21. septembar 2009, https://www.wired.com/2009/09/mf-deadhand/. Vitalii Leonidovich Katajev, koga je intervjuisao Elis Mišulović, maj 1993, http://nsarchive.gwu.edu/nukevault/ebb285/vol%20II%20Kataev.PDF. Vartolomej Vladimirovič Korobušin, koga je intervjuisao Džon Dž. Hajns, 10. decembar 1992, http://nsarchive.gwu.edu/nukevault/ebb285/vol%20II%20Korobushin.PDF.

392 **Priče o funkcionalnosti Perimetra se razlikuju:** Neki bivši sovjetski zvaničnici tvrde da je Mrtva ruka istraživana i možda čak i razvijena, ali nikad nije operativno raspoređena. Andrijan A. Danilevič, koga je intervjuisao Džon Dž. Hajns, 5. mart 1990, http://nsarchive.gwu.edu/nukevault/ebb285/vol%20iI%20Danilevich.pdf, 62-63; i Viktor M. Surikov, ikoga je intervjuisao Džon Dž. Hajns, 11. septembar 1993, http://nsarchive.gwu.edu/nukevault/ebb285/vol%20II%20Surikov.PDF, 134-135. Ipak, nije jasno da li se to odnosi na potpuno automatski sistem. Više izvora potvrđuje da je sistem bio aktivan premda je u njihovim tvrdnjama stepen automatizacije dvosmislen: Katajev, 100–101; i Korobushin, 107.

392 **ostane neaktivan u doba mira:** Korobušin, 107; Tompson, „Inside the Apocalyptic Soviet Doomsday Machine.“

392 **mreža svetlosnih, radijacionih, seizmičkih i senzora pritiska:** Ibid.

393 **lideri bi bili izbačeni iz petlje:** Ibid.

393 **raketa koje bi preletele preko sovjetske teritorije:** Katajev. Korobušin.

394 **Perimetar je i dan-danas operativan:** Tompson, „Inside the Apocalyptic Soviet Doomsday Machine".

394 **„paradoks stabilnosti-nestabilnosti":** Majkl Krepon, „The Stability-Instability Paradox, Misperception, and Escalation Control in South Asia", The Stimson Center, 2003, https://www.stimson.org/sites/default/files/file-attachments/stability-instability-paradox-south-asia.pdf. B. H. Lidel Hart, *Deterrent or Defence* (London: Stevens and Sons, 1960), 23.

395 **„teorija ludaka":** Hari R. Haldeman i Džozef Dimona, *The Ends of Power* (New York: Times Books, 1978), 122. Ovo nije nova ideja. Potiče u najmanju ruku još od Makijavelija. Nikolo Makijaveli, *Discourses on Livy,* knjiga III, 2. poglavlje.

395 **„pretnju koja nešto ostavlja slučaju":** Tomas C. Šeling, *The Strategy of Conflict* (Cambridge, MA: Harvard University Press, 1960).

395 **„Tu postoji pravi problem":** Dejvid Denks, intervju, 13. januar 2017.

396 **„Sistemi autonomnog oružja su novi":** Ibid.

397 **„naprosto sasvim nerazumno i beznadežno optimistički":** Ibid.

397 **„Gospodine predsedniče, vi i mi ne treba sada da":** Stejt department, telegrafska transmisija pisma premijera Hruščova predsedniku Kenediju, 26. oktobar 1962, http://microsites.jfklibrary.org/cmc/oct26/doc4.html.

398 **„Postoje scenariji u kojima":** Has, „Autonomous Weapon Systems."

19 Ratnici kentauri: Ljudi + mašine

401 **Gari Kasparov:** Majk Kasidi, „Centaur Chess Brings out the Best in Humans and Machine", BloomReach, 14. decembar 2014, http://bloomreach.com/2014/12/centaur-chess-brings-best-humans-machine/.

402 **kentaurski šah:** Tajler Kauen, „What are Humans Still Good for? The Turning Point in Freestyle Chess may be Approaching", *Marginal Revolution*, 5. novembar 2013, http://marginalrevolution.com/marginalrevolution/2013/11/

what-are-humans-still-good-for-the-turning-point-in-freestyle--chess-may-be-approaching.html.

402 „**17. aprila 1999“:** Mike Pjetruha, „Why the Next Fighter will be Manned, and the One After That“, *War on the Rocks,* 5. avgust 2015, http://warontherocks.com/2015/08/why-the-next-fighter-will-be--manned-and-the-one-after-that/.

403 **Komercijalni avioni koriste automatizaciju:** MeriKamings i Aleksander Stimpson, „Full Auto Pilot: Is it Really Necessary to Have a Human in the Cockpit?“,*Japan Today*, 20. maj 2015, http://www.japantoday.com/category/opinions/view/full-auto-pilot-is-it-really-necessary-to-have-a-human-in-the-cockpit.

404 **„Sektor bez dejstvovanja“:** Majk Van Rasen, „Counter-Rocket, Artillery, Mortar (C-RAM)“, Program Executive Office Missiles and Space, pristup16. juna 2017, Slide 28, http://www.msl.army.mil/Documents/Briefings/C-RAM/C-RAM%20Program%20Overview.pdf.

404 **„Ljudski rukovalac ne cilja niti vrši“:** Sem Volas, „The Proposed Ban on Offensive Autonomous Weapons is Unrealistic and Dangerous“, Kurzweilai, 5. avgust 2015, http://www.kurzweilai.net/the-proposed-ban-on-offensive-autonomous-weapons-is-unrealistic-and-dangerous.

405 **„neosnovane i nekritičke vere u automatizaciju“:** Hauli, „Not by Widgets Alone.“

406 **čovek ne pridodaje nikakvu vrednost:** S obzirom na nedavni napredak u mašinskom učenju, moguće je da smo sada na toj tačci. U decembru 2017, kompanija za istraživanje VI *DeepMind* otkrila je *AlphaZero*, jedan jedini algoritam koji je postigao nadljudsko igranje šaha, *goa* i japanske strateške igrešogi. Za samo četiri sata igre sa samim sobom i bez podataka za obuku, *AlphaZero* je zasenio prethodno najbolji šahovski program. Metod koji stoji iza *AlphaZero*, duboko ojačano učenje, izgleda toliko moćno je da malo verovatno da ljudi mogu pridodati bilo kakvu vrednost kao članovi „kentaurskog“ tima čovek-mašina za ove igre. Tajler Kauen, „The Age of the Centaur Is *Over* Skynet Goes Live“, MarginalRevolution.com, 7. decembar 2017, http://marginalrevolution.com/marginalrevolution/2017/12/the-age-of-the-centaur-is-over.html. Dejvid Silver idr., „Mastering Chess and Shogi by Self-Play with a General Reinforcement Learning Algorithm“,5. decembar 2017, https://arxiv.org/pdf/1712.01815.pdf.

406 **kako kompjuteri budu napredovali:** Kauen, „What Are Humans Still Good For?“

408 **komunikacionu tehnologiju otpornu na ometanje:** Sejler, „Talk Stealthy to Me.“ Pol Šar, „Yes, Unmanned Aircraft Are The Future“, *War on the Rocks,* 11. avgust 2015, https://warontherocks.com/2015/08/yes-unmanned-combat-aircraft-are-the-future/.Ejmi Batler, „5th-To-4th Gen Fighter Comms Competition Eyed In Fiscal 2015“,*Aviation Week Network*, 18. jun 2014, http://aviationweek.com/defense/5th-4th-gen-fighter-comms-competition-eyed-fiscal-2015.

411 **„Koju aplikaciju pokušavamo da rešimo?“:** Piter Galuc, intervju, 15. jul 2016.

411 **„Ako ono ne postoji“:** Džodi Vilijams, intervju, 27. oktobar 2016.

411 „**uzajamno uzdržavanje“:** Evan Akerman, „We Should Not Ban 'Killer Robots,' and Here's Why“, *IEEE Spectrum: Technology, Engineering, and Science News*, 29. jul 2015, http://spectrum.ieee.org/automaton/robotics/artificial-intelligence/we-should-not-ban-killer-robots.

20 Papa i samostrel: Mešana istorija kontrole nad naoružanjem

412 **„Danas je ključno pitanje za čovečanstvo“:** „Autonomous Weapons: An Open Letter From AI & Robotics Researchers.“

414 **Da li će zabrana biti uspešna ili ne:** Za analizu toga zašto neke zabrane oružja funkcionišu, a neke ne, videti: Rebeka Krutof, http://isp.yale.edu/sites/default/files/publications/killer_robots_are_here_final_version.pdf; Šon Vots, „Autonomous Weapons: Regulation Tolerant or Regulation Resistant?“ *Temple International & Comparative Law Journal* 30 (1), proleće 2016, 177–187; i Rebeka Krutof, https://www.lawfareblog.com/why-prohibition-permanently-blinding-lasers-poor-precedent-ban-autonomous-weapon-sistems.

422 **„najmoćnija ograničenja“:** Šeling, *Arms and Influence*, 164.

422 **„Izvesna količina gasa“ pokreće komplikovana pitanja:** Tomas C. Šeling, *The Strategy of Conflict* (Cambridge, MA: Harvard University, 1980), 75.

423 **Eskalacija od jednog do drugog koraka:** Šeling ovo iznosi u Arms and Influence u kritici Makamarine doktrine „bez gradova“. Šeling, *Arms and Influence,* 165.

424 **„Ako oni kažu da će napadati“:** „Hitlers Bombenterror: 'Wir Werden Sie Ausradieren,'“ *Spiegel Online*, pristup 1. aprila 2003, http://www.spiegel.de/spiegelspecial/a-290080.html.

424 **Potpune zabrane oružja:** Ovo izgleda ukazuje da ukoliko se laseri u budućim ratovima koriste za svrhe koje ne obuhvataju oslepljivanje i na kraju izazovu slučajno slepilo, brzo će evoluirati u upotrebu za namerno oslepljivanje.

424 „**protivpešadijske kopnene mine“:** Human Rights Watch, „Yemen: Houthi Landmines Claim Civilian Victims“, 8. septembar 2016, https://www.hrw.org/news/2016/09/08/yemen-houthi-landmines-claim-civilian-victims.

425 **SMArt 155 artiljerijske granate:** „Fitzgibbon Wants to Keep SMArt Cluster Shells“, Text, *ABC News*, (29. maj 2008), http://www.abc.net.au/news/2008-05-29/fitzgibbon-wants-to-keep-smart-cluster-shells/2452894.

425 **napada otrovnim glasom kod Ipra:** Džonatan B. Taker, *War of Nerves: Chemical Warfare from World War I to Al-Qaeda* (New York: Pantheon Books, 2006).

425 **ili „s drugim novim metodima“:** Deklaracija (IV,1), o zabrani, na rok od pet godina, lansiranja projektila i eksploziva iz balona, i drugih metoda slične prirode. Hag, 29. jul 1899, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/385ec082b509e76c41256739003e636d/53024c9c9b216ff2c125641e0035be1a?OpenDocument.

425 „**naredili bombardovanje“:** Propisi: Član 25, Konvencija (IV) o poštovanju ratnog prava i običaja na kopnu i njen aneks: Propisi koji se odnose na ratno pravo i običaje na kopnu. Hag, 18. oktobar 1907, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDocument&documentId=D1C251B17210CE8DC12563CD0051678F.

426 **„bombarder će uvek uspeti da se probije.“:** „The bomber will always get through“, Wikipedia, https://en.wikipedia.org/wiki/The_bomber_will_always_get_through.

426 **Sporazum o neširenju nuklearnog oružja:** „Treaty on the Non-Proliferation of Nuclear Weapons (NPT)“, United Nations Office for Disarmament Affairs, https://www.un.org/disarmament/wmd/nuklearno/npt/text, pristup19. juna 2017.

427 **Konvencija o hemijskom oružju:** „Chemical Weapons Convention“, Organisation for the Prohibition of Chemical Weapons, https://www.opcw.org/chemical-weapons-convention/, pristup 19. juna 2017.

427 **INF sporazum:** „Treaty Between the United States of American and the Union of Soviet Socialist Republics on the Elimination of their Intermediate-Range and Shorter-Range Missiles."

427 **START:** „Treaty Between the United States of American and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms", U.S. Department of State, https://www.state.gov/www/global/arms/starthtm/start/start1.html, pristup 19. juna 2017.

427 **Novi START:** „New Start", U.S. Department of State, https://www.state.gov/t/avc/newstart/, pristup 19. juna 2017.

427 **Sporazum o svemiru:** Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

427 **Ekspandirajući meci:** Deklaracija (IV,3) o ekspandirajućim mecima, Hag, 29. jul 1899, https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDocument&documentId=F5FF4D9CA-7E41925C12563CD0051616B.

427 **Ženevski Protokol o gasu:** Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, Geneva, 17. jun 1925, https://ihl-databases.icrc.org/ihl/INTRO/280?OpenDocument.

427 **OKO:** „Konvencija o određenom konvencionalnom oružju", Kancelarija Ujedinjenih nacija za poslove razoružanja, https://www.un.org/disarmament/geneva/ccw/, pristup 19. juna 2017.

427 **SORT:** „Treaty Between the United States of America and the Russian Federation On Strategic Offensive Reductions (The Moscow Treaty)", U.S. Department of State, https://www.state.gov/t/isn/10527.htm, pristup19. juna 2017.

427 **Oružje masovnog uništenja (OMU) u orbiti:** Sporazum o principima kojih će se države pridržavati u istraživanju i korišćenju svemira, uključujući Mesec i druga nebeska tela.

427 **Konvencija o modifikaciji životne sredine:** Konvencija o zabrani vojne ili bilo koje druge neprijateljske primene tehnika za modifikaciju životne sredine.

427 **Konvencija o biološkom oružju:** „The Biological Weapons Convention", United Nations Office for Disarmament Affairs, https://www.un.org/disarmament/wmd/bio/, pristup 19. juna 2017.

427 **program tajnog biološkog oružja:** Tim Viner, „Soviet Defector Warns of Biological Weapon", *New York Times*, 24. februar 1998. Milton

Lajtenberg, Rejmond A. Zilinskas i Jens H. Kun, *The Soviet Biological* Weapons *Program: A History* (Cambridge: Harvard University Press, 2012). Ken Alibek, *Biohazard: The Chilling True Story of the Largest Covert Biological Weapon Program in the World* (Delta, 2000). Rejmond A. Zilinskas, „The Soviet Biological Weapons Program and Its Legacy in Today's Russia", CSWMD Occasional Paper 11, 18. jul 2016.

427 **Druga oružja mogu biti:** Nedostatak režima verifikacije već je dugo briga u vezi s Konvencijom o biološkom oružju. „Biological Weapons Convention (BWC) Compliance Protocol", NTI, 1. avgust 2001, http://www.nti.org/analysis/articles/biological-weapons-convention-bwc/. „The Biological Weapons Convention: Proceeding without a Verification Protocol",*Bulletin of the Atomic Scientists*, 9. maj 2011, http://thebulletin.org/biological-weapons-convention--proceeding-without-verification-protocol.

21 Da li je autonomno oružje neizbežno?: Potraga za smrtonosnim zakonima robotike

429 **Konvencija o određenom konvencionalnom oružju (OKO):** „2014 Meeting of Experts on LAWS", The United Nations Office at Geneva, http://www.unog.ch/__80256ee600585943.nsf/(httpPages)/a038dea1da906f9dc1257dd90042e261?OpenDocument&ExpandSection=1#_Section1. „2015 Meeting of Experts on LAWS", The United Nations Office at Geneva, http://www.unog.ch/80256EE600585943/(httpPages)/6CE049BE22EC75A2C1257C8D00513E26?OpenDocument; „2016 Meeting of Experts on LAWS", The United Nations Office at Geneva, http://www.unog.ch/80256EE600585943/(httpPages)/37D51189AC4FB6E1C1257F4D004CAFB2?OpenDocument.

431 **„prikladno učešće čoveka":** OKO, „Report of the 2016 Informal Meeting of Experts on Lethal Autonomous Weapon Sistems (LAWS), 10. jun 2016.

432 **„Koliko je blizu grada":** Šeling, *Arms and Influence,* 165.

432 **„podelom":** Article 36, „Autonomous weapons – the risks of a management by 'partition'", 10. oktobar 2012, http://www.article36.org/processes-and-policy/protection-of-civilians/autonomous-weapons-the-risks-of-a-management-by-partition/.

432 **Kampanja za sprečavanje robota ubica je pozvala:** „A comprehensive, pre-emptive prohibition on the development, production and use

of fully autonomousweapon." The Campaign to Stop Killer Robots, „The Solution", http://www.stopkillerrobots.org/the-solution/.

432 **tehnologija previše difuzna:** Akerman, „We Should Not Ban 'Killer Robots,' and Here's Why."

433 **nije bila pametna strategija kampanje:** Stiv Gus, intervju, 26. oktobar 2016.

434 **mare više o ljudskim pravima:** Ijan Vaskez i Tanja Porcnik, „The Human Freedom Index 2016", Cato Institute, the Fraser Institute, and the Friedrich Naumann Foundation for Freedom, 2016, https://object.cato.org/sites/cato.org/files/čovek-freedom-index-files/čovek-freedom-index-2016.pdf.

434 **„Znate da nećete moći":** Stiv Gus, intervju, 26. oktobar 2016.

435 **Nekoliko stručnjaka održalo je prezentacije:** Na primer, Rikli, „Some Considerations of the Impact of LAWS on International Security: Strategic Stability, Non-State Actors and Future Prospects."

435 **„to nije zaista značajan element":** Džon Bori, intervju, 12. april 2016.

436 **„ofanzivnog autonomnog oružja izvan značajne":** „Ofanzivnog autonomnog oružja izvan značajne : An Open Letter From AI & Robotics Researchers."

437 **„doći do neke vrste":** Bob Vork, intervju, 22. jun 2016.

440 **Ne postoje protivpešadijski ekvivalenti:** Precizno navođeno oružje evoluira do nivoa pešadijske borbe, što obuhvata i laserski navođenu municiju kao DARPA XACTO i Raytheon Spike projektil. Pošto su laserski navođeni, njih i dalje čovek kontroliše daljinski.

440 „**neka mašine ciljaju na mašine":** Kaning, „A Concept of Operations for Armed Autonomous Systems."

441 **u „zaustavljanju trke u naoružavanju":** Stjuart Rasel,Volš Maks Tegmark i Tobi, „Why We Really Should Ban AutonomousWeapons: A Response",*IEEE Spectrum: Tehnologija, Engineering, and Science News*, 3. avgust 2015, http://spectrum.ieee.org/automaton/robotics/artificial-intelligence/why-we-really-should-ban-autonomous-weapon.

443 **fokusiranje na nepromenjivi element u ratu**: MKCK je, na primer, pozvao države da se „fokusiraju na ulogu čoveka u procesu pronalaženja meta". International Committee of the Red Cross, „Views of the International Committee of the Red Cross (ICRC) on autonomousweaponsystem", rad podnet na Konvenciji o određenom konvencionalnom oružju (OKO) Sastanku stručnjaka za

smrtonosne autonomne sisteme naoružanja (SASN), 11. april 2016, 5, dostupno za daunloud na adresi https://www.icrc.org/en/document/views-icrc-autonomous-weapon-system.

443 **Fraze kao „značajna ljudska kontrola“:** Hedher M. Rof i Ričard Mojes, „Meaningful Human Control, Artificial Intelligence and AutonomousWeapons“, Izveštaj pripremljen za Neformalni sastanak stručnjaka za smrtonosne autonomne sisteme naoružanja, Konvencija UN o određenom konvencionalnom oružju, april 2016, http://www.article36.org/wp-content/uploads/2016/04/MHC-AI--and-AWS-FINAL.pdf. Human Rights Watch, „Killer Robots and the Concept of Meaningful HumanControl“, 11. april 2016, https://www.hrw.org/news/2016/04/11/killer-robots-and-concept-meaningful-human-control. UN Institute for Disarmament Research, „The Weaponization of Increasingly Autonomous Technologies: Considering how Meaningful HumanControl might move the discussion forward“, 2014, http://www.unidir.org/files/publications/pdfs/considering-how-meaningful-human-control-might-move--the-discussion-forward-en-615.pdf. Majkl Horovici Pol Šar, „Meaningful Human Control in Weapon Systems: A Primer“, Centar za novu američku bezbednost, Washington DC, 16. mart 2015, https://www.cnas.org/publications/reports/meaningful-human-control--in-weapon-systems-a-primer. CCW, „Report of the 2016 Informal Meeting of Experts on Lethal AutonomousWeaponSystems“.

443 **„ratno pravo koje važi“:** Ministarstvo odbrane, „Department of Defense Law of War Manual“, 330.

Zaključak: Mi smo krojači sopstvene sudbine

446 **Sara i Džon su zauvek uhvaćeni u zamku:** Bravo za Darena Franića zbog pokušaja da mapira vremenske linije *Terminatora*: „'Terminator Genisys': The Franchise Timeline, Explained“,*EW*.co*m*, 30. jun 2015, http://ew.com/article/2015/06/30/terminator-genisys-franchise-timeline-explained/.