Preparing for the Future of Artificial Intelligence

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PREPARING FOR THE FUTURE OF ARTIFICIAL INTELLIGENCE

Executive Office of the President
National Science and Technology Council
Committee on Technology

October 2016

Artificial Intelligence, Automation, and the Economy

Executive Office of the President

December 2016

Anthony Foxx
U.S. Secretary of Transportation
2013-17


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"We're moving into the Jetsons era, but we have Flintstone approaches to authority and regulation and we can't go the distance with this until we really think about things differently."


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Deputy Secretary: Third Offset Strategy Bolsters America's Military Deterrence

By Cheryl Pellerin

DoD News, Defense Media Activity

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WASHINGTON, Oct. 31, 2016 — The Pentagon's Third Offset Strategy pursues next-generation technologies and concepts to assure U.S. military superiority, but the real focus is strengthening U.S. conventional deterrence to make sure wars don't happen, Deputy Defense Secretary Bob Work says.

Deputy Defense Secretary Bob Work speaks at the Center for Strategic and International Studies about the Pentagon's third offset strategy in Washington, D.C., Oct. 28, 2016. DoD photo by Navy Petty Officer 1st Class Tim D. Godbee

He spoke last week at a Center for Strategic and International Studies' event titled, Assessing the Third Offset Strategy. Joining Work during the opening plenary was Air Force Gen. Paul J. Selva, vice chairman of the Joint Chiefs of Staff.

At the forum, defense leaders discussed DoD's drive to identify innovative capabilities that will ensure U.S. military superiority over what the deputy secretary calls "pacing competitors."

Pacing Competitors

Work said the third offset begins by focusing on competitors who are developing advanced capabilities.


NY
500

Department of Defense

DIRECTIVE

NUMBER 3000.09
November 21, 2012

USD(P)

SUBJECT: Autonomy in Weapon Systems

References: See Enclosure 1

1. PURPOSE. This Directive:

a. Establishes DoD policy and assigns responsibilities for the development and use of autonomous and semi-autonomous functions in weapon systems, including manned and unmanned platforms.

b. Establishes guidelines designed to minimize the probability and consequences of failures in autonomous and semi-autonomous weapon systems that could lead to unintended engagements.

2. APPLICABILITY. This Directive:

a. Applies to:

(1) OSD, the Military Departments, the Office of the Chairman of the Joint Chiefs of Staff and the Joint Staff (CJCS), the Combatant Commands, the Office of the Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within the DoD (hereinafter referred to collectively as the "DoD Components").

(2) The design, development, acquisition, testing, fielding, and employment of autonomous and semi-autonomous weapon systems, including guided munitions that can independently select and discriminate targets.

(3) The application of lethal or non-lethal, kinetic or non-kinetic, force by autonomous or semi-autonomous weapon systems.

The New York Times

China's Intelligent Weaponry Gets Smarter

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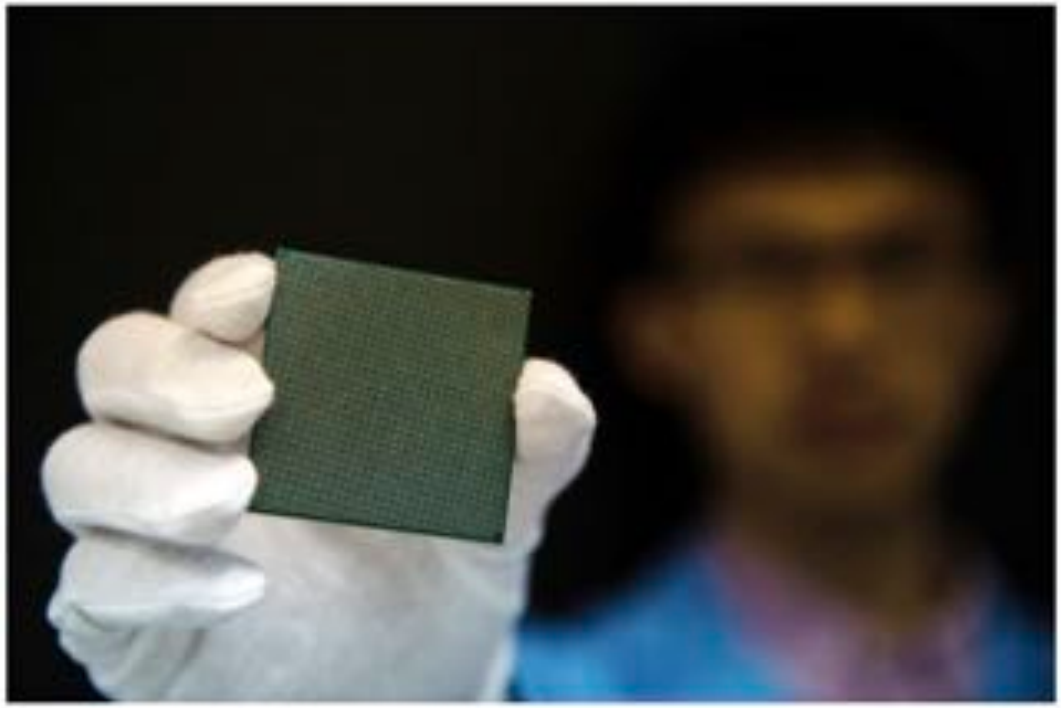
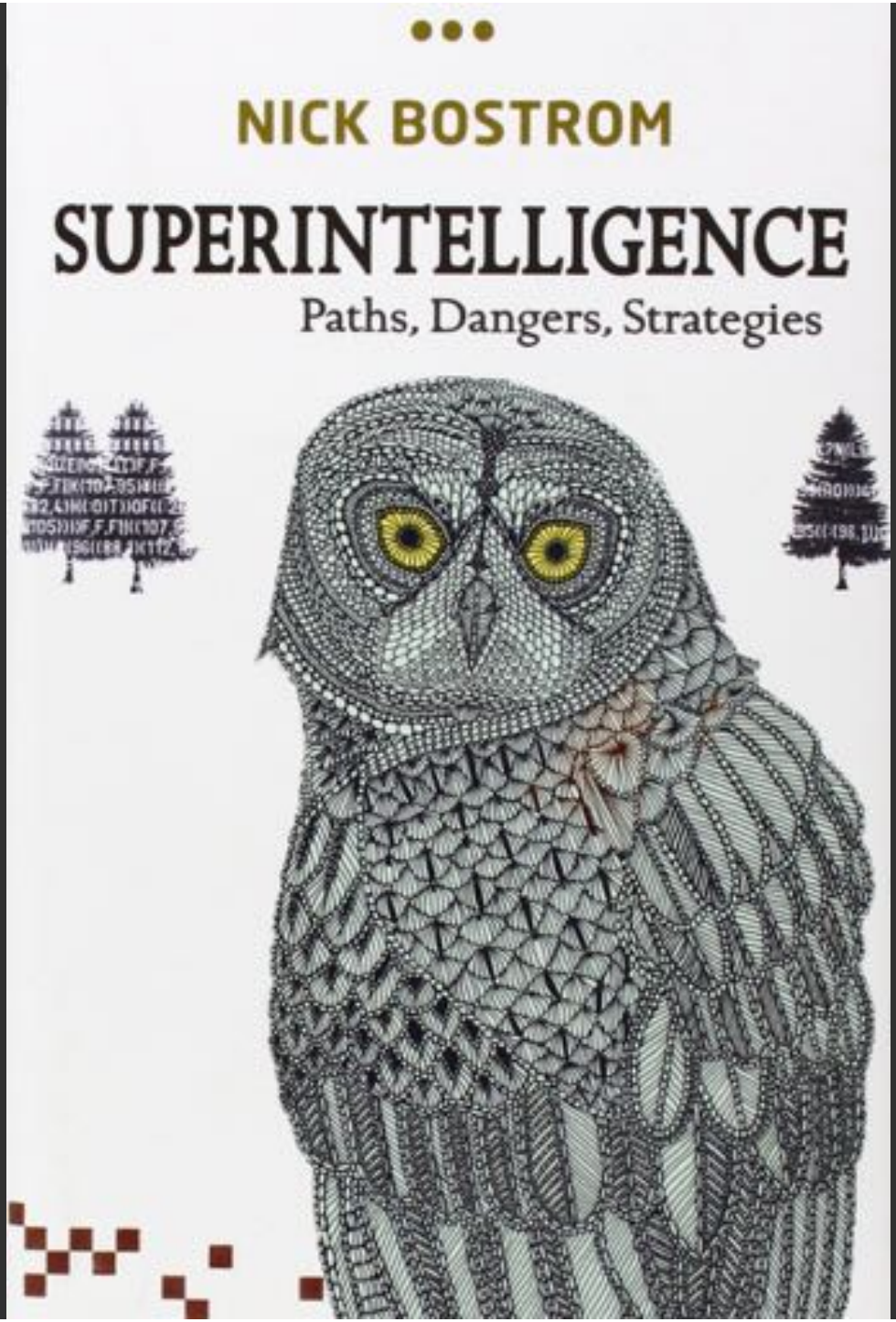
By JOHN MARKOFF and MATTHEW ROSENBERG FEB. 3, 2017



The Chinese-designed multicore processor of the Sunway TaihuLight, the world's fastest supercomputer. The new supercomputer is thought to be part of a broader Chinese push to begin driving innovation.
Li Xiang/Xinhua, via Associated Press

Robert O. Work, the veteran defense official retained as deputy secretary by President Trump, calls them his "A.I. dudes." The breezy moniker belies their serious task: The dudes have been a kitchen cabinet of sorts, and have advised Mr. Work as he has sought to reshape warfare by bringing artificial intelligence to the battlefield.


NICK BOSTROM
SUPERINTELLIGENCE
Paths, Dangers, Strategies

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AI and Free Expression

- Companies using AI/ML to filter content, block unwanted messages, and cancel accounts
- Governments calling on companies to do this more
- What are the implications for free expression and civil rights?

AI and Ethics

- Powerful AI systems raise new questions about whether and when we should rely on automated systems.

- How should we think about AI ethics?
- What can we learn from bioethics and environmental ethics?
- How should we teach ethics to AI students?

Diversifying the AI Workforce

- The AI workforce has even fewer women and people of color than the overall tech workforce.
- What can we do to improve this?

AI and Fairness

- AI/ML are being used increasingly to make consequential decisions about people.
- Algorithms can easily produce biased results, due to non-representative data, importing of past human bias, or statistical effects.

- What can be done to understand and mitigate bias?

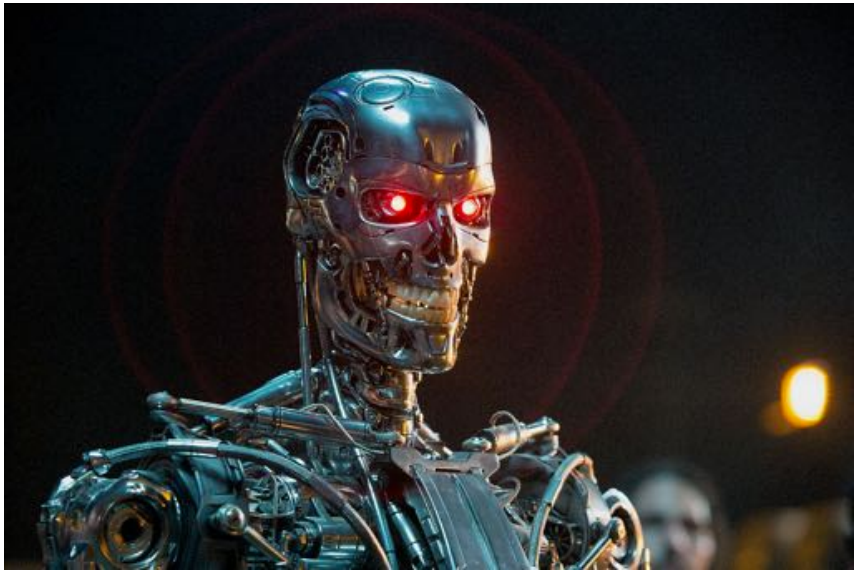
AI and Governance

AI and (Cyber)Security

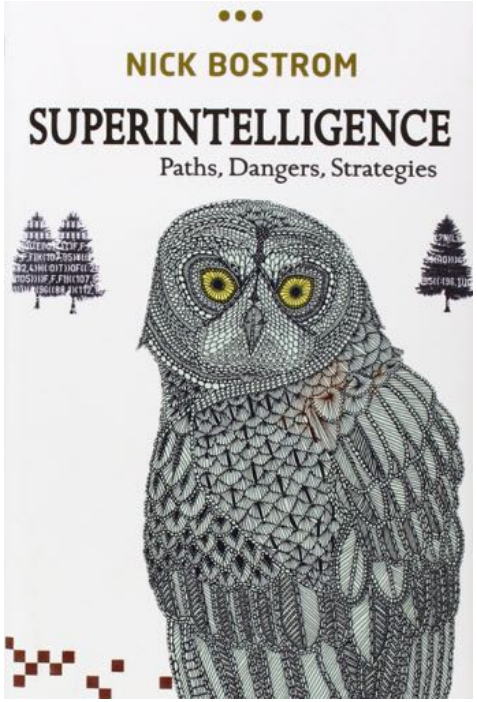
Both attack and defense can be automated.

Attack and defense will operate at machine speed. Only machines will be able to keep up.

AI and National Security



Long-Term Risks



Artificial Intelligence, Automation, and the Economy

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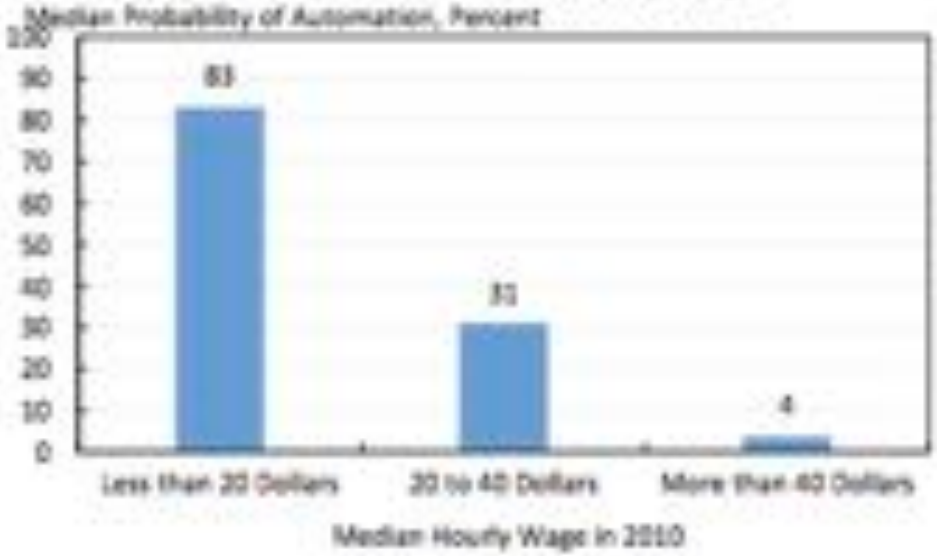
Although it is difficult to predict these economic effects precisely with a high degree of confidence, the economic analysis in the previous chapter suggests that policymakers should prepare for five primary economic effects:

- Positive contributions to aggregate productivity growth;
- Changes in the skills demanded by the job market, including greater demand for higher-level technical skills;
- Uneven distribution of impact, across sectors, wage levels, education levels, job types, and locations;
- Churning of the job market as some jobs disappear while others are created; and
- The loss of jobs for some workers in the short-run, and possibly longer depending on policy responses.

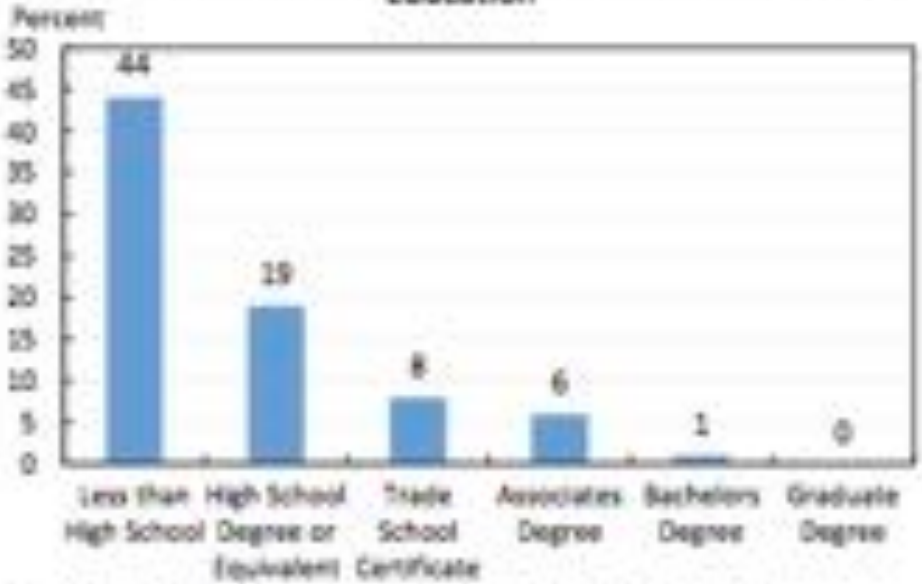
Is this time different?

Figure 3a: Share of Jobs with High Probability of Automation, by Occupation's Median Hourly Wage



Source: Bureau of Labor Statistics, Frey and Osborne (2013), CEA calculations.

Figure 3b: Share of Jobs with Highly Automatable Skills, by Education



Source: Arntz, Gregory, and Zierahn (2016) calculations based on the PIAAC 2012.

Is this time different?

"I agree that our trade should be fair and not just free. But the next wave of economic dislocations won't come from overseas. It will come from the relentless pace of automation that makes a lot of good middle-class jobs obsolete."

farewell address, Chicago, January 10, 2017


FRED
Civilian Labor Force Participation Rate: Men
Civilian Labor Force Participation Rate: Women
Percent
90
80
70
60
50
40
30
1950
1960
1970
1980
1990
2000
2010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