

Notes from the Edge

Insights into an Evolving Future



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HUMANS AND MACHINES

Manned-Unmanned Teaming. Last month, the Futures Assessment Division of the Marine Corps Warfighting Lab held a workshop in the future of manned-unmanned teaming. [We will publish the results of that workshop when they are complete.] Central to the discussion, “Trust” and “morals/ethics” are two hot-button discussion areas which we decided to leave off the table at the workshop because the issues were not going to be resolved in two days at Quantico. In the meantime, to keep those discussions going, we present below a series of articles which will hopefully help educate the reader on the many aspects of the AI ethics discussion.

[Everything You Know About Artificial Intelligence is Wrong](#)

[Why You Should Fear Artificial Intelligence](#)

[When Machines Think and Feel](#)

[Kurzweil: Computers Will Overtake Us When They Learn to Love](#)

[Reading Can Help Robots Learn Ethics](#)

This is the month the robot-controlled future arrived in all its terrifying glory. There is no stopping the future. This month, two of the largest technology companies in the world offered glimpses of the future as they see it — one full of intelligent robots, the other fully immersed in virtual reality. Google-owned Boston Dynamics released a video of a resilient humanoid robot that gets shoved and interfered with repeatedly but recovers to continue its work stocking shelves with boxes. Google reminds us that the era of human like machines capable of doing our jobs is already here. (Never mind the real buried lede: Google just made us feel genuine empathy for cold, skeletal robots). Facebook sees a world highly immersed in virtual reality headsets with the potential to be incredible education tools and useful in treating post-traumatic stress disorder in veterans. [The Robot Future is Here](#)

In Emergencies, Should You Trust a Robot? A Georgia Institute of Technology study has found

that people will follow robots in a simulated emergency, despite evidence that the machine is taking them the wrong way. The study suggests that humans will place an exceptional amount of trust in machines, even when it goes against common sense alternatives and despite the risk of robots malfunctioning. Hence, concluding that people will see robots as "authority figures" that are likely to be trusted in high-pressure emergency environments. The researchers speculate that the pressure of the situation - which participants were led to believe was a real emergency - may have made people more likely to trust the robot. On the other hand, studies in low-pressure situations have shown that people are more likely to be skeptical about robots that have previously shown to be untrustworthy.

[GA Tech: In Emergencies Should you Trust a Robot?](#)

[Telegraph: Humans will Follow a Robot to Their Own Demise](#)

ECONOMICS

Bitcoin: What it is and How it Works. Theory, reality, and understanding of the complex evolution of Bitcoin/blockchain/cryptocurrency and its impact on global economics remain challenging. We will continue our exploration until the NFTE editors think they know how it works.

[Bitcoin: What it is and How it Works](#)

Here's What the Future of Bitcoin Looks Like, and it's Bright! The slew of negative perception surrounding Bitcoin is set to change, much as had been the case of the World Wide Web. The companies built on top of the bitcoin technology have sent over USD\$1 billion in transactions.

[Bright Future for Bitcoin](#)

Securing the City of the Future with Bitcoin. Cities worldwide are hoping to use connected devices to better track and manage everything from traffic to pollution to disaster response. But those plans face the same security challenges as any connected project, and the Austin-based data-security startup Factom is proposing a unique solution: using the digital currency network Bitcoin to reliably date-stamp and authenticate records. [The Future City and Bitcoin](#)

TECHNOLOGY

Eternal data storage demonstrated in nanostructured glass. The quest for high-density immutable storage has taken a big leap forward thanks to "Superman crystals" developed by scientists at the University of Southampton. The glass discs are reportedly capable of storing up to 360 TB/disc of data and will last almost forever at room temperature (or as long as the current 13.8 billion year age of our Universe at 190° C/374° F). Much to the dismay of many, including audiophiles that discarded their vinyl in favor of CDs, conventional digitally-stored data doesn't last forever. Looks like I'll have to buy the White Album again. [Eternal Data Storage in Glass](#)

New 'Machine Unlearning' Technique Wipes Out Unwanted Data Quickly and Completely. Machine learning systems are everywhere. Computer software in these machines predict the weather, forecast earthquakes, provide recommendations based on the books and movies we like and even apply the brakes on our cars when we are not paying attention. To do this, computer systems are programmed to find predictive relationships calculated from the massive amounts of data we supply to them. Two researchers' approach to "unlearning" introduces a layer of a small number of summations between the learning algorithm and its training data to eliminate dependency on each other. Simply re-computing a small number of summations removes the data and its lineage completely, thereby increasing network security and strengthening individual privacy. [Machine Unlearning](#)

Meta-skin could lead to invisibility cloak. Engineers at Iowa State University may have gotten one step closer to the ability to make objects invisible with the development of what they are calling a flexible, stretchable and tunable meta-skin. They have shown that objects wrapped in the meta-skin can

suppress radar detection, and they are hoping to advance the material to eventually make objects undetectable to both visible and infrared light. The meta-skin is so named because it is made of metamaterials (composites not found in nature) that can manipulate electromagnetic waves. The researchers involved in the project point out that the biggest difference in the meta-skin and more traditional stealth technologies that attempt to create a barrier to radar waves, is that the meta-skin has the potential to absorb all of the radar waves, effectively acting like a radar wave sponge.

[Invisibility Cloak](#)

FUTURE OF WORK

Is this the future of work? Scientists predict which jobs will still be open to humans in 2035.

Workers looking for jobs in 2035 might consider retraining as remote-controlled vehicle operators or online chaperones. Those are two of the jobs of the future suggested in a report by the CSIRO that charts 20-year trends in increasingly digitally focused and automated Australian workplaces. The employment minister, Michaelia Cash, released the report on Friday at the Australian Computer Society's conference. Cash said the report showed "some jobs will inevitably become automated over the coming years but technological change will improve others and also create new jobs and opportunities".

"The future won't be about people competing with machines, it will be about people using machines and doing work that is more interesting and fulfilling," she said.

The report identifies six mega-trends in the workforce, the most important of which is an "explosion in device connectivity, data volumes, and computing speed. This, combined with rapid advances in automated systems and artificial intelligence, means that robotic devices can perform many tasks more quickly, safely and efficiently than humans." [Work: 2035](#)

The Office of the Future Will Be Natural, Chair-less, and Designed for Collaboration. If you are sitting in a soul-sucking cubicle reading this, things are looking up! [The Office of the Future](#)

No Water, No Jobs: How Water Shortages Threaten Jobs and Growth. An estimated three out of four jobs globally are dependent on water, meaning that shortages and lack of access are likely to limit economic growth in the coming decades. About 1.5 billion people, half the world's workers, are employed in industries heavily dependent on water, most of them in farming, fisheries, and forestry the U.N. World Water Development Report 2016 says. There is a direct effect on jobs worldwide if there are disruptions in water supply through natural causes, such as droughts, or if water doesn't get to communities because of infrastructure problems. Research has shown that investments in water treatment facilities or even small-scale systems that bring water to fields to irrigate creates a multiplier effect where jobs are created because water becomes available. [Water and Jobs](#)

Retiring at 77? Surely We Should Strive to Work Less. Owen Jones, of The Guardian, suggests that longer life expectancy will inevitably lead to later retirement ages. According to the pensions company Royal London; retirement age could even be up to 81 years old in some parts of Britain. Therefore, the author postulates that we should be aspiring to a more balanced life. He highlights Nick Srnicek and Alex Williams's compelling book, *Inventing the Future* that visions a society where our lives no longer revolve around work. It was presumed that advances in technology would reduce the need for human labor. These threats to the job market may subsequently turn into opportunities as well. [Striving to Work Less](#)

SOCIAL

Gambling and Social Media. Like so many other aspects of our lives, gambling too has moved online, particularly over the last decade. Little is known about how the rise of social media, and more broadly the digital world, has changed gambling and those that do it: how it is promoted, the norms and beliefs

that people have about gambling, the kinds of conversations about gambling that take place, and the kinds of communities of gambling enthusiasts that form online. Especially unclear is whether social media is either promoting or confronting problematic and harmful gambling behaviors.

Evolution of the online life of the future Marine will prove ever increasingly hazardous and challenge future leadership.

Key findings from the DEMOS paper linked below are:

- Gambling seems an important part of online life.
- Online gambling communities have formed with distinct interests and influences.
- Some online communities seem to entrench gambling as a natural part of sports appreciation.
- Some users seemed to use the platforms studied in a way that could facilitate harmful gambling behavior.
- Gambling care online focuses on providing a place for people to seek help when they needed it, rather than reaching those who were not actively seeking help.
- Social media has allowed new forms of gambling and the promotion of it to emerge.

[Gambling and Social Media](#)

MARINE CORPS SECURITY ENVIRONMENT FORECAST

The **2015 Marine Corps Security Environment Forecast: Futures 2030-2045** as announced in [MARADMIN 387/15](#) is open for public release and is available for download at the FAD website. Coming this summer FAD will publish a supplement to the MCSEF. We look forward to bringing that to you.

[Futures Assessment Division](#)



ART OF FUTURE WARFARE PROJECT

The Atlantic Council's Art of Future Warfare Project seeks to cultivate a community of interest in works and ideas arising from the intersection of creativity and expectations about how emerging antagonists, disruptive technologies, and novel warfighting concepts may animate tomorrow's conflicts. Last month, The Project partnered with the FAD to host a Science Fiction Futures Workshop in Quantico, Virginia. Published authors Max Brooks, Charles E. Gannon, and August Cole, worked with 18 talented science fiction writers from across the services, with the goal of bringing to life the future worlds described in the 2015 MCSEF. Follow the hyperlink to Art of Future Warfare Project's website.

[Art of Future Warfare](#)



This newsletter is intended to highlight issues and ideas which may prove significant in the evolving future. In keeping with our focus on both alternative futures and analysis, items in this bulletin will generally be of an alternative nature, or drawn from atypical sources.