Harnessing AI Conclusions

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Our Objectives

- Dimensions of AI
  - Machine learning hierarchy
  - Implementation in key domains
  - Strategy and risks

- Strengths and limitations

- Achieve reliability and responsible use

- The new face of battle

- See through the hype

Focal Points of Hype

- "Machines are intelligent"

- "Dramatic breakthroughs in applications"

- "Programming is dead, long live learning"

- "Big data enables AI"

- "AI confers unbeatable advantage"

- "The good far outweighs the bad"

HYPE: "AI machines are intelligent"

- Rule based logic

- Supervised learning

- Unsupervised learning

- Human-machine teaming

- Aspirational machines

No machine intelligence here

Maybe machine intelligence here -- as yet unknown

HYPE: "Dramatic breakthroughs in applications"

- Data Science
- Management
- Vision
- Cyber security

- Natural language
- Robotics
- Ethics

HYPE: "Programming is dead, long live learning"

- Implementing AI

  - Designing and programming algorithms

  - Teaching from numerous examples

  - Reinforcement simulations

- Good engineering requires all three

HYPE: "Big data enables AI"

- Synergy: Big data and neural networks

- Require huge training sets

  - 100 million labeled images

  - Very expensive to obtain

  - Dubious quality

  - Energy intensive

- A lot of programmed AI

HYPE: "AI confers unbeatable advantages"

- Speed

- Low cost of entry

- Ease of misuse

- Inability to regulate

- Adversarial attacks

HYPE: "AI offers more good than evil"

- Don't need Skynet for bad things to happen

- Adversarial attacks render AI useless in war?

- Slaughterbot scenario?

- Artificial stupidity?

Bed Rock Principles of Implementation

- CDR Brent Spillner in USNI *Proceedings*, July 2019

- Implementations in the field are engineered for reliability, safety, and security
  - Frame realistic expectations
  - Always keep people in the loop
  - Keep roles and limitations clear
  - Design and test to objective standards

Dilemmas

- Fragility
- Intelligibility
- Bias
- Cost of reliable data
- Military uses of AI
- Weapons and control
- Employment and jobs
- Surveillance capitalism
- Decision-making
- Deep fakes
- Speed or (and) resilience

We human operators need to find resolutions. The machines can support resolutions, but cannot find them.

AI Fascination, Distance, Respect

It is easy to become fascinated with the AI technology in and of itself. It is ingenious, clever, and cool.

But fascination with technology creates distance. A distance where others are pixels on a display. A distance that puts war on our screens as a video game, isolating us from its horrors and destruction. A distance that undermines our capacity for respect and increases our fear, anxiety, distrust, and resentment.

As you move forward after this course, be vigilant. Look for AI that helps you do your job better. Do not get lost in AI technology fascination Do not lose sight of AI's weaknesses and limitations. Do not let an AI screen isolate you from understanding and respecting others.