



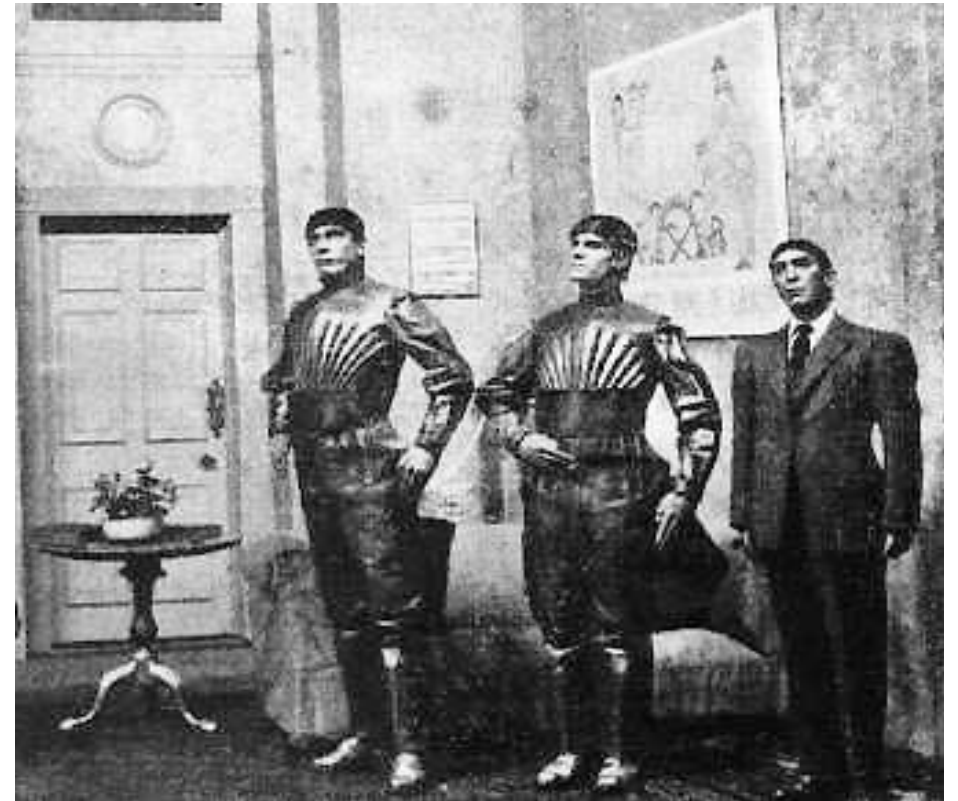
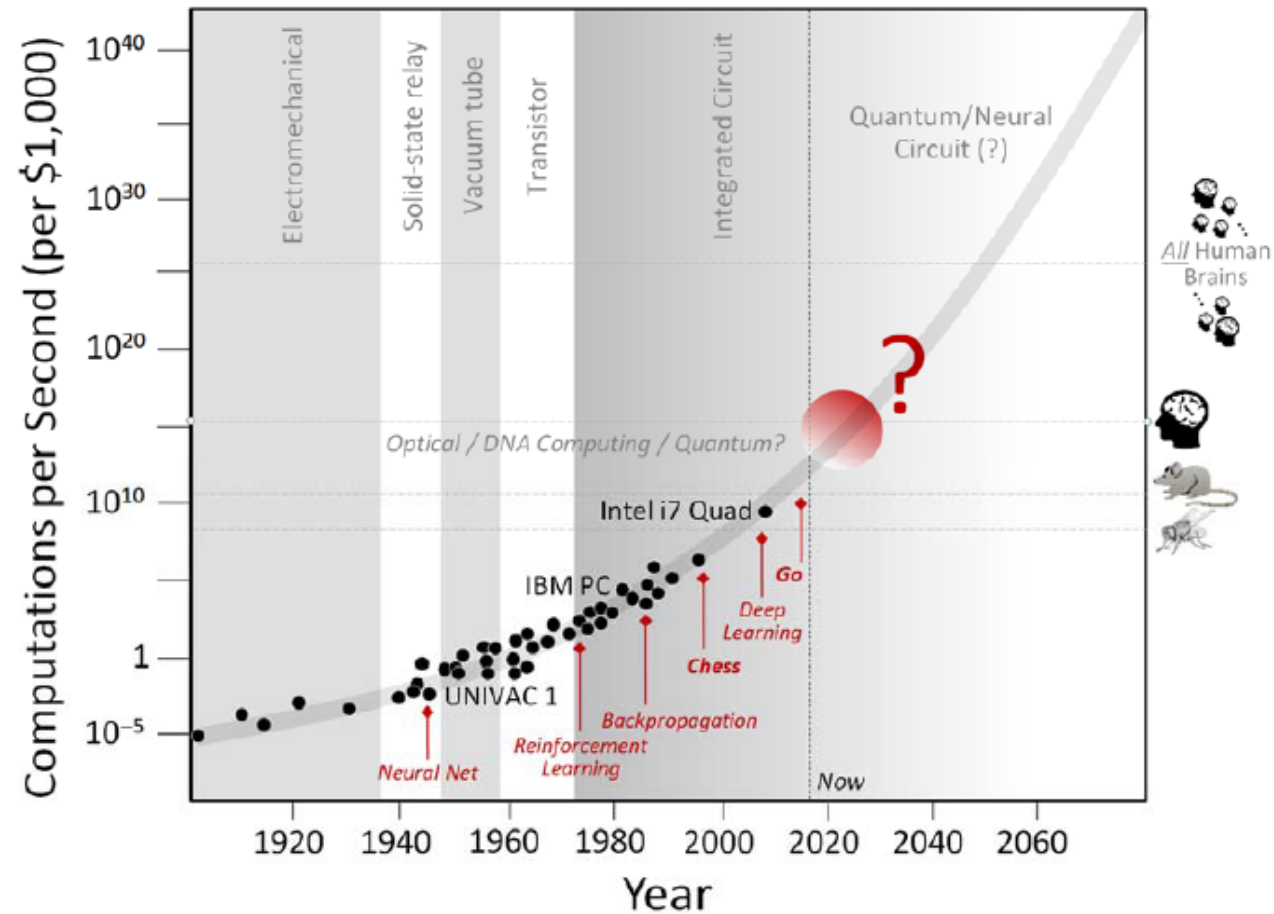
FFI Norwegian Defence
Research Establishment

Machine intelligence and trust:

The implications of AI for joint operations

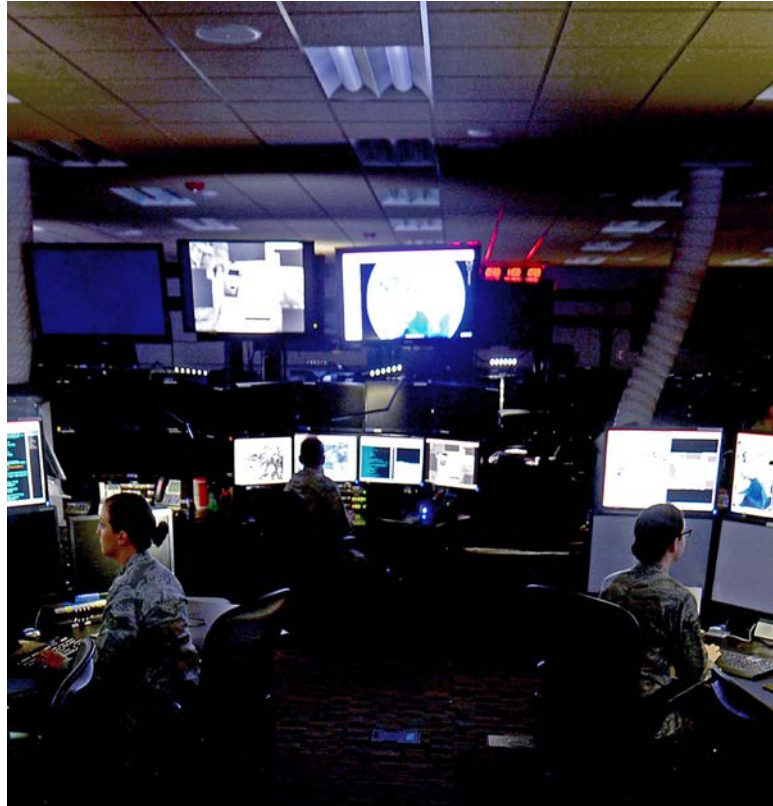
Michael Mayer
Norwegian Defence Research Establishment
NATO OR&A conference 2021

Advances in artificial intelligence



Ref: https://upload.wikimedia.org/wikipedia/commons/d/df/PPTExponentialGrowthof_Computing.jpg

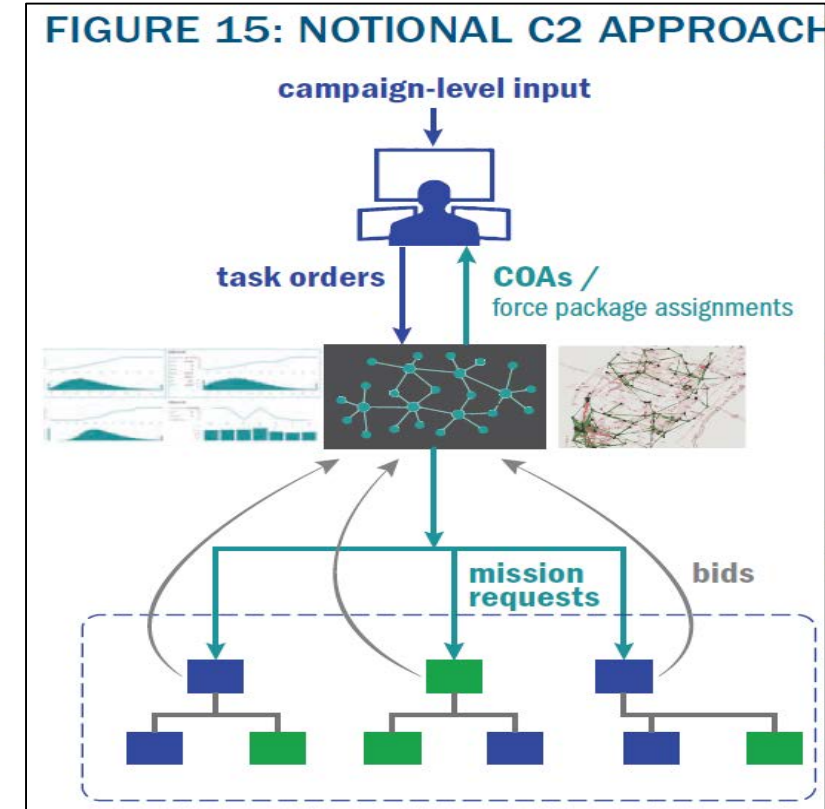
Military applications of AI



Data integration and analysis



Autonomous systems



Decision support & decision-centric warfare

Trust and automation

Trust: «the attitude that an agent will help achieve an individual's goals in a situation characterised by uncertainty and vulnerability»

- Lee & See (2004)

Three-part Trust Model

Dispositional

Culture

Situational

Context

Learned

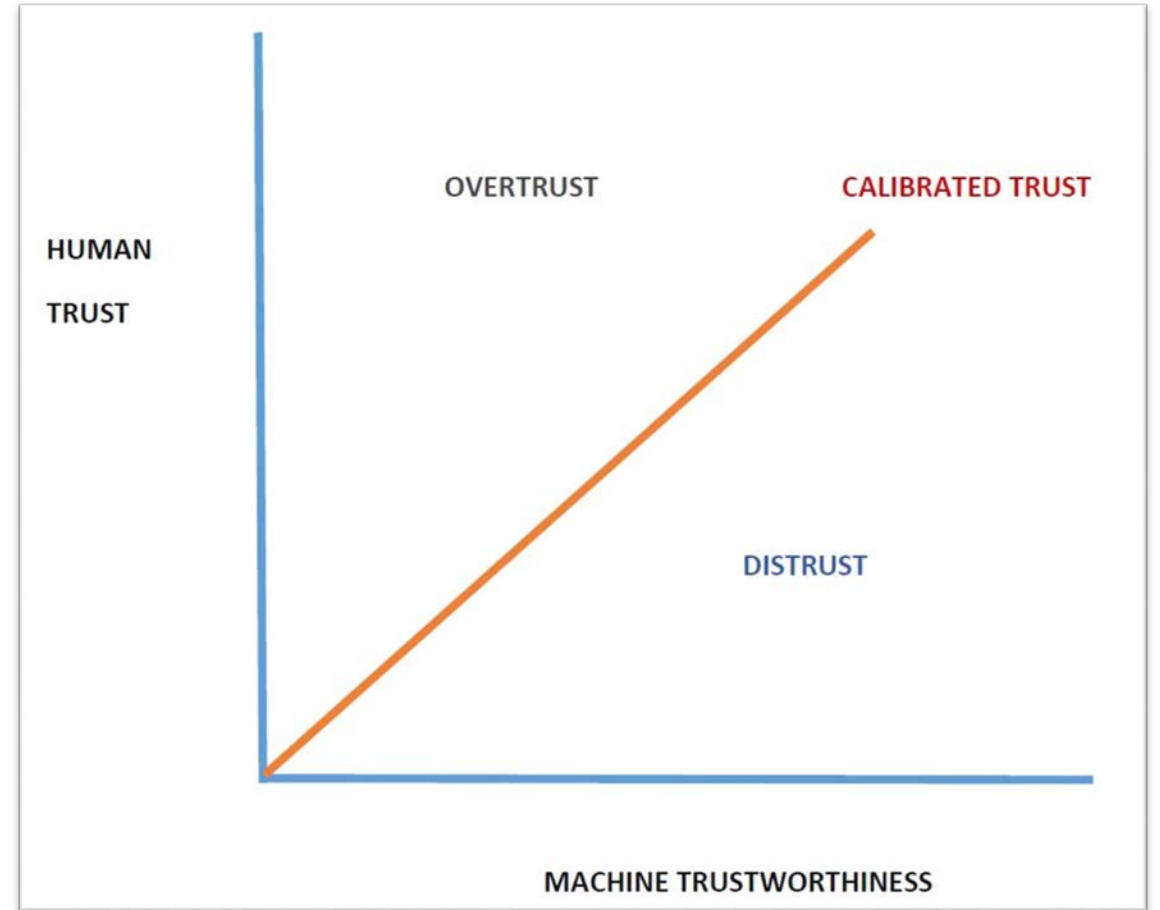
Design



A Soldier of the 25th Infantry Division remote controls a Kobra 710 during the Pacific Manned Unmanned-Initiative (PACMAN-I) at Marine Corps Training Area Bellows, Hawaii, July 22, 2016 (CSBA, Human-machine teaming 2018).

Trust calibration – from distrust to overtrust

- **Distrust**
 - Inefficiency and disuse
- **Overtrust**
 - Complacency
 - Automation bias
- **Calibrated Trust**
 - Appropriate levels of trust for system's abilities



Simplified illustration inspired by Lee & See (2004)

AI and trust calibration on the battlefield

- **Data integration and analysis**
 - Less visible
 - More «automated» than «autonomous»
 - Susceptible to dispositional overtrust → automation bias
- **Autonomous systems**
 - Closer to «autonomous agent»/team member
 - Transparency, communication important
 - Dispositional trust may vary, situational & learned trust is decisive
- **Decision support**
 - Previous two categories factor in here
 - Automation bias tendencies & information bias



Conclusions/ Takeaways

- Machine intelligence has growing relevance for joint operations
- Trust is about a belief to work towards common goals under uncertainty and risk
- AI relevant for data integration/analysis, autonomous systems, and decision-centric warfare
- Proper trust calibration varies across these three types of applications
- Keys are training, education, HAT communication, and design features such as transparency, user interface, and «self-confidence» indicators



US Army illustration



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