

People and Technology Symbiosis

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Format:

Questions

- *Needed Technologies, Systems, Models, Disciplines*

Understanding a Human's Perception, Intention, Context

1. What technologies can improve a machine's ability to perceive a human's position, mood, attitude?
 - *Big data analytics*
 - *Context data analytics*
 - *Advanced sensors*
2. What technologies can improve a machine's ability to understand a human's intent?
 - *Predictive analytics*
 - *Non-verbal communication*
3. What technologies or models can improve a machine's ability to understand a human's context?
 - *Big Data analytics*
 - *Common sense cognition – e.g. Freebase, DBpedia, Watson News*

Understanding a Machine's Perception, Intention, Context

1. What technologies can improve a human's ability to perceive a machine's position, mood, attitude?
2. What technologies can improve a human's ability to understand a machine's intent?
3. What technologies or models can improve a human's ability to understand a machine's context?
 - *MTH communication systems*
 - *MTH communication standards, protocols*
 - *Error trapping, diagnosis and translation*
 - *Human factors*
 - *Affective computing*

Control and Stability

1. What architectures or systems can maintain control over a network of robots?
Consider a network of autonomous MTM interactions with humans on the periphery
 - *Command and control systems*
2. How can a large network of autonomous machines produce a desired emergent outcome without a command and control system?
 - *Swarm intelligence*
 - *Robots fighting*
3. In a large network of machines and humans how can stability be achieved?
Limitations on context awareness
Limitations on intent awareness
Limitations on command and control
 - *Systems science - Models of emergent phenomena*

Wisdom computing

Wisdom (Data > Information > Knowledge > Wisdom)

The power of intuition, ethics, culture on decision making

1. How can wisdom be transferred to machines?
2. How can machines develop their own wisdom?
3. How can machines be controlled by human wisdom?
 - *Wisdom computing*

Maturity level of society wrt AI, Ubiquitous Service Systems

How can human's adapt to the rapid and relentless introduction of AI applications?

- *Design of education in technology, AI*
- *Design of programs for popularizing Service Science and Service Innovation*
- *Design of innovative campaigns to instigate and control the debate about the implications of new technologies and systems*
- *STEM to STEAM to SHTEAM*
- *Popularizing T-Shaped learning*
- *Education, Marketing*

Can human's take over when needed? – No!

E.G., The 3 Deadly D's of cockpit automation

- *Distraction*
- *Dependency*
- *Daring*
- *System design/engineering for fail-safe, fault-tolerance, resilience*
- *Standards engineering for safety, recovery*

Challenges of the New Human Identity

1. Human and Non-Human identity
 - How can humans control their identities when connected to technology and service systems that augment their abilities? Will the technologies that we use determine our sense of identity?
 - How can governments or society manage the adaptation of individuals to sudden power, enablement, competition – legal restrictions or comprehensive entitlement?
2. Individual identity blending into network identity
 - When actions, decisions and performance are managed at a network level how should resources and value be distributed? (e.g., driverless cars)
 - What cultural norms may need to be adjusted to live in a world of controlled networks?
3. What governmental structures will be needed to be changed or created to align more accurately with the new class and community identities?
 - *Big Data Analytics*
 - *Sociology*
 - *Psychology*
 - *Economics*

Social Complexity

What changes will take place in society and in economies as networks form, change and die?

How can societies and governments address the phenomenon of narrowing of political views as a result of the leveraging of networking?

When and how should technology be forced on humans? How can individuals maintain a right to “go native”?

How can societies and governments manage the class effects that will come from the adoption of empowering technologies (legal restrictions or comprehensive entitlement)?

How can individuals adapt sudden power, enablement, competitive advantage that comes from technology adoption?

- *Political science*
- *Economics*
- *Sociology*
- *Psychology*

Humanism

Will we marry robots?

Can robots love, empathize?