Pervasive human-computer mingling and complex socio-technical systems

2023 IFIP WG10.4 Workshop Panel
"Dependability and Security Challenges in the face of 21st Century Threats and Trends: Industry and Academic Perspectives"

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Challenges of the 21st century?

- **more** of those seen, and often conquered, in 1950-2023

- "more" may create a novel challenge

- **more** IT functions, **more** powerful, critical, complex, interconnected...

- and *more deeply interleaved with human* functions

- most human action/decisions to be supported, informed, conditioned by software
- people often "in charge" with software "support"

People in charge with software support: what can go wrong?

What goes wrong now at times?

- misunderstandings
- dependence: suggestions become orders
- degraded ability to operate autonomously, or act as catch-all-exceptions backup
- "improving" alarm systems degrades human response to emergencies
- un-designed emergent properties from mass use
  - flash crashes in markets
  - political polarisation and Jan 6, 2020
- all of the above open to malicious exploitation

Challenges in "more of the same"?

$\rightarrow$ 100% activities "helped"

- more software "helpers" from unprepared designers, more designs with the known problems:
  requiring "tech transfer", education, legal/political progress

- minds adapt to use (improving) "helpers" well and trust them:
  – designers/regulator need to track fast-evolving minds
  – emergent behaviours from helpers altering multiple parts of people's behavior?
  – unexplored attack surfaces?

- system boundaries (responsibilities of different designers, assessors and authorities): may need to be redefined
- "interdisciplinary" understanding **more** essential