Engaging with Automation at Work

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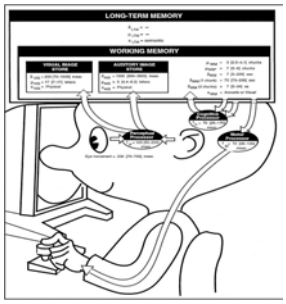
Development of human-computer interaction research



Human Factors
User serves the system
Understandable

Usability
System serves the user
Quick and easy

User experience
User enjoys interaction
Engaging

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Koch, J. et al.: May AI? Design ideation with cooperative contextual bandits. In CHI'19.

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1950's vision of automation in 2000

Engaging with automation

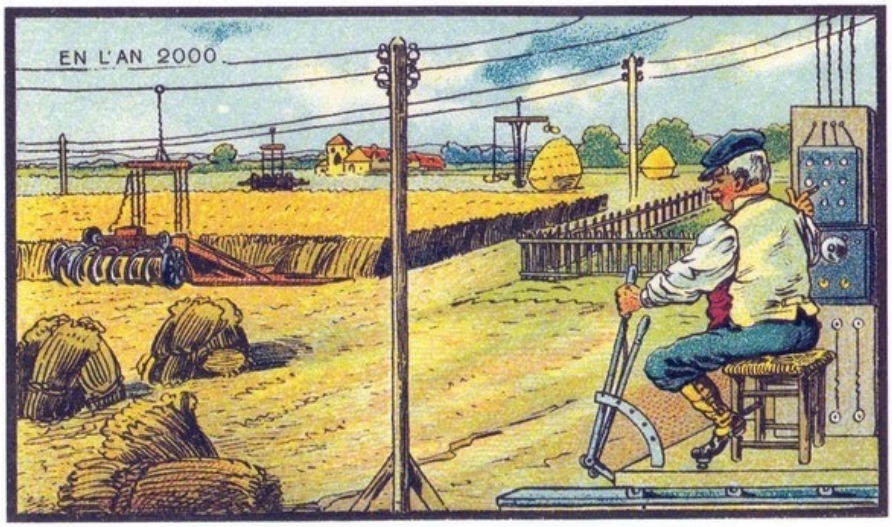
i.e. working with

vigor

dedication

absorption

Schaufeli et al. (2002):
The measurement of engagement…
Journal of Happiness studies



A Very Busy Farmer

https://jacobinmag.com/2021/03/the-utopian-promise-of-self-checkout-machines

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2020's vision of farmer's work

Automation monitoring

Is there

vigor?

dedication?

absorption?

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Monitoring automation - A dead end

Evergreen problems in monitoring work:

Loss of situational awareness

Deskilling

Complacency

Monitoring inefficiency

Still unsolved after 30+ years!

- Strauch, B. (2017). Ironies of automation: Still unresolved after all these years. IEEE Transactions on Human-Machine Systems, 48(5), 419-433.
- Janssen, C. P., Donker, S. F., Brumby, D. P., & Kun, A. L. (2019). History and future of human-automation interaction. IJHCS, 131, 99-107.
- Mouloua, M., Ferraro, J. C., Parasuraman, R., Molloy, R., & Hilburn, B. (2019). Human Monitoring of Automated Systems. *Human Performance in Automated and Autonomous Systems: Emerging Issues and Practical Perspectives, Chapter 1*. CRC Press.

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Human-automation interaction paradigm?

HCI

Human

Command ⇩⇧ Response

Computer

Computer serves human

Engaging HAI Paradigm ?

Human and automation in symbiosis

HAI

Computer

Help! ⇩⇧ Intervention

Human

Human serves computer

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Human-Automation/AI Interaction paradigms

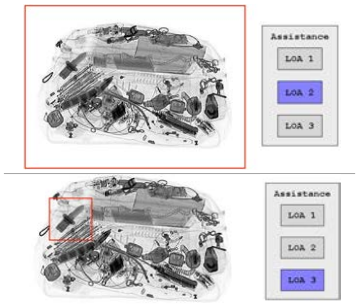
Intervention interaction

Human intervenes automation

Schmidt, A., & Herrmann, T. (2017). Intervention user interfaces: a new interaction paradigm for automated systems. *Interactions*, *24*(5), 40-45.

Adaptable automation

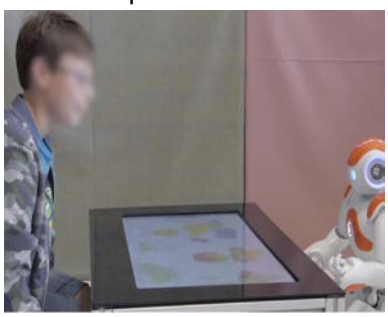
Human chooses level of automation



Chavaillaz, A., Schwaninger, A., Michel, S., & Sauer, J. (2019). Work design for airport security officers: Effects of rest break schedules and adaptable automation. *Applied ergonomics*, *79*, 66-75.

Conversational agents

Human response affects function



Coninx, A. et al. (2016). Towards long-term social child-robot interaction: using multi-activity switching to engage young users. *J. Human-Robot Interaction* 5, 1, 32–67.

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Thank you!

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Take-aways:

- Automation interaction research should proceed to engagement
- Engagement dimensions
  - Vigor, Dedication, Absorption (Schaufeli et al.)
- Drop plans for monitoring UI
- Engaging HAI paradigm still to be found (human –AI symbiosis?)

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