IFE
Institute for Energy Technology
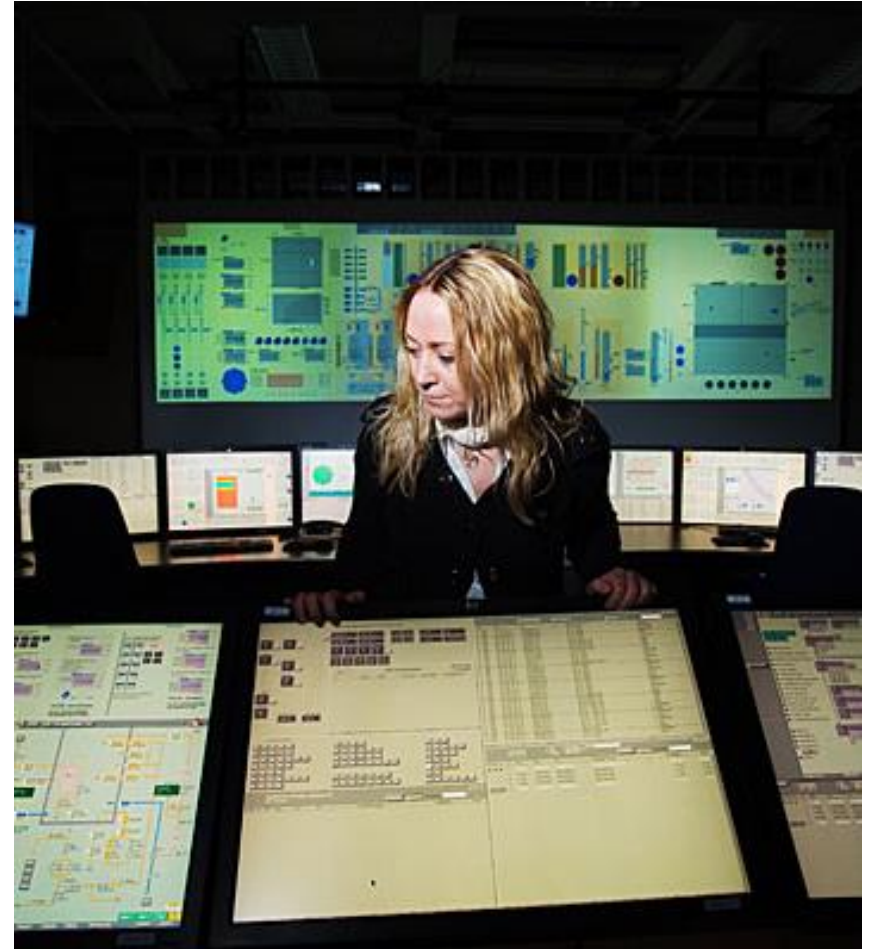
Digitalisation, automation, & robots

What does the future hold for the humans?

Alexandra Fernandes
*Budapest, February 15th 2018*

IFE – Digital Systems

- Knowledge areas
  - **Automation & User Monitoring**
  - Control Room & Interaction Design
  - Human Centered Digitalisation
  - Intelligent Systems
  - Risk, Safety, & Security
  - **Virtual & Augmented Reality**

- Domains of action
  - Energy
    - Nuclear & Petroleum
 - Transport
  - Health
  - Process

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Automation and User Monitoring

- Human-automation interaction in complex operating environments

- Human collaboration with future technologies

- Intelligent user monitoring systems
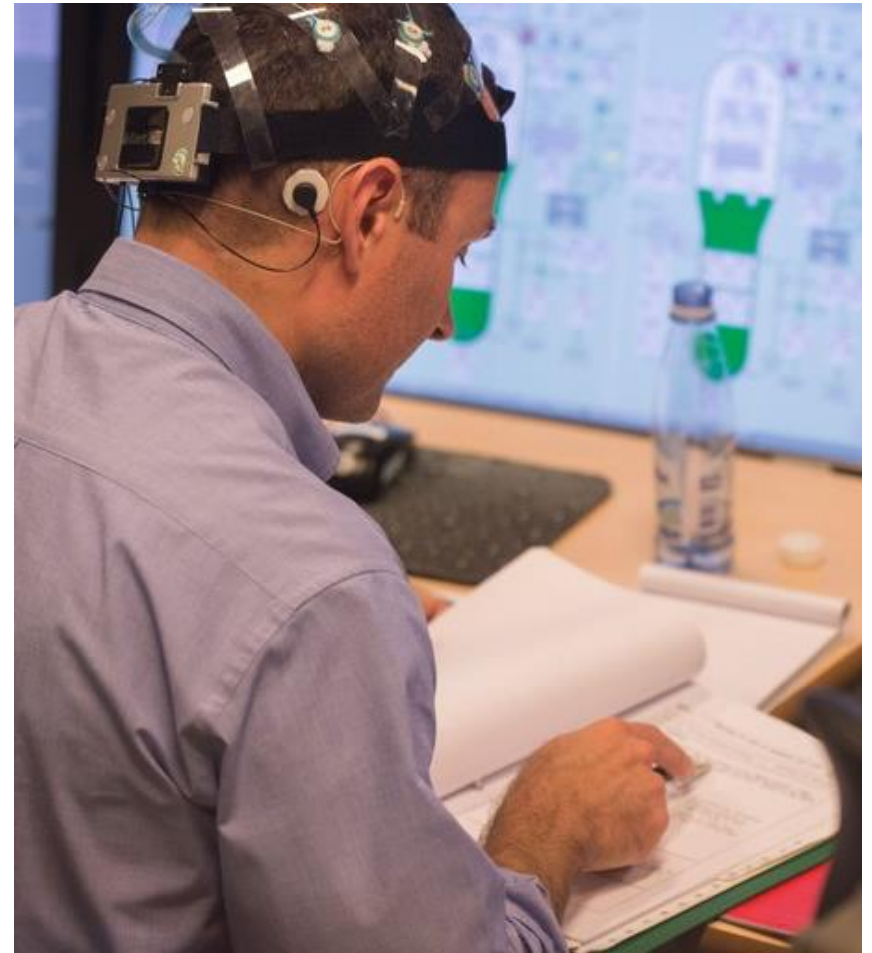
Digitalisation

- Theoretically unlimited design options for the human-system interfaces

- New visualisation possibilities

- Access controls from one computer

- More information available

- Automatisation of tasks is facilitated
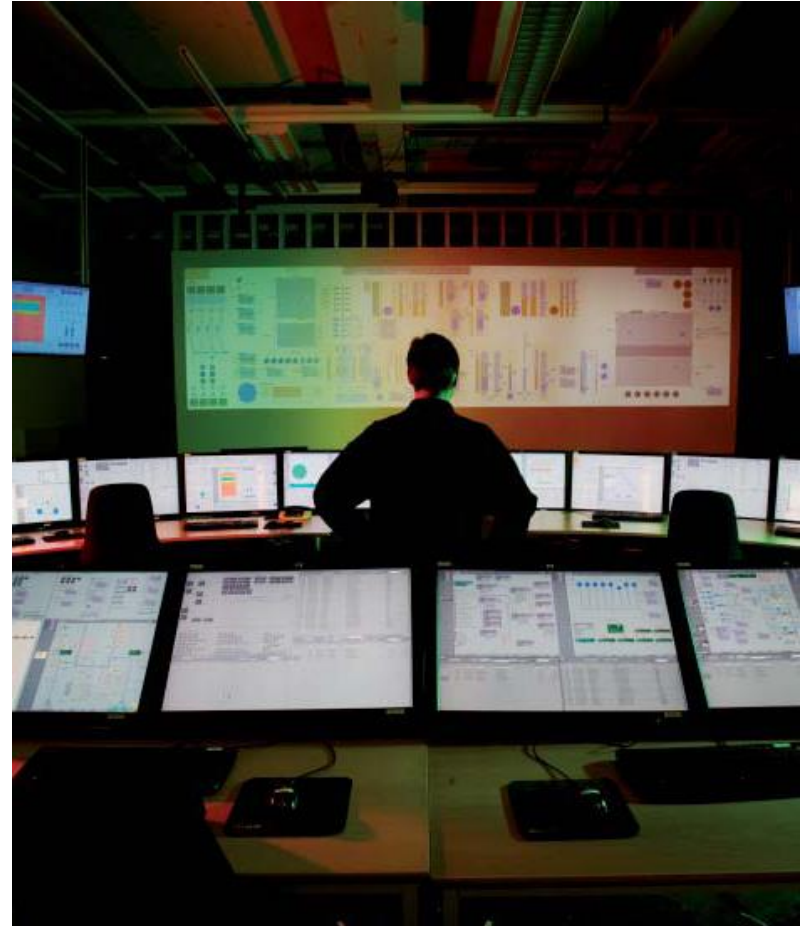
MABA-MABA

- Man Are Better At *versus* Machines Are Better At

  – e.g. Parasuraman et al., 2000

  – Machines are better at precision tasks

  – Human are better at reacting to unexpected events

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Levels of Automation

- Good as a generic theoretical approach

- Limited usefulness in practical contexts

- Inappropriate for high complexity systems

  – Jamieson & Skråning Jr. (2017)

SAE 2014	Description	Example
Level 0	No automation	Driver only
Level 1	Driver Assistance	Cruise control
Level 2	Partial automation	Tesla Autopilot
Level 3	Conditional automation	Audi Traffic Jam pilot
Level 4	High automation	full automation in restricted settings, e.g. speed limit
Level 5	Full automation	Automation only

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Human-Automation Collaboration

- Trust in automation
  - Are we too complacent towards machines?

- Automation transparency
  - Can we actually understand what the systems are doing?

- Human-centred automation
  - Autonomous need to be operated/monitored by humans

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H2020 Adventures (ongoing)

- Widespread

  – Twinning Action (2017)

- Smart, Green and Integrated transport

  – Driver Behavior and acceptance of connected, cooperative and automated transport (MG-3-3-2018)

  – Human factors in transport Safety (MG-2-1-2018)

H2020 Adventures (future)

- Secure societies – Protecting freedom and security of Europe and its citizens

  – Technologies for first responders (SU-DRS02-2018-2019-2020)

  – Deadline 23rd August 2018

H2020 Adventures (future)

- Information and Communication Technologies

  – Robotics core technology

    - Socially cooperative human-robot interaction

  – Deadline: 28th March 2019

H2020 Adventures (future)

- Smart, green and integrated transport

  – Safety in an evolving road mobility environment

  – Deadline 1: 16th January 2019

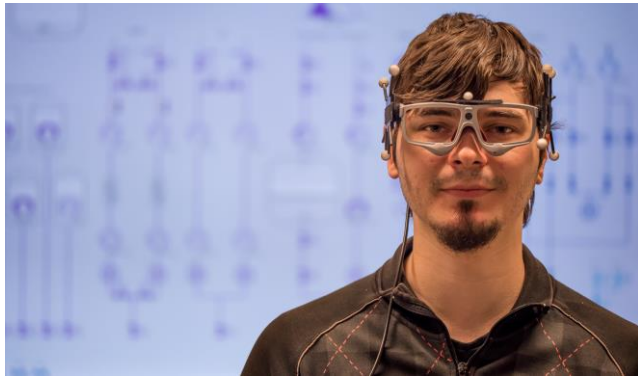 – Deadline 2: 12th September 2019
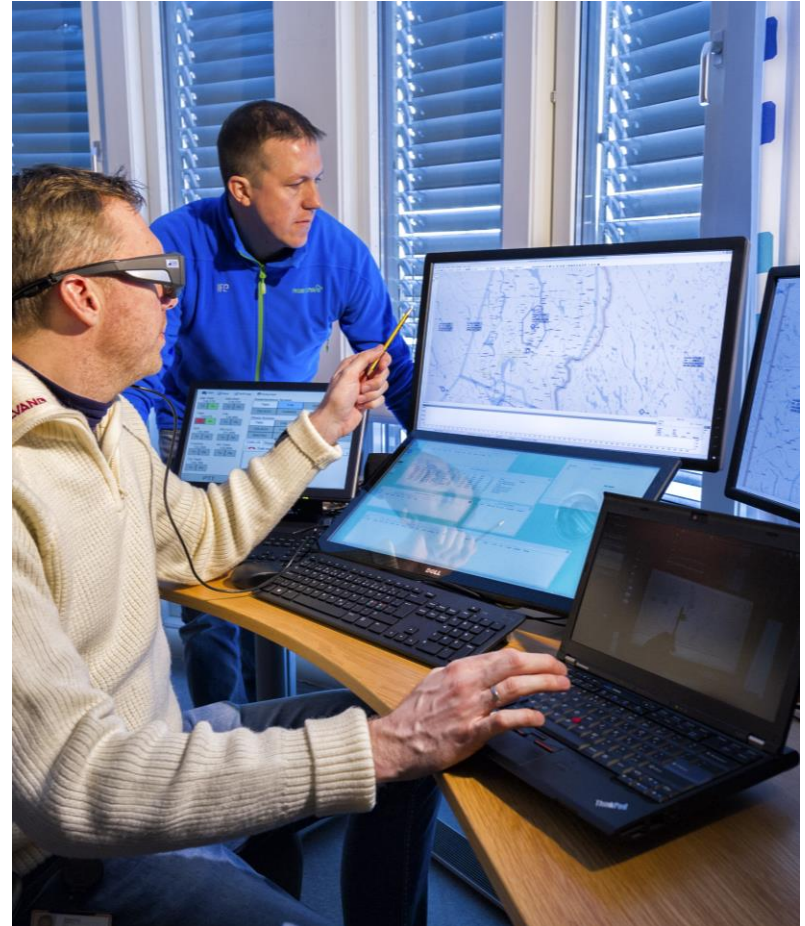
H2020 Adventures (future)

- Smart, green and integrated transport

  – Human centered design for the new driver role in highly automated vehicles

  – Deadline: 24th April 2019

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THANK YOU