LINK-SIC: LINKÖPING CENTER FOR SENSOR INFORMATICS AND CONTROL- CHAIR'S PERSPECTIVE

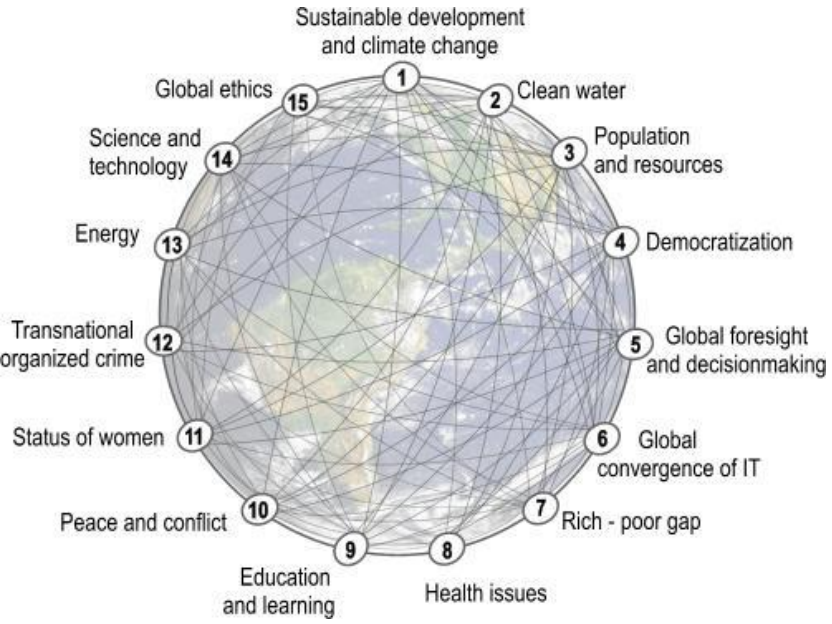
Gunnar Holmberg, Saab and LiU

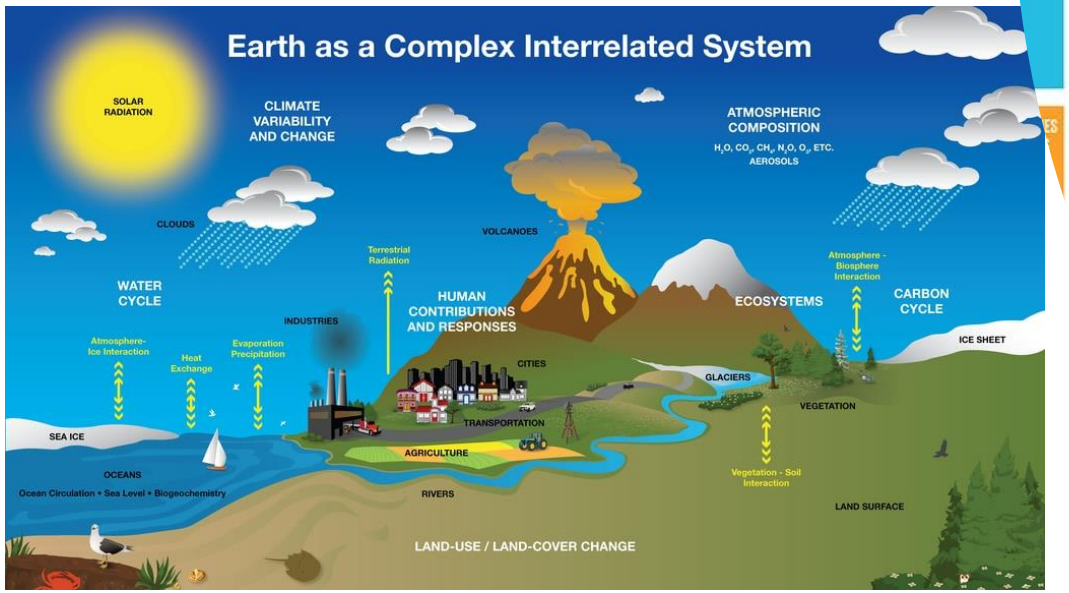
LINK-SIC

Linköping University

The Millenium Project:

Global Challenges 1996-





INTERACTION BETWEEN TWO DIFFERENT VALUE STREAMS

- **Long term competence supply and innovation is key to high tech industry**
- Industry to generate ROI, University to build and spread knowledge, degree of commonality?
- Intellectual Property Rights could be an issue
- Funding is important to gain interest from Universities- but not sufficient
- Universities are driven more by motivation than by contracts- not a normal supplier relation
- Industrial relevance is key for Universities to gain Industry Interest
- **Knowledge Interaction strengthen prospects of long term success for all parties**

LINK-SIC Organization

Strong Industry Involvement

Independent International academic QA

Industry Academia Twinning

2023-11-16 Linköping Center for Sensor Informatics and Control (LINK-SIC)

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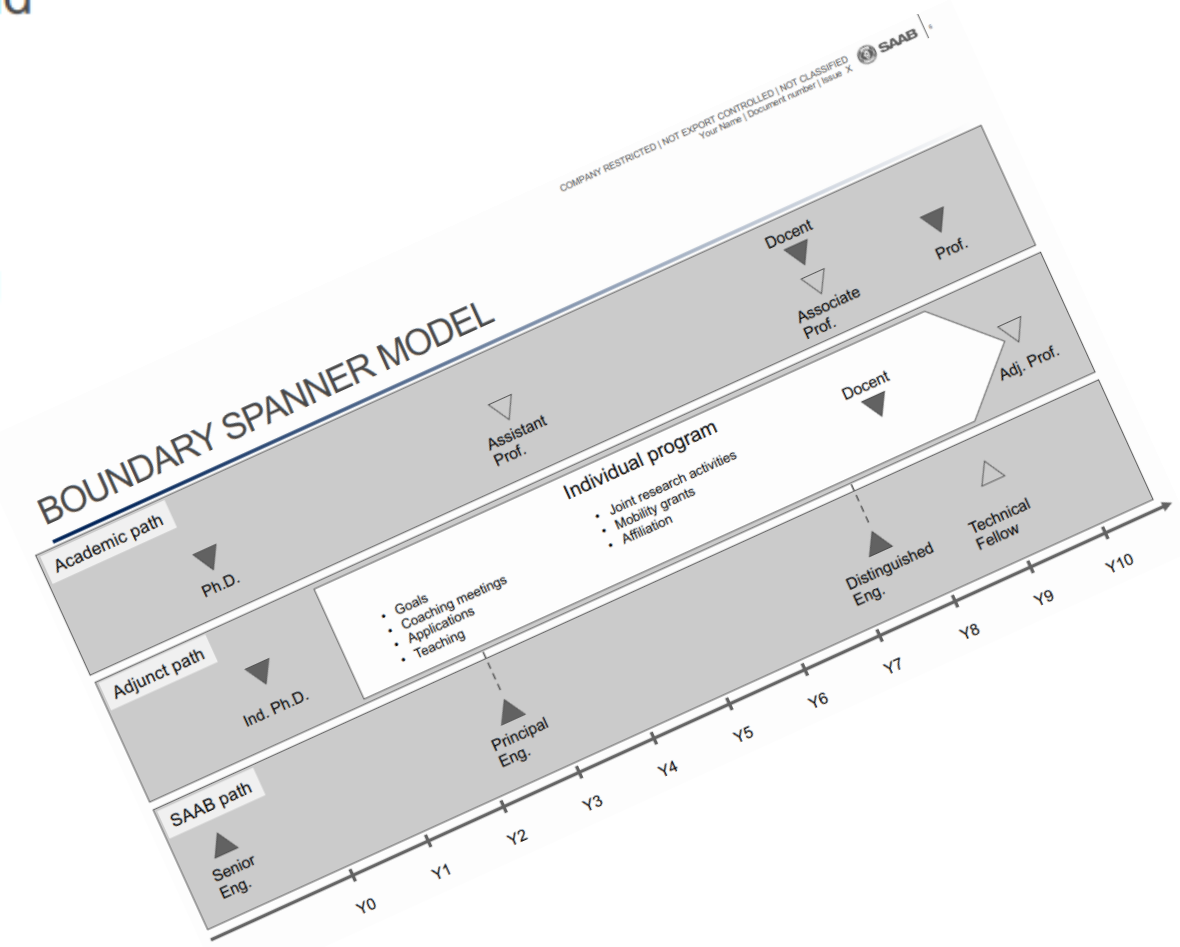
Industrial Researchers

SAAB ENGINEERS SIMPLIFIED

- Engineers and BSc
  - Typically work with a particular set of problems and tasks
- MSc
  - Typically work with more general problems, adapt and evolve throughout the career, often becoming managers at some level
- PhDs
  - Develop new strategies for problem solving
- Life long Boundary Spanners
  - Interact with ecosystem to stimulate evolution support Saabs future needs







Center partners

Linköping University
ABB Corporate Research
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Scania
Atlas Copco Industrial Technique
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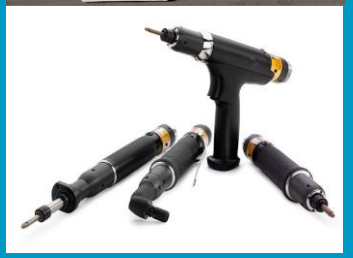


LINKÖPING UNIVERSITY

System of systems

Definition: a set of systems that interact to provide a unique capabili… of its constituent systems (technical, human or organizational) can a… own (ISO 21841)

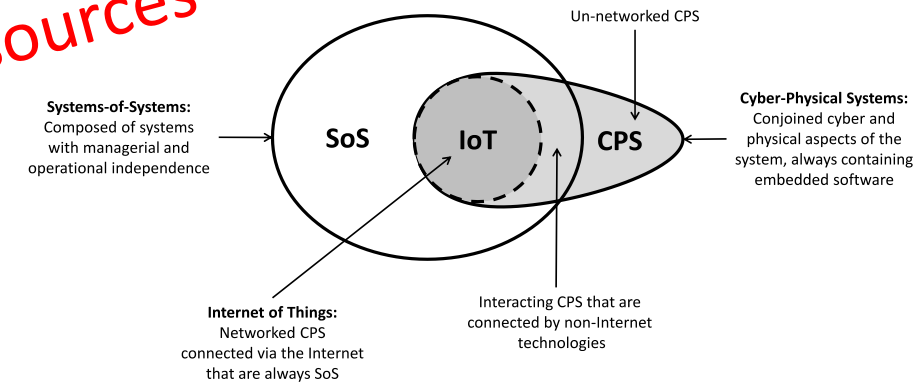
Characterisation: Operational inde… ary development, Emergent beh…

Related t…
IoT (Hens…
Complex i…

”This paper … cyber-physic… originating fr… considerable c… (Henshaw 2016)

- … ems,
- …things. Although …ms and perspectives, there is …ence of the three concepts…”

System of systems is an approach that compared to a System with the same scope Strives to allow for more rapid response to new needs and context dynamics Strives to make better use of resources



Maier, M.W. (1996). Architecting Principles for Systems-of-Systems, INCOSE Boston, US.
Henshaw, M J de C (2016). Systems of Systems, Cyber-Physical Systems, the Internet-of-Things... Whatever Next? OR Insight 19(3):51-54
N. Lakemond, G. Holmberg and A. Pettersson, "Digital Transformation in Complex Systems," in IEEE Transactions on Engineering Management.

Perrow –Normal Accidents Theory (1984)

- A sociological perspective
- Expected that the growing complexity of systems operations would generate increasing amounts of severe accidents due to growing coupling and complexity of operations leading to unforeseeable intricacies…
- Did it happen? Not yet… rather, the worries of complexity has moved from technical systems to focus on e.g. government operations
- One important explanation is the focus on simplifying operation through extensive effort in developing control systems and automation – demanding e.g. more integrated functionality

Perrow, C. (1984), *Normal Accidents. Living with High Risk Technologies*, Basic Books, New York.
Perrow, C. (2004). A personal note on normal accidents. *Organization & environment*, *17*(1), 9-14.

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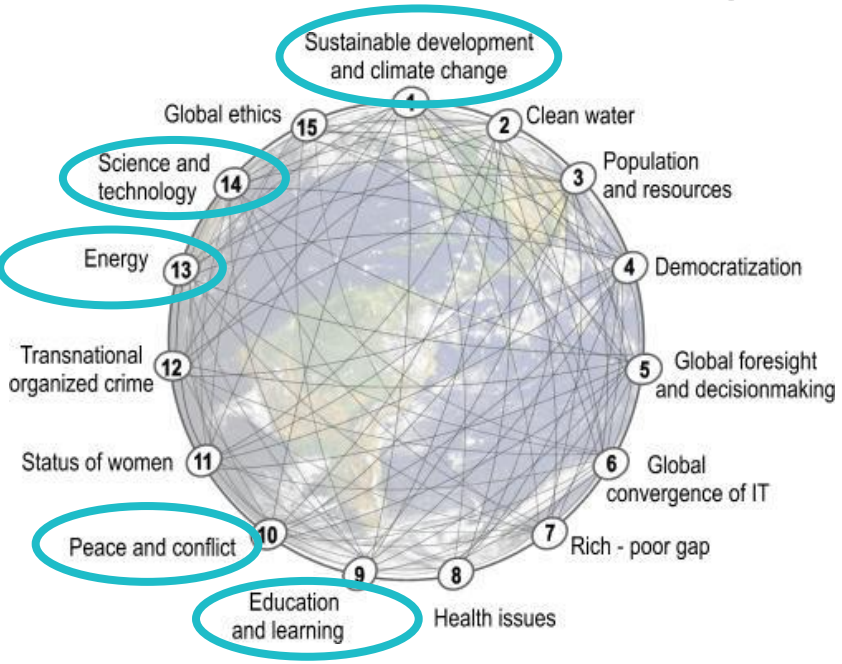

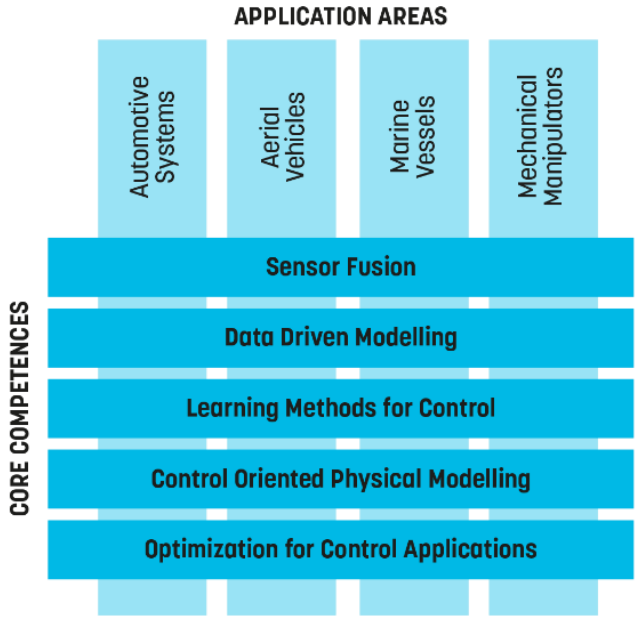

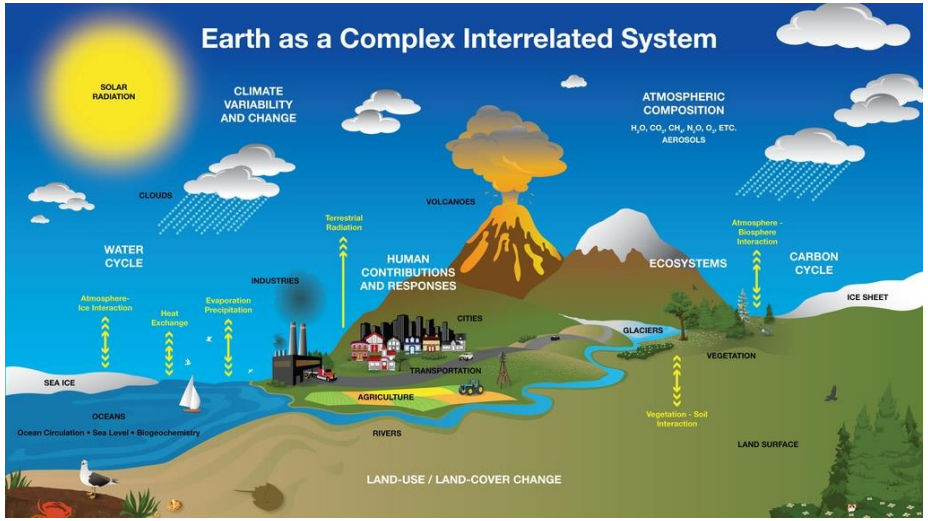

Thanks for listening