



digital futures

Archimedes Stockholm workshop, June 13th 2023

Integrating systems engineering into university education
and research and establishing it in academia

TECOSA





Agenda



09.15-10.15 **Slot 1 – Introductory perspectives**

- **Welcome and workshop introduction** by Martin Törngren, KTH
- **Archimedes introduction** by Wouter Leibbrandt ESI, and Dinesh Verma SERC
- **The Future of Systems Engineering/IncoSE** by Tom Strandberg, CAG Syntell
- **Human Systems Integration** by Pernilla Ulfvengren, KTH

10.15-10.35 Coffee break & mingle

10.35-11.40 **Slot 2**

- **Industrial needs and sustainability concerns** - two talks: Eskil Bendz, AFRY, Anna Pernestål, Skogforsk
- **Educational (best) practices to integrate SE into engineering education** by Bill Shepherd, Stevens Inst. of Techn.
- **University management view on education and systems engineering** by Joakim Lilliesköld, KTH

11.40-12.40 LUNCH

12.40-14.30: **Slot 3 - Group work sessions:** How to introduce SE at Universities, in engineering education and research - incl. coffee break

- **13.30: Intermezzo talk: Systems Engineering Education at the University of Maryland: Undergraduate and Graduate Programs Experiences**, Johan Baras, Univ. of Maryland

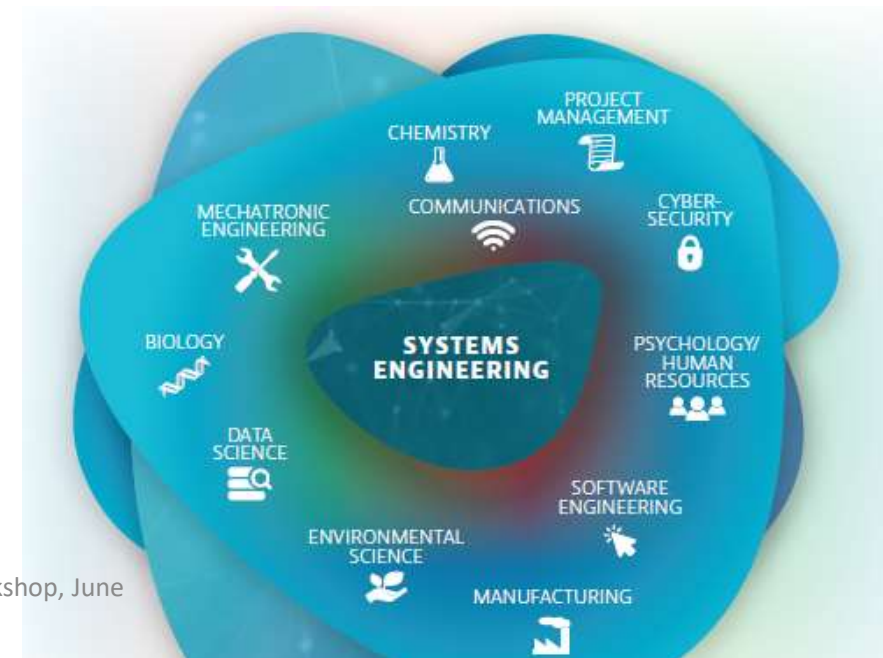
14:30-15:30 **Plenary summaries** from groups and concluding discussion

15:30-16:00 **Next steps**

What is this thing called systems engineering?

“Systems engineering brings stakeholder value while managing growing complexity and risk” (IncoSE vision 2035)

- Dealing with complex socio-technical systems
 - Systems (holistic) thinking
 - Life-cycle, stakeholders, context/environment
 - Human-systems integration
 - Emergence, heterogeneity, dynamics
 - Systemic and systematic development
- T-shaped engineering and beyond





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Martin Törngren, KTH, Archimedes Stockholm workshop, June
2023

SLOT 3 - Group work sessions: How (and why, and where) to introduce SE at Universities

Approach: Divide into smaller breakouts – say 4-5 people. Each group nominates a member to document findings in a digital (online) format – later to be presented

- 3 sessions – nominally 30 mins each – with different groups formed:
 - 1st iteration, each group to focus on education or research
 - 2nd iteration, each group to focus on education or research (where people mix in new groups, and potentially change topic)
 - 3rd final iteration: Synthesis – tasked to not only discuss but not to propose 1-2 concrete actions forward (given previous discussions) for education and/or research

Some guidance

- SE – how to consider in education? At what level? In what form(s)? Entire programs or specific (mandatory or electable) courses? Or integrate into existing courses?
- SE – how to consider in research and when appropriate? Research in SE or SE as a tool for research (e.g. using systems thinking); Stimulating multidisciplinary research