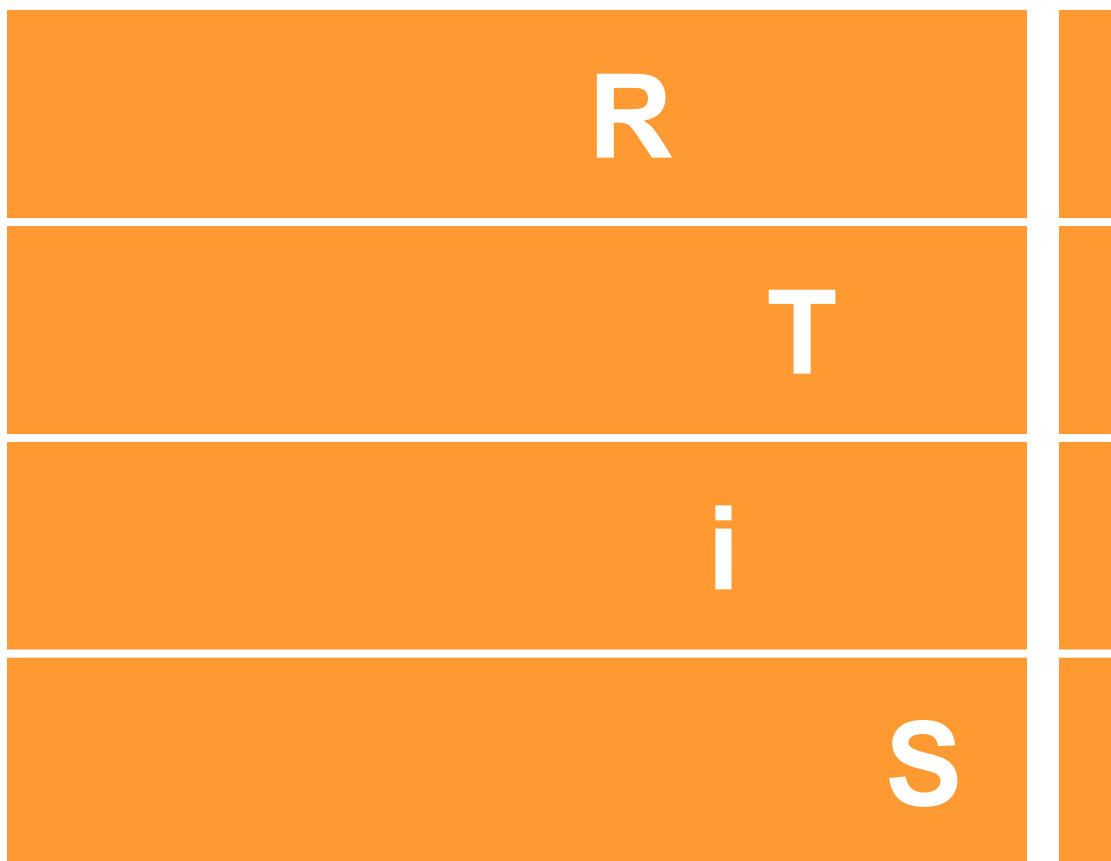


Real Time in Sweden 2003

Panel: *Embedded systems of strategic importance for Swedish society*



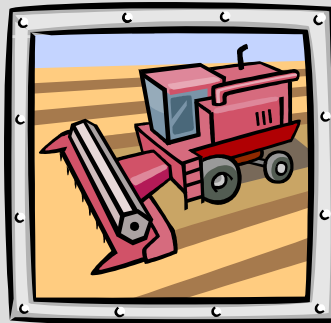
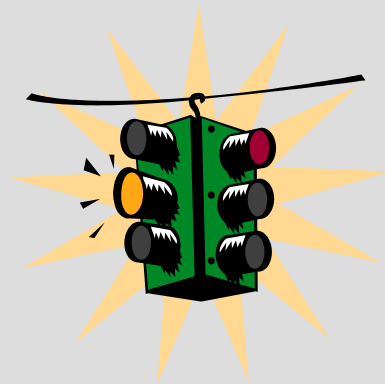
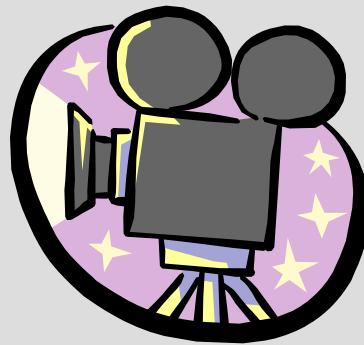
The Panel

Panelists

- Per Skytt – ABB Corporate Research, Head of Division of Automation Technology
- Karl-Einar Sjödin – Vinnova, The Swedish Agency for Innovation Systems
- Prof. Kang Shin – Michigan/US
- Prof. Heonshik Shin – Seoul/Korea

Moderated by Prof. Martin Törngren,
KTH, Snart chair

Embedded systems, of strategic importance for Swedish society?



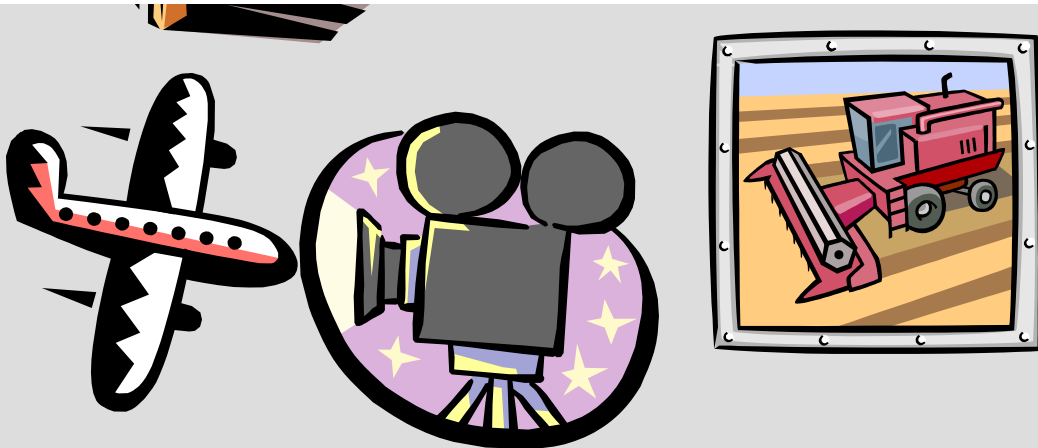
Embedded systems - some indicators

- 30% of manufacturing cost and 90% of innovation lies in software & electronics in automotive (BMW/Daimler)
- Swedish export – largest sectors:
 - 14,1% from automotive sector
 - 5,8% from telecom sector
- Other areas including hand-held devices, games, health-care, industrial control, etc.
- ES market size ~ 100 times size of desktop computers

Embedded systems, of strategic importance for Swedish society!

Embedded systems are of importance and there is a great potential!

But where are the needs and how should efforts be directed?



Panel questions and approach

- Needs as seen by different stakeholders
(industry, society, academia)
- Why is the research situation difficult?
- Approach for the panel -
Swedish and international perspective

What are the needs?

- Complexity and immaturity of ES?
- Specific technology/types of systems?
- Humans and embedded systems?
- Specific needs of industrial sectors?
- Systems engineering?
- Bridge gap from theory to practice?
- New applications?
- Technical. vs organizational issues?
- Applied vs basic research?
- Lack of trained people?

Why is the research situation difficult? - indicators

- *Professors only do 8% of the total amount of research ... spend too much time on looking for funding*
 - free translation from a statement in Swedish by the General Secretary of the Swedish Science Council
- *40% reduction of public research funding (including SSF, KK, etc.)*
 - survey in NyTeknik, 25 juni 2003

Why is the research situation difficult?

Funding:

- Reduction
- Short-term
- Fragmentation

Academia:

- Isolated communities
- Reduced free research

Gap from research to practice

Reduced interest from young people

Panel approach

- Viewpoints on needs and problems
- Suggestions on how to promote a “successful” research climate to improve the current situation?
- Opportunities?
- Swedish and international perspectives

Some suggestions

What can we learn from other continents?

Coordinated research
(industry/academia/funding)?

Improved funding and evaluation schemes?

Stronger research centers? – Focused vs. broad efforts?

Multidisciplinary research?

Closer connections between industry and academia (research and education)?