

Master Program Computer Science and Engineering

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MF 6.071b



TU / **e** Technische Universiteit
Eindhoven
University of Technology

Where innovation starts

Goals and vision

- Graduate has developed
 - *scientific engineering* attitude towards computer science with emphasis on design, construction, and validation of computing systems
- CSE provides
 - sound theoretical foundations
 - methodical application in design & analysis
 - contact with research and industry
- CSE prepares for
 - **jobs:** sw developer/engineer (31%), consultant (7%), ...
 - **training:** researcher (PhD: 13%), designer (PDEng: 4%)

Computer Science and Engineering

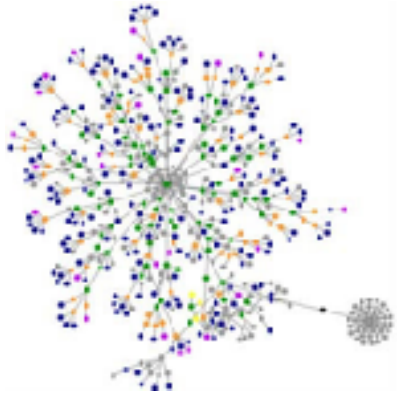
- Sound theoretical foundations
- Methodological design and analysis
- Contact with research and industry
- stream mandatory + stream electives + seminar + graduation project
- Three streams
 - Software, Web, and Systems

Three Streams - Illustrative courses



Software Science

Generic language theory
Software evolution

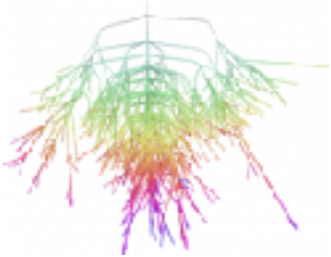


Web Science

Web information retrieval
Visualisation

System Science

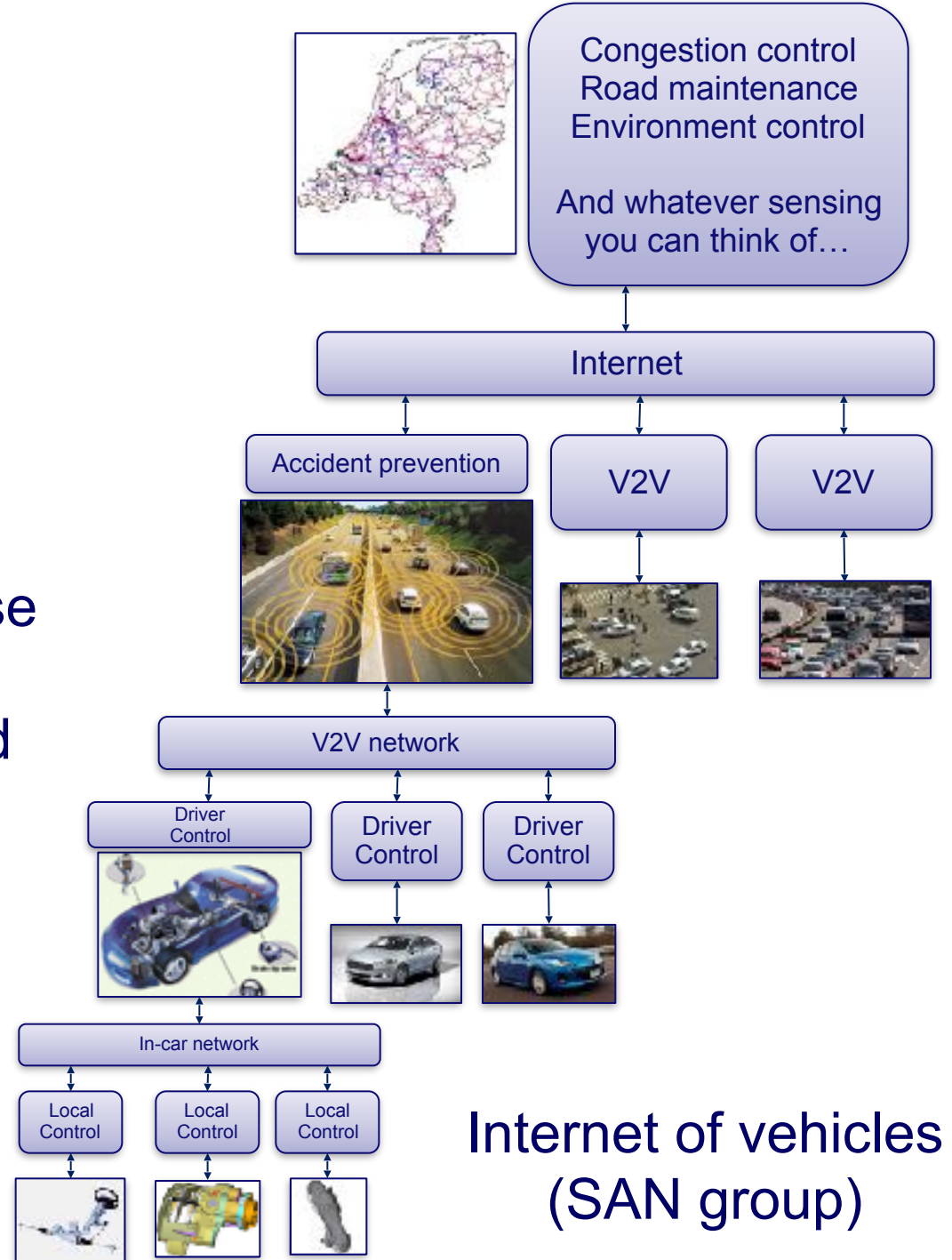
Real-time systems
System validation



As an example: System Science

General issues:

- large software code base
- systems-of-systems
- high assurance required



Electives, Capita Selecta, and Internships

We offer >50 electives and

any course taught on a master level at **any** university in **any** country may be suitable, if approved **in advance**

Capita Selecta: research assignment by invitation **only**.

Internships (abroad).



The screenshot shows the NTRS (NASA Technical Reports Server) interface. At the top, there is a navigation bar with links for BASIC SEARCH, ADVANCED SEARCH, ABOUT NTRS, OAI HARVEST, and SEARCH TIPS. Below this is a search bar with the text "Start a New Search: Enter search terms..." and a "Search" button. The main content area displays "Record Details" for a specific document. The document title is "Challenges in the Verification of Reinforcement Learning Algorithms". Below the title, there is a link to view the full-text PDF (341 KB). The author and affiliation information is listed as "Van Woud, Perry (Eindhoven Univ. of Technology, Eindhoven, Netherlands); Goodale, Alwyn E. (NASA Langley Research Center, Hampton, VA, United States)". The abstract begins with "Machine learning (ML) is increasingly being applied to a wide array of domains from search engines to self-driving vehicles. These algorithms, however, are notoriously complex and hard to verify. This work looks at the underlying machine learning algorithms as well as some of the challenges in trying to verify ML algorithms. The focus is on the specific challenges of verifying reinforcement learning algorithms. These are highlighted..."

Thesis project

- **Crucial: duration!**
 - 6 months
 - Supervisor can grant an extension up to 3 months
 - Examination committee can grant another extension up to 3 months
 - After 12 months: *finita*
- **Find yourself**
 - favorite specialisation
 - supervisor (can also help with selecting electives)

QUESTIONS ?