Presentation Master SNE

System and Network Engineering

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History and philosophy

Organisation

SNE Lab

Courses

People involved and more information

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Outline

History of SNE

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- Master of Science education, started in 2003
- Originally called System and Network Administration
  - In Dutch: "Systeem- en NetwerkBeheer"
- Now called System and Network Engineering
  - In Dutch: "Systeem- en NetwerkEngineering"

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Inflow

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- Bachelors of Science in Computer Science ("WO")
  - Unconditional access with a voluntary assessment
- Bachelors of (Technical) Informatics (Polytechnic ("HBO"))
  - Conditional access after required intake procedure (assessment)
  - Belonging to the best polytechnic students
  - Very well motivated

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- SNE master with an academic view

    - Abstraction power

    - Scientific knowledge

    - Innovation power

    - Presentation skills

    - Reporting skills

    - Research skills

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Focus

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- Open Technology
    - Open standards
    - Open software
    - Open security

- Security is omnipresent

- Technical orientation

- Middle ground between abstract science
  and professional application

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Accreditation

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Official accreditation by the NVAO

In november 2008 the master education SNE has been accredited by the NVAO ("Accreditation Organisation of the Netherlands and Flanders").

Most notable fact was that SNE got an excellent evaluation for our didactic concept.

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Accreditation links

- http://www.nvao.net/download/accreditatie/id_2577_besluit%20UvA%20wo-ma%20System%20and%20Network%20Engineering.pdf

- http://www.nvao.net/download/accreditatie/id_2577_rapport%20UvA%20wo-ma%20System%20and%20Network%20Engineering.pdf

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Outline

Curriculum

- Total of 10 modules of 6 ECTS each
    - 60 ECTS == 1 year
    - 2 weeks == 3 ECTS

- Semester 1: 8+8+4 weeks

- Semester 2: 8+8+4 weeks

- Full-time or part-time ($\equiv$ full-time in 2 years)

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Semester 1

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Period	Part-time year 1	Part-time year 2
September-October	ESA	CIA
November-December	SSN	DIA
January	RP1	

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Semester 2

Period	Part-time year 1	Part-time year 2
February-March	INR	LIA
April-May	IDS	ICP
June	RP2	

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"Theoretical" courses

- 6 weeks (16 hours a week)
  - 2 * 2 hours lectures
  - 2 * 3 hours lab exercises and practical work
  - 1 * 6 hours private study
- 1 week casus
- 1 week tentamination

"Project" or "Practical" courses

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- Same as theoretical courses, but with a small project as part of the practical work
  - Teamwork
  - Communication
  - Presentation

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Research Project

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- ▶ 4 weeks (fulltime)

- ▶ Individual work (mostly)

  - ▶ Week 1: orientation and project definition

  - ▶ Week 2 and 3: research

  - ▶ Week 4: report writing

  - ▶ One day in week 5: presentation

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The "fifth" day

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- ▶ Lectures and lab exercises fill 4 full days every week

- ▶ The remaining day (mostly wednesday) contains

  - ▶ Guest lectures

  - ▶ Colloquia

  - ▶ Site visits

  - ▶ Research preparation

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Outline

SNE Lab production

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- ▶ Production environment
  - ▶ Old iMacs, to be replaced by modern x86 based PC's
  - ▶ Running Ubuntu Linux at the desktop
  - ▶ Using our own servers
  - ▶ Using our own IP space 145.100.96.0/20

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- Experimental environment
  - Unix (Linux, BSD, Mac OS X), Windows, . . .
  - Hardware routers and software routers
  - Each student uses own backend server
    with virtualisation technology

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New Lab (in preparation, opening August 2009)

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- Essential Skills for Administrators
    - Basic skills and techniques
        - Structured documentation in LaTeX
        - Structured web presence (XML, XHTML, XSLT, CSS)
        - Compilers, linkers and auto configuration
        - Scripting (bash, perl, python, ruby)

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- ► Classical Internet Applications
    - ► History
    - ► Booting
    - ► Email
    - ► Web
    - ► Directories

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SSN

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- ▶ Security of Systems and Networks
    - ▶ Crypto (traditional and modern)
    - ▶ Protocols (SSL, IPsec)
    - ▶ Authentication
    - ▶ Hacking tools
    - ▶ Passwords

- ▶ Mini-project included

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- Distributed Internet Applications
    - Communication
    - Naming
    - Synchronization
    - Consistency and Replication
    - Fault Tolerance
    - Security
- Cooperation with the VU

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- InterNetworking and Routing
    - Fysical and logical structure of the Internet
    - Addressing (IPv4, IPv6)
    - Layer 2 and spanning tree
    - Layer 3 and routing
        - Interior (RIP, OSPF, IS-IS)
        - Exterior (BGP)

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LIA

- Large Installation Administration
  - Data centers
  - Disaster Recovery and Data Integrity
  - Scalability
  - Change Management
  - Ethics

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- ▶ Intrusion Detection Systems
    - ▶ Basics of TCP
    - ▶ Sniffing the network
    - ▶ Intrusion detection
    - ▶ Malware
    - ▶ Forensics
- ▶ Mini-project included

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- ICT and Company Practice
  - Management Policies
  - Enterprise Architecture
  - Sourcing Governance
  - Innovation Management

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Research Projects

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- Research a problem of your own choice

- Examples

  - OV Chipcard

  - Detection of peer-to-peer botnets

  - Smart metering

  - Wireless protocol analysis using GNUradio

  - Open Recursive Nameservers

  - Scale-free Optical Networks

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E-passport investigation (The Times)

The slide shows a photograph of a newspaper article from The Times.

News

Fatal flaw: How a baby became

The supposedly fail-safe system devised to foil terrorists and criminals can be easily turned to their advantage, **Steve Boggan** reports

Jeroen van Beek takes the passport of a 16-month-old British boy and puts it on to a £40 smartcard reader the size of an iPod. He punches a code into his computer and, within seconds, the information contained in the passport's microchip appears on screen.

This is not supposed to happen, as communication between the chip and the reader uses powerful encryption, but a renowned British computer expert called Adam Laurie worked out how to crack the code 18 months ago.

Within seconds, in his university office in Amsterdam, Mr van Beek, 30, copies the contents of the microchip on to another chip, making a clone of the first. He launches some software called Golden Reader Tool — the International Civil Aviation Organisation (ICAO) standard kit for checking biometric passports — and the new chip is flagged up as authentic.

As amazing as this may seem, this is nothing new. A German computer academic called Lukas Grunwald first cloned chips from his country's pass-

Outline

Lecturers involved

- The Core Team
    - Director of education Karst Koymans
    - Master coordinator Jaap van Ginkel
    - Lab teacher Eelco Schatborn
    - Lab manager Jan-Philip (JP) Velders
- Other lecturers
- Guest lecturers

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A happy group of students (2007-2008)

SNE website

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- ▶ https://www.os3.nl/

- ▶ mailto:info@os3.nl

- ▶ "goto: Leeuwenburg, Weesperzijde 190, Amsterdam"

  for a visit and a personal introduction

- ▶ This presentation can be found on

  https://www.os3.nl/info/start

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