Cyberinfrastucture Challenges in the Roaring Twenties

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Thursday January 30, 2025

How retirement looks like ☺

- Kings and Bishops, then and now!
- The Digital World is slowly becoming a dangerous place.
- The digital transformation of Data Intensive Science is in full swing.
- Cyber Infrastructure is essential for Industry, Science and Society
  - Guiding the UvA through the Digital Transformation
    - 20M for Data Science Center
    - New digital mission for the Library
    - Working closely with CISO and Rector on Secure and Sovereign CI
    - Chair of the IT for Research and member of related UvA Committee's
  - Deep conversations with leadership at NSF and DoE
  - Chair of CZ cyber infrastructure Scientific Advisory Board.

Activities with CIENA

- Work with CIENA to create a “learning by doing” track in OFC.
  - advise on a “Building Networks out of Components (BNC)” track in the technical program to get academia involved.
  - What can be reused from INDIS
- Work with CIENA at SC to demonstrate safe data infrastructures
  - Include the efforts in AMDEX.
- Work with CIENA on the application of relevant testbeds
  - persistent innovation engines for the research
  - relevant testbeds here are FABRIC, BRIDGES, SLICES-RI and 2Stick
  - upgrade CIENA testbed to Amsterdam

Current INDIS & DoE & NSF activities

- Contribution in team INDIS
  - Last year look at Integrated Research Infrastructure
  - This year HPDF large part of the theme
  - Testbeds integration with SCinet
- Continue engagement with FABRIC, get NRP involved
- Engage NSF, DoE on CI & AI and data strategy, relate to IRI
- See what HPDF is doing and gets in the picture (Library of Congress)
- Data / library vision & challenges - collecting vs collector
- Persistent vs working storage, incidental vs structural funding

Challenges ahead

- Knowledge safety (“kennisveiligheid”)
- Security – the attacks on our CI
- Cyber Infrastructure is not resilient wrt geopolitical changes
- The transformation of Science in the digital age
- The (in)dependence on big tech, plan a-b, exit strategies, etc.
- Sovereignty: Be yourself in a digital world!

This morning 5h00

session 3h45 – 5h15

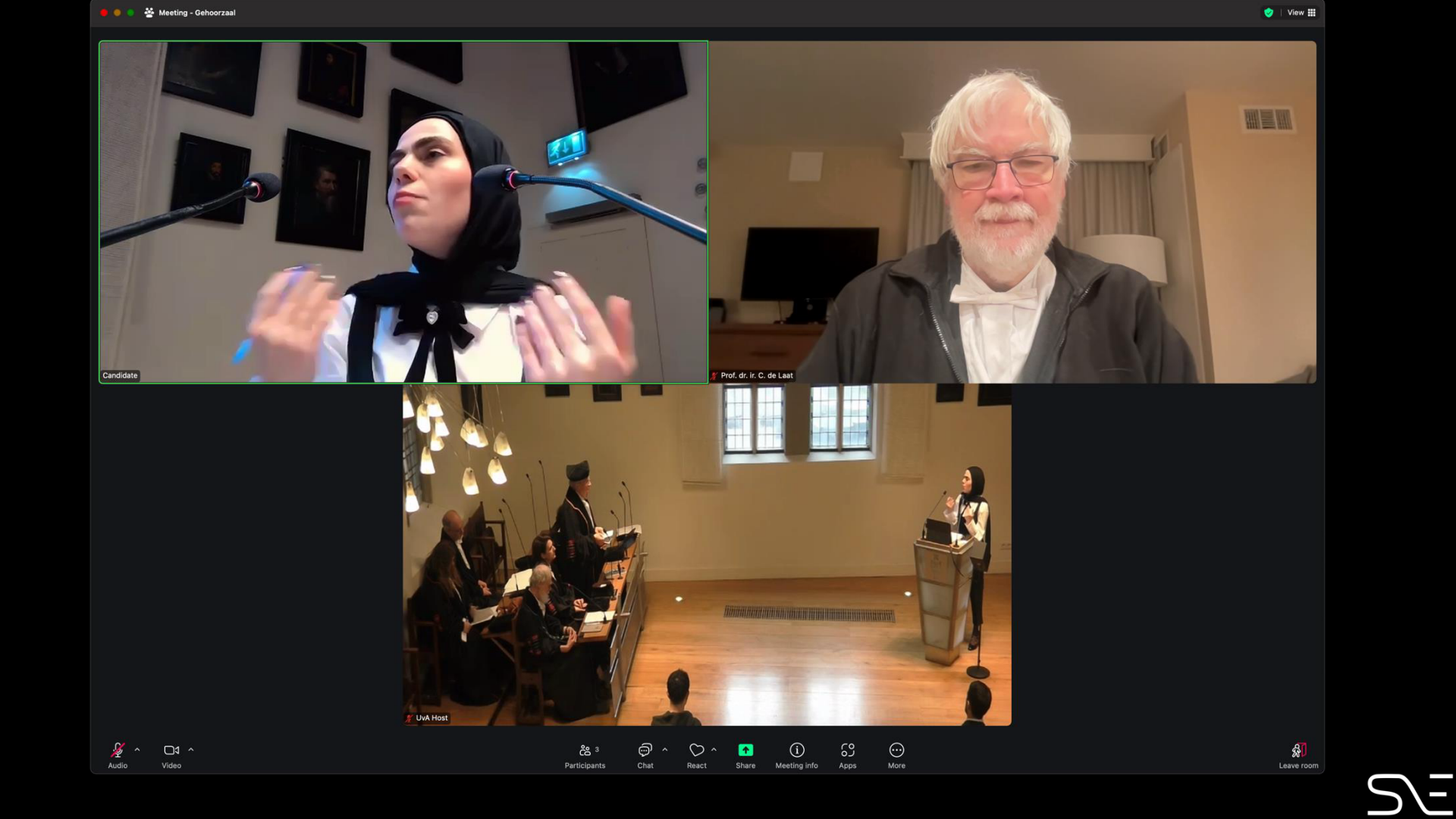
30 PhD's

counting from 0

1988 :-)

Phd students after retirement

- dr. Jamila Alsayed Kassem, "Programmable Infrastructures for Secure Healthcare"
- dr. Aya Fukami, "Effective Mobile Forensics Through Exploiting the Memory Security"
- dr. Sara Shakeri, "SecConNet - Smart and Secure Container Networks for Trusted Big Data Sharing"
- dr. Michael Mesarcik, "Machine learning-based anomaly detection for radio telescopes"
- dr. Xin Zhou, "From Empowering to Motivating; Enhancing Policy Enforcement through Process Design and Incentive Implementation"
- dr. Ruyue Xin, "Towards Effective Performance Diagnosis for Distributed Applications"
- dr. Zeshun Shi, "Enhancing Service-Level Agreements Using Decentralized Auctions and Witnesses"
- dr. Lu Zhang, “A policy compliance detection architecture for data exchange infrastructures”
- dr. Merijn Verstraaten, “Analysis and Predidion of GPU Graph Algorithm Performance“
- dr. Dolly Sapra, “Efficient Neural Architectures for Edge Devices”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Conclusions, Info, Acknowledgements, Q&A

- Data hindered by risk of unexpected use, lack of trust
- Using market principles, enforcement and determining incentives and value in the data life cycle to make data flow
- More information & published papers:
  - http://delaat.net/dl4ld http://delaat.net/epi http://delaat.net/sc
  - https://www.esciencecenter.nl/project/secconnet
  - https://towardsamdex.org https://upin-project.nl/
  - Slides with help from: Reggie Cushing, Sara Shakeri, Lu Zhang, Leon Gommans, Xin Zhou, Thomas van Binsbergen and many others.

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