2023 CompSys Meetup of
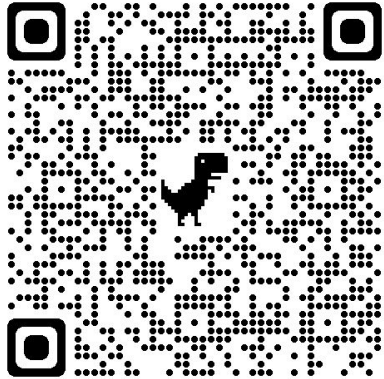# IPN SIG on Future Computer Systems and Networking

Animesh Trivedi (on behalf of the SIG FCSN Team)

Future Computer Systems and Networking (FCSN)

https://ict-research.nl/groups/special-interest-groups/fcsn/
https://tinyurl.com/2023-compsys-fcsn

Key Message

Progress with many things, but without your help

- we cannot <u>grow</u> as a large cohesive community (e.g. AI-community)

- we cannot <u>attract</u> and absorb more funds and people

- we cannot <u>plan</u> for ambitious research goals and activities

Good for everyone, not just one side or group of people!

This is the Computer Systems and Networking Golden Age!

ECONOMY AND SOCIETY ARE BUILT ON DIGITAL

€460 MLD — DIGITAL VALUE

3,3 MLN — JOBS CREATED

56% JOB GROWTH 2019-2024

Diverse, Digital Services for ALL

Impacting >60% of
the NL GDP (1 trillion EUR/y)

Every €1 → €15 Added Value

Attracting >20% of
all foreign direct investments in NL

Sources: Dutch Data Center Association, 2020 [Online] Growth: NL
Gov't, Flexera, Binx 2020. Gartner 2019. IA 2017.

3

A (self-selected biased) Long List of Past and Present Innovations

- CD, Bluetooth, Wi-Fi, DVDs, Blue-ray

- Foundations of computing (Dijkstra)

- THE multiprogramming system, MINIX, Amoeba

- Amsterdam Compiler Kit

- Python, Vim

- Internet connectivity in the Europe

- Amsterdam Internet Exchange, ASML, Philips

Back to the Future

SIG - Future Computer Systems and Networking (FCSN)

Future Computer Systems and Networking Research in the Netherlands: A Manifesto
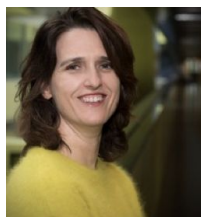
bit.ly/ManifestoCompSysNL

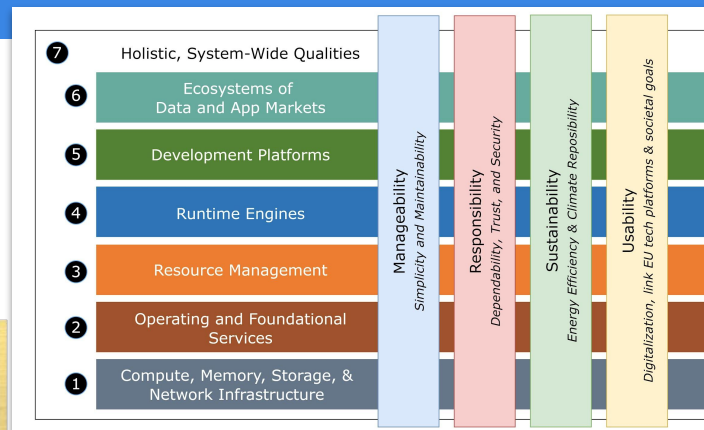dr. ir. Animesh Trivedi

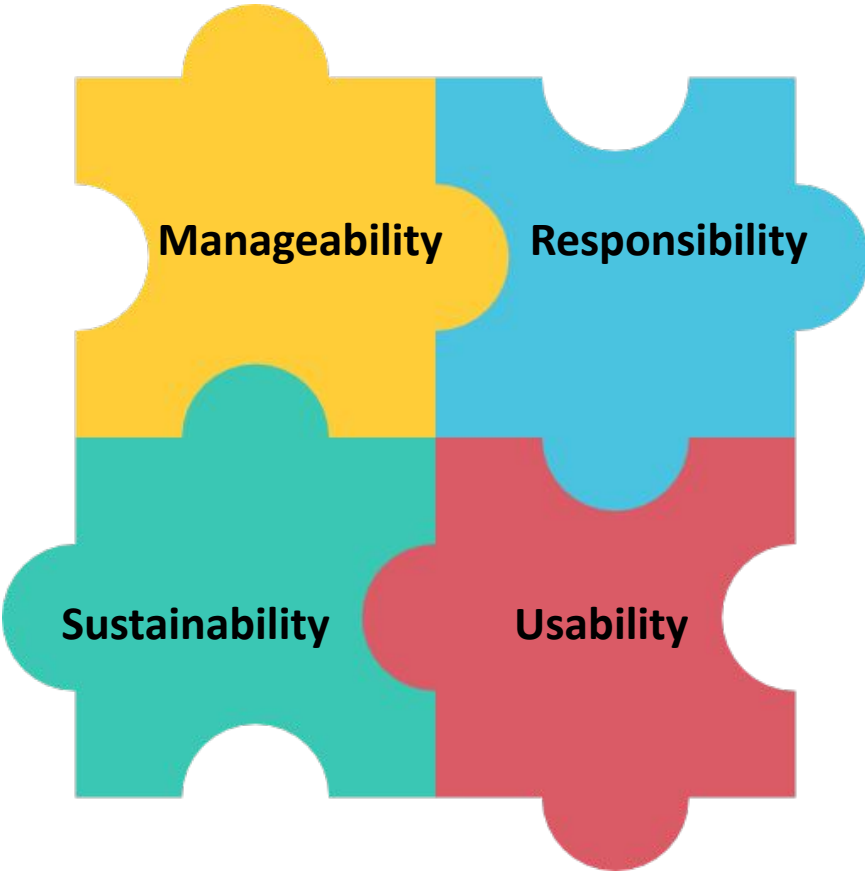Prof.dr.ir. Fernando Kuipers

dr. Paola Grosso

dr.ir. Ana Lucia Varbanescu

Prof.dr.ir. Alexandru Iosup

Four Grand (Verticals) Cross-disciplinary Societal Challenges

Manageability
- Complexity management, abstractions, human-in-the-loop, digital ecosystems

Responsibility
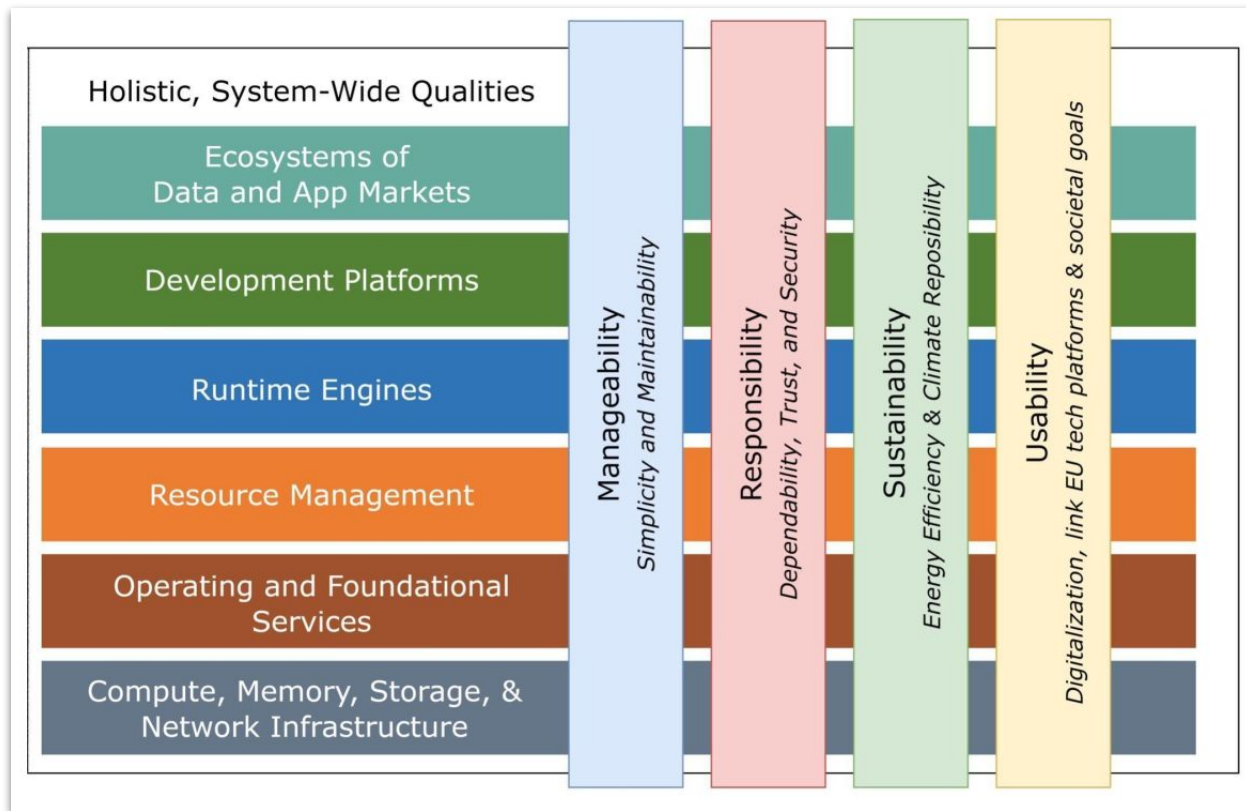- Privacy, ethical, security, performance, availability, and durability

Sustainability
- Energy footprint, sustainable computing

Usability
- Healthcare, sciences, governance, society

(Horizontals) Foundational Research Themes
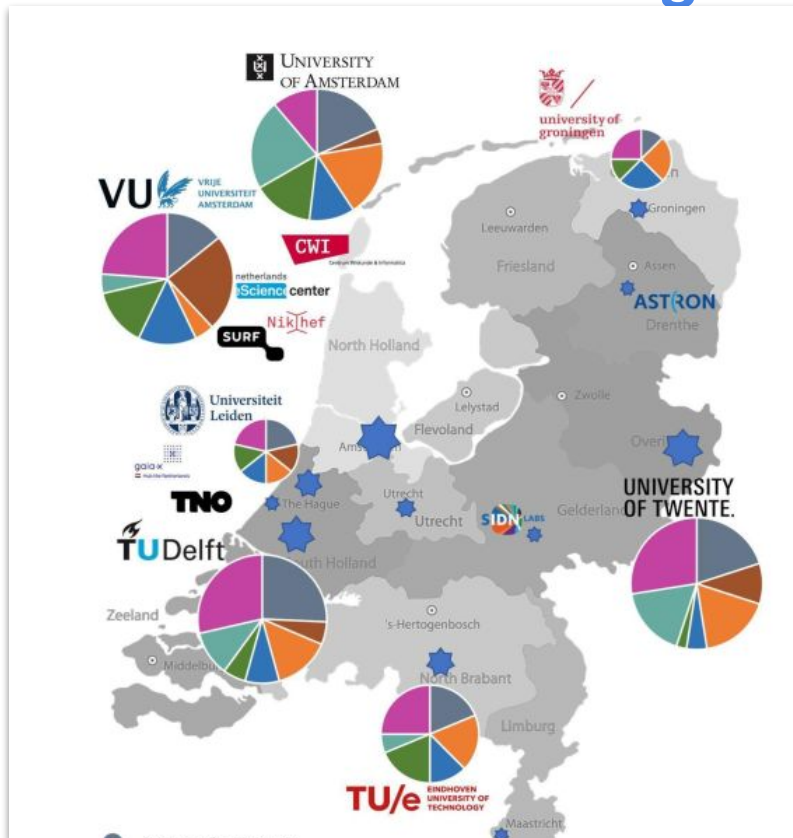
Interactive moment …

How to participate?

1 Go to **wooclap.com**

2 Enter the event code in the top banner

Event code
LQABQX

1 Send **@LQABQX** to **0970 1420 2908**

2 You can participate

Copy participation link

Computer Systems and Networking Research Landscape

Topic 1 Infrastructure
Topic 2 Operating and Foundational Services
Topic 3 Resource Management
Topic 4 Runtime Engines
Topic 5 Development Platforms
Topic 6 Ecosystems
Topic 7 Holistic, System- wide Qualities

https://www.compsys.science/people/

10 Recommendations from the CompSys-NL Manifesto

1. Invest in personnel for holistic CompSys research.

2. Establish and maintain a coalition for CompSys.

3. Invest in CompSys infrastructure for research, demonstrations, proof-of-concepts, and pilots.

4. Recognize and fund cross-disciplinary translational CompSys research and open ICT science.

5. Harmonize the national curriculum on CompSys topics, to the extent possible.

6. Extend CompSys education and training to all levels of our society. Be inclusive.

7. Link investment in research to hiring from under-represented groups, to foster diversity.

8. Ensure alignment with and integration into EU technology platforms and societal goals.

9. **Introduce an ICT plan in NWO proposals that rely for their success on ICT infrastructure.**

10. Align strategic investments in computing in the Netherlands.

Primary Activities since the Inception ...

✓ Writing the Manifesto, publication, and reaching out to the community members

✓ Formation of the IPN SIG FCSN, becoming part of the structured discussion

✓ Sectorplan 2022 → 12-15 new positions funded in the NL (education)

✓ Groeifondsprogramma Future Network Systems (FNS) 6G

✓ DAS-7, SLICES-NL (next generation research infrastructure)

✓ [Structured approach for dissemination]

- (FAIR data sets and software) Grid Workloads Archive, Failure Trace Archive, Workflow Trace Archive, Cloud Uptime Archive (upcoming)

FNS PROGRAM OVERVIEW

PL1 Intelligent components
Highly efficient transmitters 1.1
JCAS 1.2
OTA testing 1.3
Optical-enabled wireless 1.4

PL2 Intelligent networks
Architecture design 2.1
6G DevOps & digital twin 2.2
AI network automation 2.3

6G Functionality
Sensing
Bandwidth & latency
Energy efficiency
Trustworthiness
Users per km^2
Programmability

PL3 Leading applications
3.1 Transport hubs
3.2 Remote surgery
3.3 Smart grids
3.4 Wireless detection
3.5 Wireless factory
3.6 E-commerce platform
3.7 Digital sport

PL4 Strengthen ecosystem
4.1 National 6G testbed
4.2 Standardisation
4.3 Supporting start-ups, SME
4.4 Human capital agenda
4.5 Policies and regulations

If you can …

Please share your CompSys success stories:
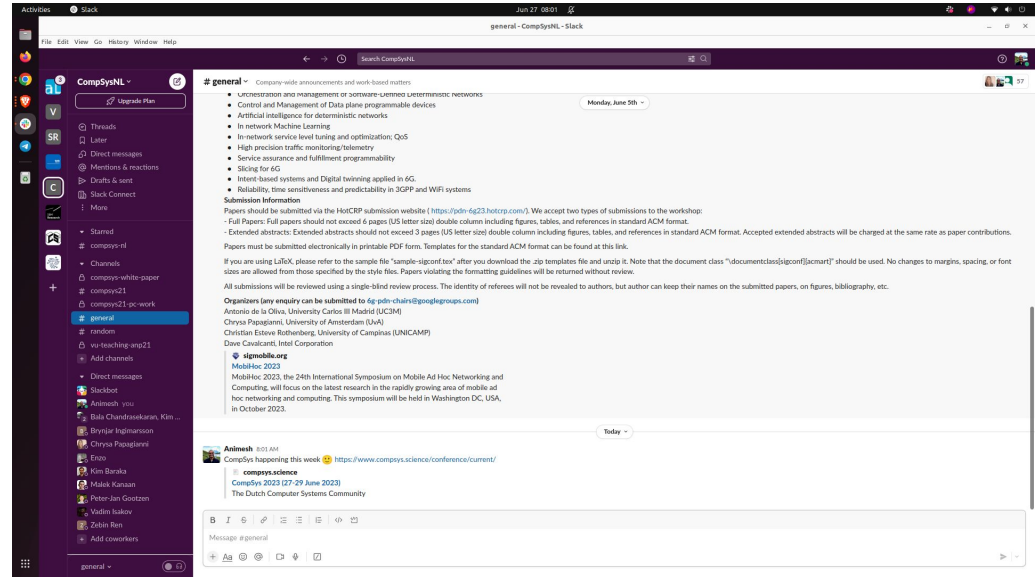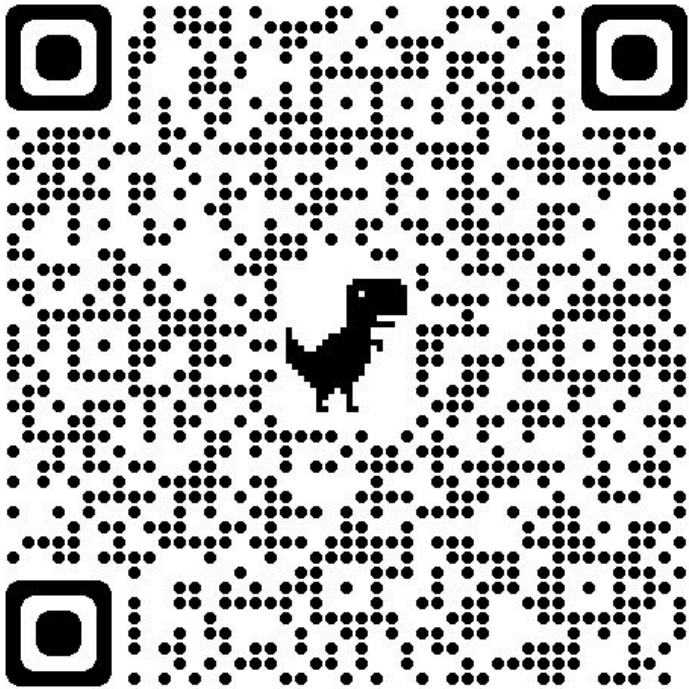grants, significant papers, collaboration, educational…

- Find me around
- Send an email: a.trivedi@vu.nl

We will summarize all the updates and send out our first newsletter in next couple of weeks

- [make it a habit after each CompSys]

Also, there is Slack

https://compsys-nl.slack.com/

Joining link:
https://join.slack.com/t/compsys-nl/shared_invite/zt-fx78q58g-Veea9LReM5zA1QqRPQ6peA