
WASP
WALLENBERG AI,
AUTONOMOUS SYSTEMS
AND SOFTWARE PROGRAM

CHALMERS

KTH VETENSKAP OCH KONST

LINKÖPINGS UNIVERSITET

LUNDS UNIVERSITET

UMEÅ UNIVERSITET

AFFILIATED GROUPS OF EXCELLENCE at

ÖREBRO UNIVERSITET

UPPSALA UNIVERSITET

LULEÅ TEKNISKA UNIVERSITET

Vision

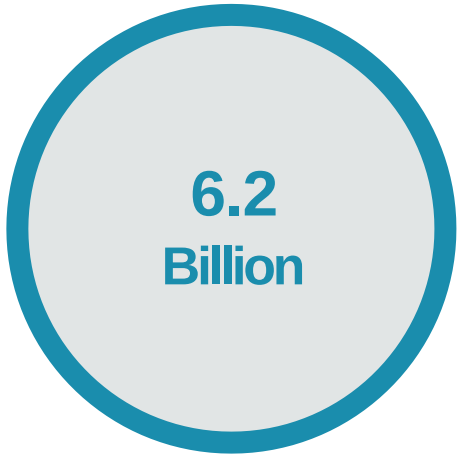
Excellent research and competence in artificial intelligence, autonomous systems and software for the benefit of Swedish industry.

Mission

Build a world leading platform for academic research that interacts with leading companies in Sweden to develop knowledge and competence for the future.

Knut och Alice Wallenbergs Stiftelse

WASP in Numbers



6.2 billion SEK for 15 years until 2031

600 Graduated PhDs

80 Faculty Recruitments

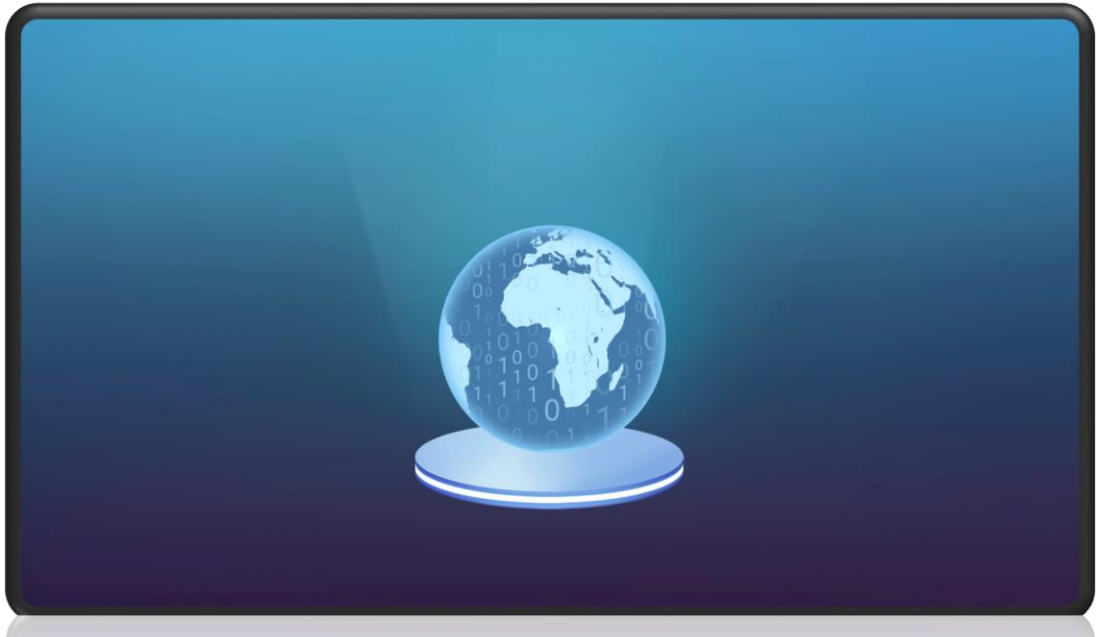
WASP – Providing Enabling Technologies

New technologies and methodologies are needed to address key societal challenges in:

- Transport and transport systems
- Energy production and distribution
- Manufacturing and production
- Healthcare and medical discovery
- Finance and societal governance
- IT infrastructure and communication
- ….

WASP is contributing by paving the way for Sweden in:

- Artificial intelligence
  - Machine Learning
  - Mathematical Foundation
- Autonomous Systems
- Software



WASP is playing a fundamental role in the sustainability transformation of the planet

2023 WASP Top Research Challenges

Research Challenges AS:

- Optimal combination of data-driven and model-based approaches
- Resource-efficient distributed modeling and execution
- Collaborative heterogeneous agents/robots in mixed domains
- Scalability

Research Challenges Software:

- Adaptive systems aware of humans and their preferences
- Monitoring systems that ensure safety and security
- Automated verification of (AI-intensive) software systems
- Reducing environmental impact of AI/ML systems development & deployment

Research Challenges AI/MLX

- Models that are explainable
- Relevant and tractable sampling from learned representations
- Learning from multimodal data
- Learning representations over short and long-time horizons

Research Challenges AI/Math:

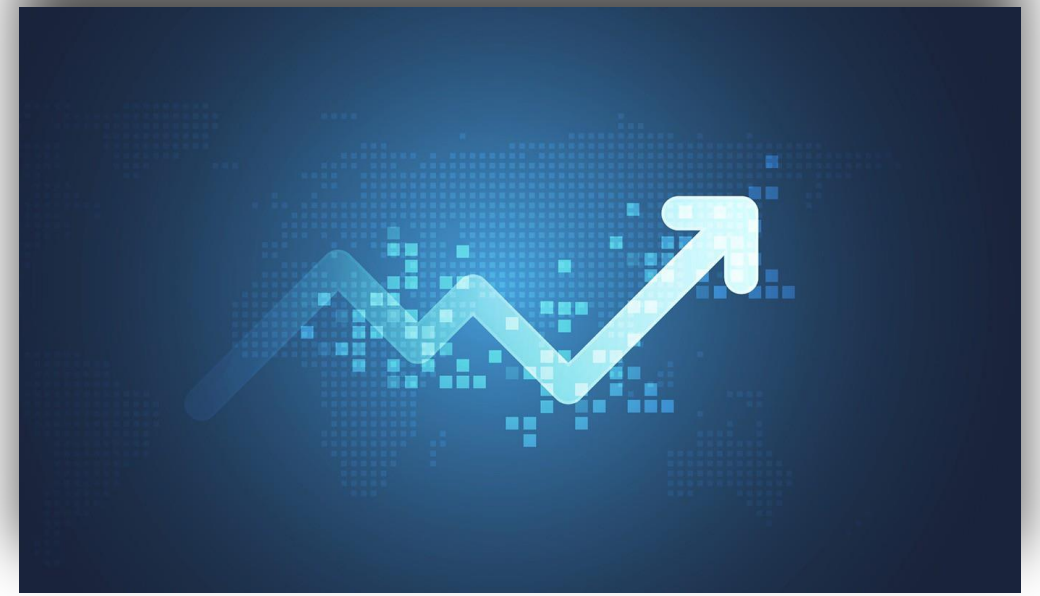
- Mathematics for provably efficient optimization in AI and Machine Learning
- Mathematics for explaining what NN-s do and their sensitivity to input noise
- Geometry for identifying and analysing complex data structures

WASP Instruments

- Research program
- Graduate school
- Recruitment
- Research arenas
- Internationalization
- Communication events networking

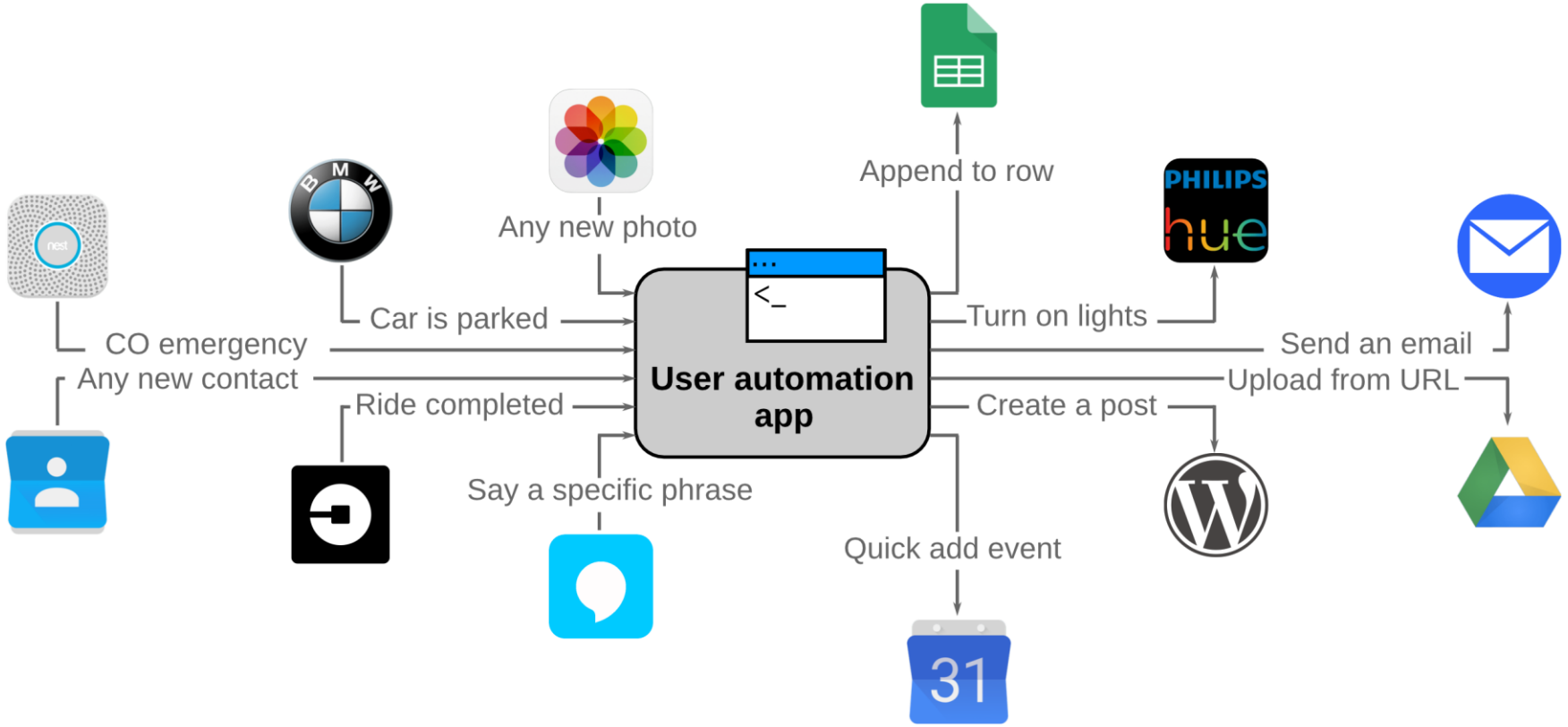
WASP Status 2023

- Recruitment of **13** professors in autonomous systems and software.
- Top-level recruitment of Wallenberg Chairs, now **9** in total (**4** guest professors)
- Recruitment of assistant/associate professors in AI, now **34** in total
- Growth of Graduate School, now with **409** active PhDs students, 100 industrial PhD students (72 have defended).
- **41** active postdocs
- **9** NESTs initiated
- **80** companies and agencies engaged in WASP
- New arenas in Robotics, Software and Media and NLP



WASP NEST CyberSecIT:
Automated & Autonomous Cybersecurity for IoT

The world of IoT is fascinating but who is in charge?
Objective: security and privacy in IoT platforms



Key challenges:
Automation – software!
Autonomy – AI!

CyberSecIT

- Decentralized IoT app platform
- Design principles for secure and usable permissions for IoT
- Secure data aggregation
- CyberSecIT dashboard

Andrei Sabelfeld

Software

Web

HCI

Applied crypto

Privacy

Simone Fischer-Hübner

Vicenç Torra

Databases

Big data

Differential privacy

AI

Programming languages

Formal methods

Musard Balliu

ERICSSON

ICA GRUPPEN

Stockholms stad

Cyber Security Initiative

- 180 MSEK until 2031
- Identification of strong researchers and research groups
  - Bibliometric analysis (Program Office)
  - University survey (URG)
- Current plans
  - Recruitments
  - Arena
  - Large scale projects