Welcome!

Please take a seat – the event starts at 12:30

WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

10 YEARS

Amy Loutfi

WASP Program Director

WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

10 YEARS

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WASP Program Overview

2025 - January

WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

LINKÖPING UNIVERSITY

CHALMERS UNIVERSITY OF TECHNOLOGY

LUND UNIVERSITY

KTH VETENSKAP OCH KONST

UMEÅ UNIVERSITY

AFFILIATED GROUPS OF EXCELLENCE AT

ÖREBRO UNIVERSITY

UPPSALA UNIVERSITET

LULEÅ TEKNISKA UNIVERSITET

Knut and Alice Wallenberg Foundation

Vision

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

Mission

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

WASP in Numbers

6.5 billion SEK for
15 years until 2031

Goal to graduate
600 PhDs

Goal to recruit 80
WASP Fellows

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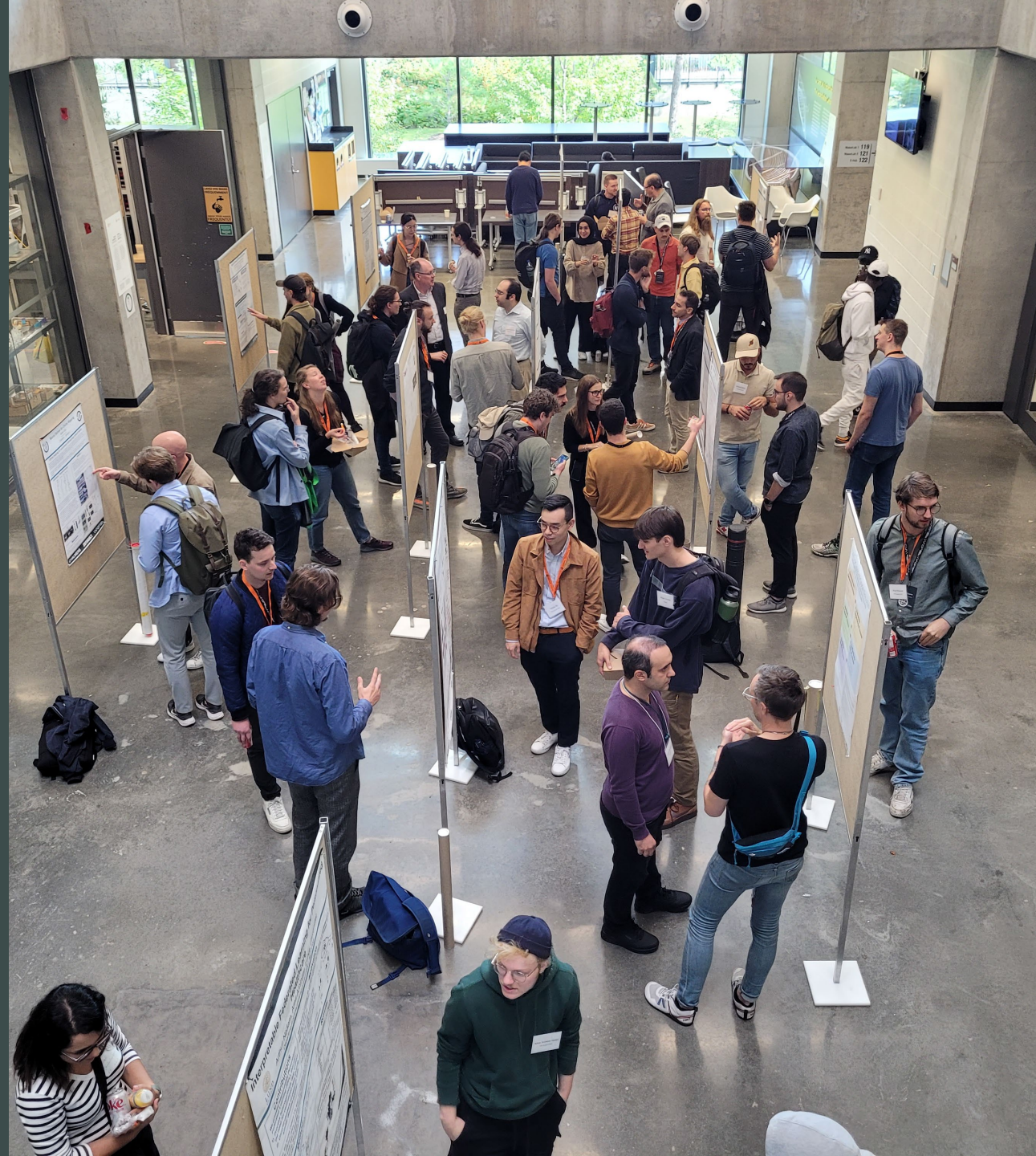
WASP Instruments

- Recruitments
- Research arenas
- Communication, events, networking
- Research program
- Internationalization
- Graduate school



2024 WASP Top Research Challenges

- Complex data and models in AI
- Human in the loop and explainability
- Scaling and distribution of resources
- Efficiency, verifiability, security and robustness

WASP Status 2025

72 Recruitments

500 Active PhDs (**161 have** defended)

80 affiliated companies and agencies engaged

WASP Winter Conference 2024 with 550 participants

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Strategic Recruitements

WASP Recruitments

More than 72 new research groups from strategic recruitments, and more on the way.

Recruited Faculty so far

- AI:~13
- AI/Machine Learning: ~18
- AI/Math: ~16
- Autonomous Systems: ~19
- Cybersecurity: ~5

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Examples of recent recruitments

Dániel Varró
Professor
Linköping University

Filip Tronarp
Assistant Professor
Lund University

Hamed Nemati
Assistant Professor
KTH Royal Institute of Technology

Hazem Torfah
Assistant Professor
Chalmers University of Technology

Jan Gerken
Assistant Professor
Chalmers University of Technology

Johan Thunberg Assistant Professor
Lund University

Matthieu Barreau
Assistant Professor
KTH Royal Institute of Technology

Olov Andersson
Assistant Professor
KTH Royal Institute of Technology

Rocío Mercado
Assistant Professor
Chalmers University of Technology

Silun Zhang
Assistant Professor
KTH Royal Institute of Technology

Stefan Neumann
Assistant Professor
KTH Royal Institute of Technology

Stephanie Lowry
Assistant Professor
Örebro University

Zoe Falomir
Associate Professor
Umeå University

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How are the WASP assistant professors doing?

- At least 17 have become docent since arriving in Sweden
- At least 12 have received VR grants
- KTH Math BUL recruitments have excelled in promotion and external funding
- CTH BUL recruitments have extraordinary bibliometrics and have managed to obtain additional WASP funding (12 grants in total)

Katharina Jochemko, Assistant Professor (KTH)

Alumni of the year 2023: Rebekka Wohlrab

- Assistant professor in Software Engineering at Chalmers University of Technology in Gothenburg, Sweden. She is also an adjunct faculty at the Institute for Software Research at Carnegie Mellon University, where she was a postdoctoral researcher during 2020-2022.

- PhD in Computer Science and Engineering from Chalmers University of Technology and a BSc and MSc in Computer Science from Paderborn University, Germany.

- Her research is in the areas of self-adaptive systems, software architecture and requirements engineering.

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Diversity and inclusion

Diversity and Inclusion Group (DIG)

WASP works to promote multiple axes of diversity including but not limited to gender, culture, academia/industrial and more.

- Drives the work within WASP on Diversity and Inclusion
- Gender aspects considered in all calls
- Recruitments in ”Särskild ordning”
- 6 targeted positions for female assistant professors
- 5 more positions open

  - Chair: Amy Loutfi, ÖRU
  - Per Runesson, LU
  - Mary Sheeran, CTH
  - Alma Persson, LiU
  - Anoud Alshnakat, KTH
  - Mikael Johansson, KTH

Diversity and Inclusion

- Gender Balance in Graduate School is approx. 22% women.

- Two rounds to recruit female researchers have been executed
  - First round was to recruit AI/MLX BULs as there were no women among the ~15. Resulted in 5 recruitments.
  - Second round is ongoing with up to 5 positions at any level, in all WASP areas.

Other DIG activities

- DIG is proactive in all aspects of WASP
  - DIG exhibition at Winter Conference
  - DIG yearly fall workshop
  - DIG related content at various events
- DIG also supports student/staff driven events
  - Women in ML workshop arranged by PhD students
  - Promotion of courses e.g. Data Feminism course

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Interfaces to Industry and Society

WARA: The Mission

> Increase the value and relevance of research by strengthening and promoting collaboration between WASP researchers and industry partners.

Photo: Thor Balkhed, Linköping University

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WASP Research Arenas

Main objective

Increase the value and relevance of research and shorten knowledge transfer between academia and industry.

Focus

- Seek and leverage on industrial and institutional motivation and ownership.
- Integrate WARA in other WASP instruments: calls, projects, graduate school, etc.

Photo: Thor Balkhed, Linköping University

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WASP Research Arenas

WARA | OPERATIONAL DATA

Anomaly Detection & Secure Cloud

- Intrusion detection
- Denial-of-service attacks, etc

Autonomous Management

- Power reduction use metrics
- Power consumption data, etc

WARA | PUBLIC SAFETY

Collaborative systems for public safety that supports teams of humans and systems acting and interacting in a distributed context supporting human authority and benefitting from functions with various degree of autonomy.

WARA | ROBOTICS

- Reinforcement learning
- Automated reasoning
- Perception
- Human-Robot Interaction
- Assembly with Dual-arm Robots

WARA | MEDIA & LANGUAGE

- World-class research community for Media and Language AI
- Offer networking, infrastructure, and data
- Dedicated streams for Language and Gaming

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WARA Public Safety

Research focus

Collaborative systems for public safety that supports teams of humans and systems acting and interacting in a distributed context supporting human authority and benefitting from functions with various degree of autonomy.

Objective

Public safety and security research is of increasing interest and importance both nationally and internationally. WARA PS promotes research in collaborative heterogenous agents and systems of systems, acting in public safety related scenarios to keep society safe.

WARA | PUBLIC SAFETY

Photo: Peter Karlsson, Svarteld foto & form AB

WARA Robotics

Research focus

- Reinforcement learning
- Automated reasoning
- Perception
- Human-Robot Interaction
- Assembly with Dual-arm Robots

Objective

Autonomy and robotics are both multidisciplinary topics. The arena aims to be a community and resource to facilitate industry-relevant autonomous robotics research within WASP.

WARA | ROBOTICS

WARA Media and Language

Research focus

- World-class research community for Media and Language AI
- Offer networking, infra-structure, and data
- Dedicated streams for Language and Gaming

Objective

Mastering human communication by:

- Reuniting analysis and synthesis
- Fusing non-linguistic and linguistic information
- Capturing state and communication intent

WARA | MEDIA & LANGUAGE

WARA Operational Data

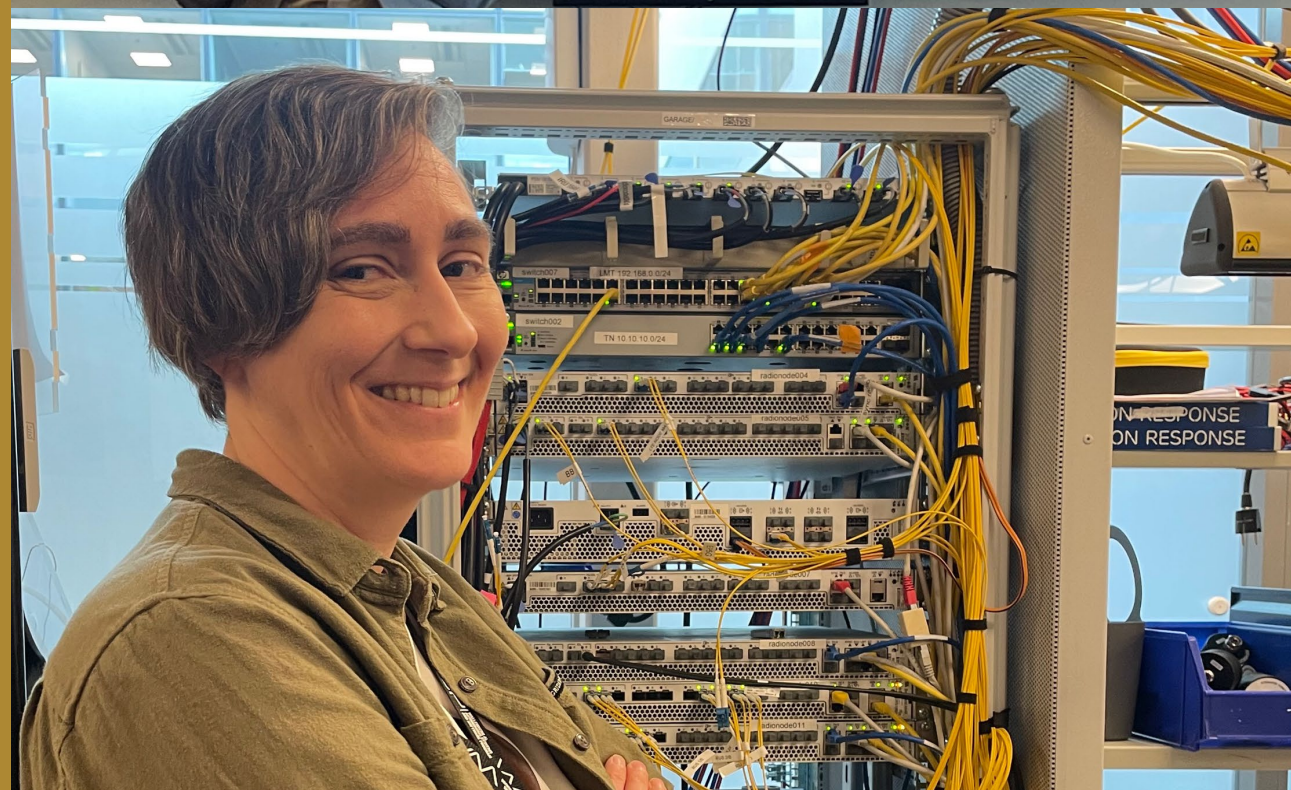
Research focus

- Anomaly Detection & Secure Cloud
- Intrusion detection
- Denial-of-service attacks, etc
- Autonomous Management
- Power reduction use metrics
- Power consumption data, etc

Objective

Bring together Swedish industry and academia to solve state-of-the-art challenges in data-driven operational research.

WARA | OPERATIONAL DATA



WARA – Research Arenas

- Currently in planning
  - Drug discovery, design, validation & production
  - Autonomous Land Transport Systems

- Annual WARA PhD Calls
  - **16** PhD project applications accepted 2023
  - **18** PhD project applications accepted 2024

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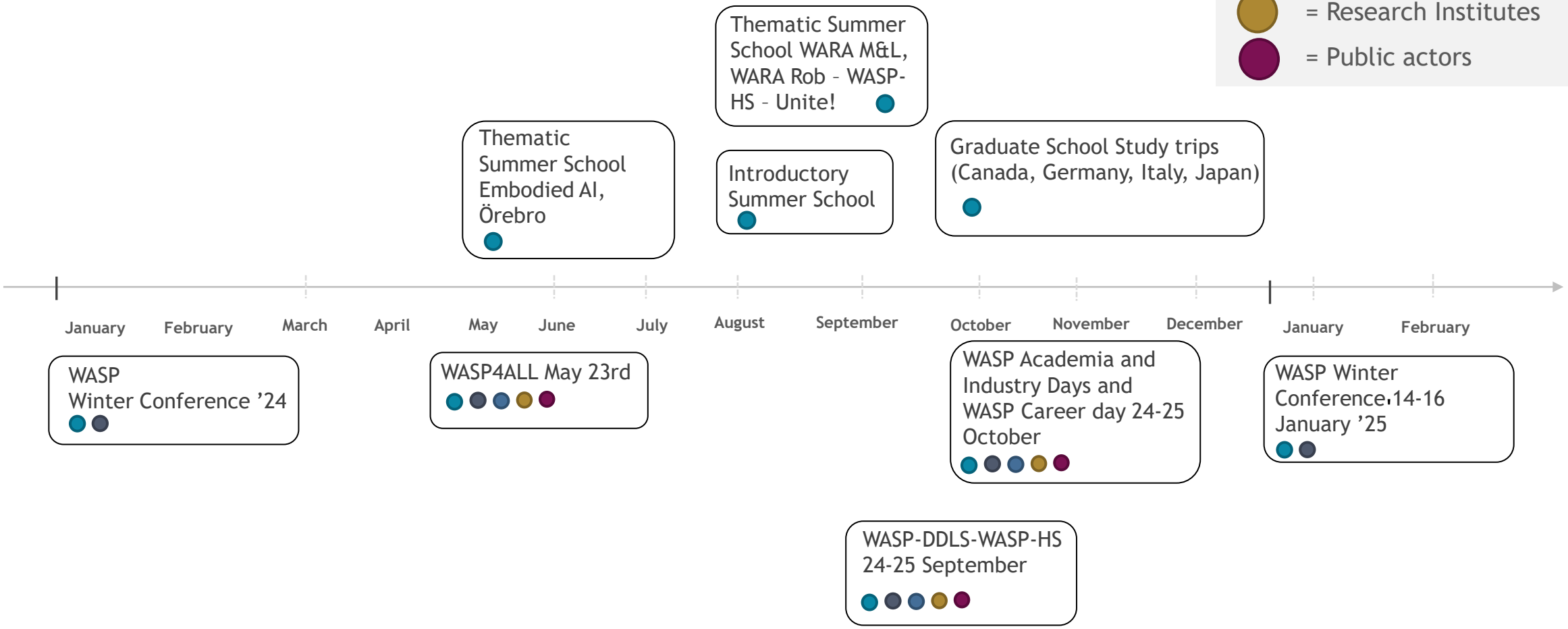
Events

Events and Activities 2024

= PhD Students
= Researchers
= Industry
= Research Institutes
= Public actors



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WASP Winter conference 2024

- >550 participants
- Poster sessions with >200 posters
- Cluster meetings
- Graduation ceremony
- Thesis of the year and other awards ceremony

Karl-Erik Årzén

WASP Co-Director

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Research in WASP

Research in WASP

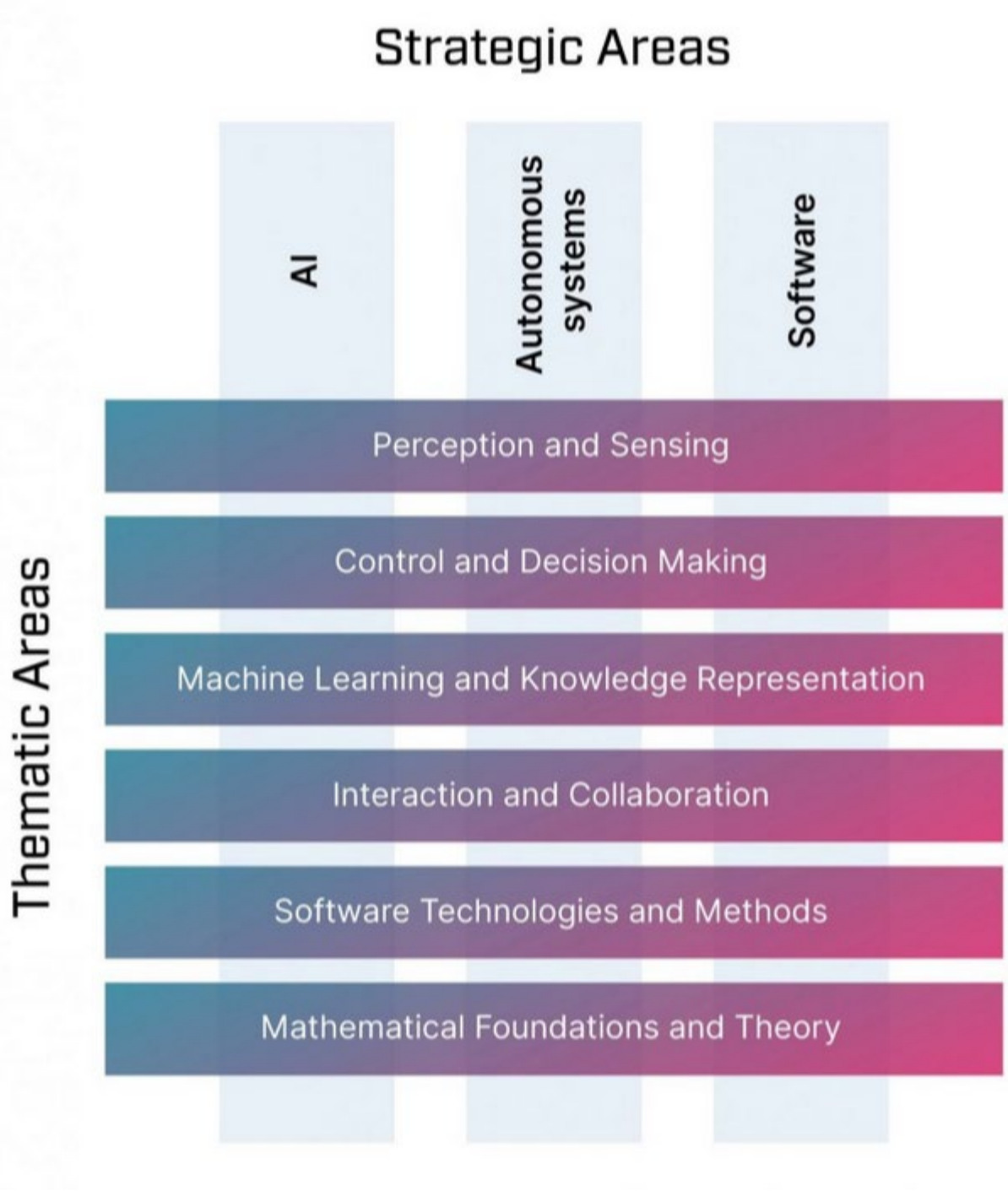
- When WASP started in 2015 the focus was Autonomous Systems (AS), including AI/ML and Software
  - WASP – Wallenberg Autonomous Systems Program
- Soon, software was separated out from AS
- In 2017/2018 it was decided to separate out AI/ML and increase the funding. Two tracks were created
  - AS
  - AI, split into
    - AI-MLX focused on Machine Learning
    - AI-MATH focused on Mathematics for AI/ML
- In 2023 Cyber-Security was included in WASP

WASP Research Areas

- Autonomous Systems (AS)
  - Research on autonomy, including enabling technologies for autonomous systems
  - Transport systems, self-driving vehicles, perception, interaction, visualization, human-machine collaboration, multi-agent systems, robotics, autonomous clouds and networks, security, localization, optimization, ...
  - Strong systems focus
  - Data-driven and/or model-based approaches (“WASP is not only AI”)
- Artificial Intelligence (AI)
  - MLX
    - Machine Learning, Deep Learning, and Next Generation/Explainable Learning
  - MATH
    - Mathematical Foundations of AI/ML
    - Theoretical Computer Science foundations of AI

WASP Research Areas

- Software (SW)
  - Both software methodology and software technology.
  - Software for the modelling, analysis, development, training, verification, and deployment of autonomous or AI and ML-based systems.
  - Software that contains or utilizes autonomy, automation, AI, learning, or feedback.
- Cyber-Security (CS)
  - Of relevance to AS, AI and SW



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WASP Researchers

The research is mainly performed by

- WASP PhD students
- WASP Postdocs
- WASP Recruited Faculty
- WASP Faculty

PhD students have been allocated through

- University PhD student call
- Industrial PhD student call
- WARA PhD student call
- NEST (larger projects with 4-5 PIs + PhD students/postdocs)
- Recruited Faculty package

WASP NESTs

- Projects that inherent:
  - Novelty
  - Excellence
  - Synergy
  - Teams
- First nine NESTs started in 2022
  - Strong focus on AI/ML
- Five NESTs on cyber-security started in 2024
- Calls for new joint NESTs with Data-Driven Life Science (DDLS) and Material Science (WISE) programs currently being evaluated

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Collaboration with other Wallenberg initiatives

KAW Funded Strategic Programs

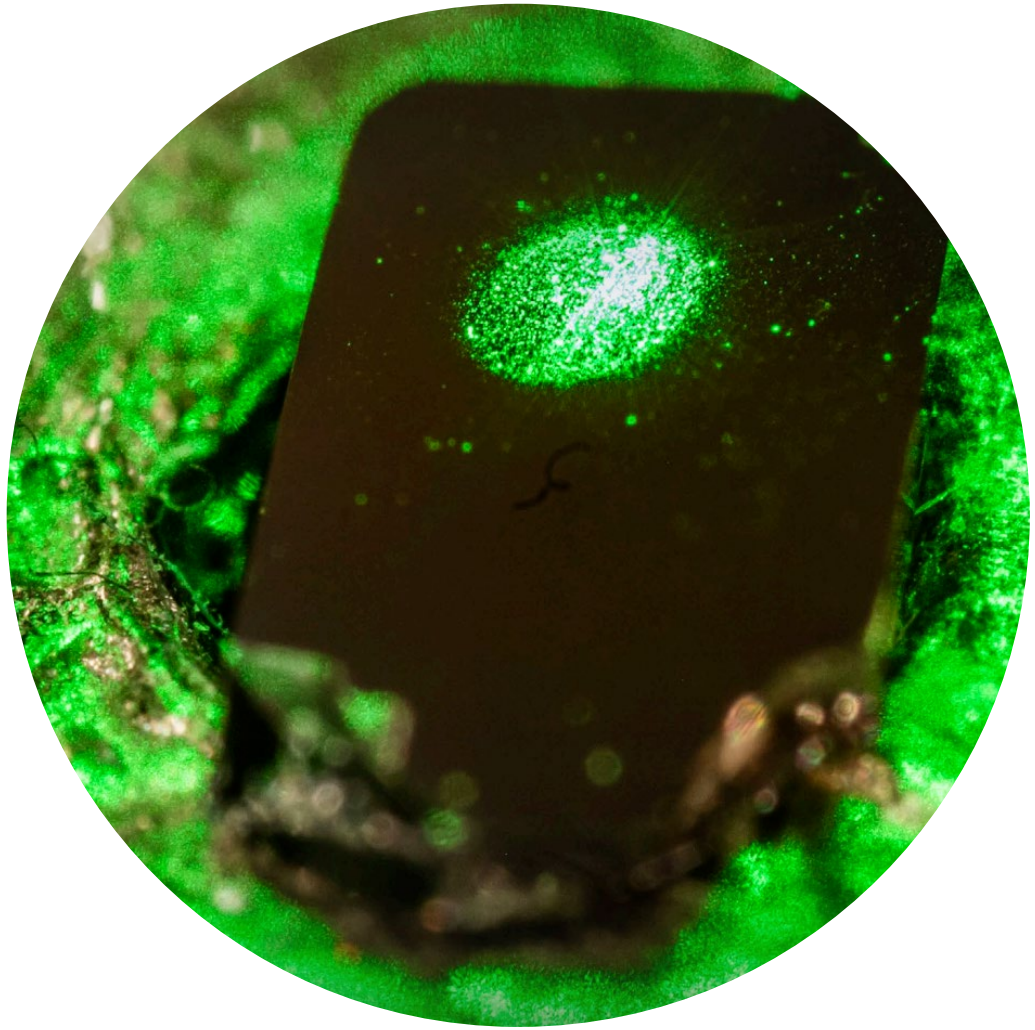
- The Wallenberg foundations fund several strategic programs
- Modeled after WASP
  - DDLS – Data-Driven Life Science
  - WISE – Materials Science
  - WACQT – Quantum Technology
  - WASP-HS – WASP Humanities and Society
  - …..
- Parts of WASP's budget is earmarked for collaboration with these

Continued and increased collaboration with Data Driven Life Science (DDLS)

- 225 MSEK until 2031
- First 15 approved projects in 2021
- Another 13 approved projects in 2023
- Call for joint NESTs in the fall of 2024

New collaboration with Wallenberg Initiative Materials Science for Sustainability (WISE)

- 120 MSEK until 2031
- First 28 pilot projects approved in 2023
- Next call for pilot projects in the fall of 2024
- Call for joint NESTs in the fall of 2024



Collaboration with WASP-HS

- 5 MSEK per year until 2031
- Potential call for joint PhD students and postdocs
- Joint summer schools and shared courses
- Joint conferences

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WASP Clusters

Clusters in WASP

- Networking is important in WASP
  - Course meetings, summer schools, study trips, …
- The aim of clusters is to create smaller networks of PhD students and faculty that have the same research interests
- Clusters may organize
  - Physical or virtual meetings
  - Organize international study trips (centrally funded)
  - Organize physical national meetings (cluster budget)
  - Provide feedback on research
  - Read and discuss papers
  - …….
- Participation is voluntary and clusters are dynamic
- Some clusters work better than others

Cluster Model

Three types of clusters:

- Core Technology Clusters (CTC)
  - Managed, proposed and led by WASP students
  - Focused on some core technology, theory, tool or method
- Application Clusters
  - Gather WASP Faculty and PhD Students within the same application area
  - Managed and led by WASP faculty
- Area Clusters
  - Gather WASP Faculty and PhD Students within the same technical area
  - Managed and led by WASP faculty

Each PhD student may participate in

- 0-2 Core Technology Cluster
- 0-2 Area or Application Cluster
- Maximum 4 clusters

Core Technology Clusters

- 3D Computer Vision
- Anomaly Detection *
- Complex Systems *
- Cryptography *
- Distributed Systems and Cloud Computing *
- Explainable AI
- Geometric Deep Learning
- Large-Scale Optimization *
- Learning from Small Data Sets and Incremental Learning
- Natural Language Processing
- Representation and Grounding *
- Safety and Robustness of Autonomous Systems *
- Sequential Decision-Making and Reinforcement Learning
- Software Analysis & Testing *

Clusters with an * are not holding a meeting at the winter conference

Application Clusters

7 clusters:

- Finance, Business Analytics & eCommerce *
- Smart Environments
- Life Science (also open for participation from Data-Driven Life Science (DDLS)) *
- Manufacturing & Process Control (incl Logistics and Predictive Maintenance)
- Mobile Communications
- Public Safety
- Transport Systems

Area Clusters

9 clusters:

- Autonomous Clouds and Networks
- Ethical, Legal and Societal Aspects (also open for participation from WASP-HS) *
- Localization and Navigation
- Machine Learning
- Mathematical Foundations of AI
- Perception and Learning
- Robotics
- Cybersecurity *
- Software Engineering & Technolog

Some examples

- Study trips
  - The CTC cluster Geometric Deep Learning in collaboration with the MLX Area Cluster has organized a study trip to Amsterdam
  - The Application cluster Transport Systems has organized a study trip to Italy
  - The Area cluster Autonomous Clouds and Networks has organized two study trips to Silicon Valley, CA
  - The Area cluster Security has organized a study trip to the ACM CCS conference in Copenhagen
- Research visits
  - Research visit to Saab and Combitech, Linköping organized by the CTC cluster Explainable AI

Signing up

You sign up or change your selection of clusters at

https://internal.wasp-sweden.org/networks-and-resources/clusters/

Cluster Meetings

Most clusters have Zoom meetings on Thu Jan 16 13:30 -14:30 or 14:45 – 15:45

Schedule available at

https://internal.wasp-sweden.org/wasp-winter-conference-14-16-january-2025/cluster-meetings/

New PhD students may attend cluster meetings also if they have not signed up yet (to learn)

Bo Wahlberg

Chair International Management Group

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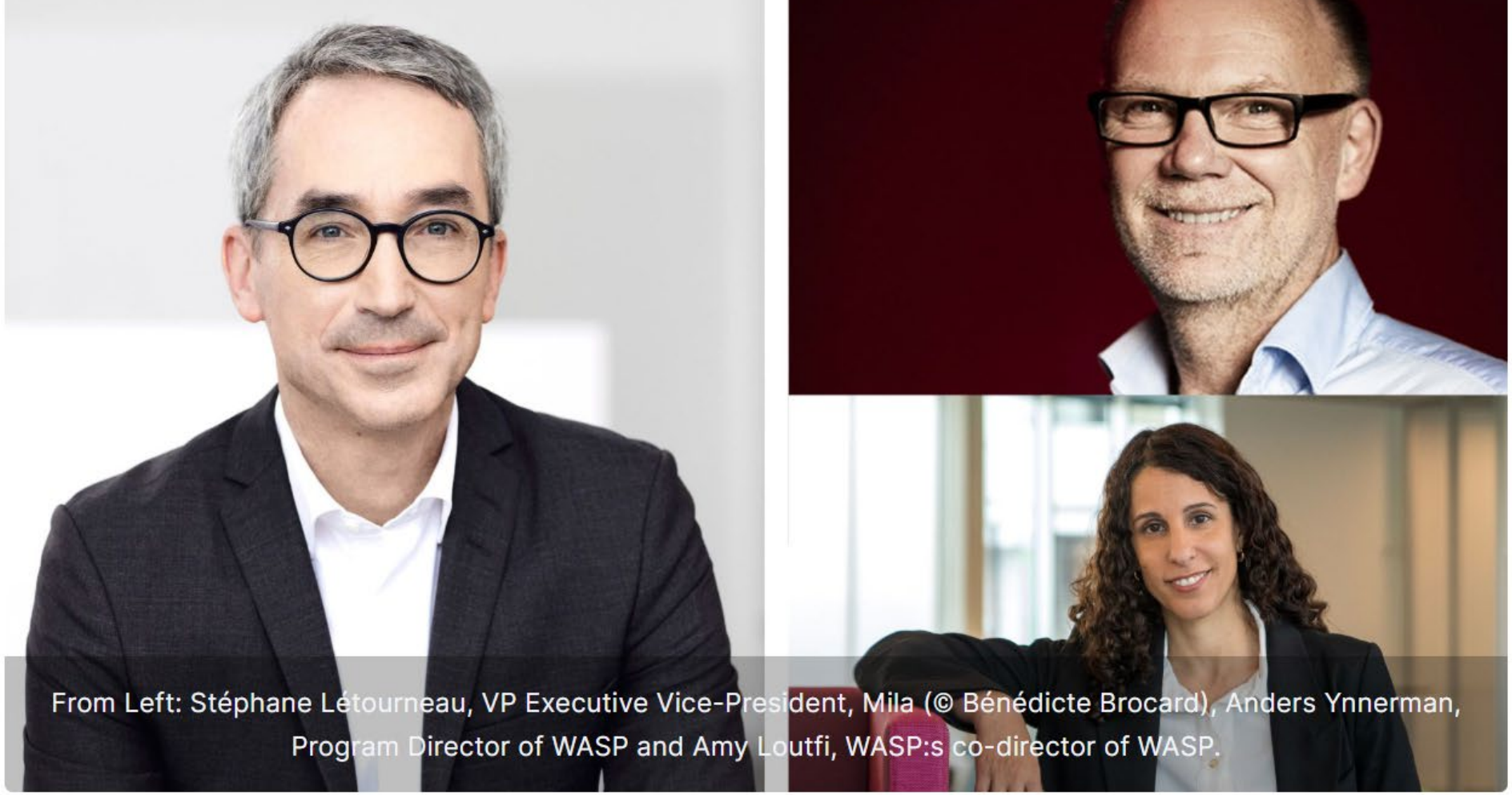
Internationalization

Bo Wahlberg, KTH
Chair International Management Group



From Left: Stéphane Létourneau, VP Executive Vice-President, Mila (© Bénédicte Brocard), Anders Ynnerman, Program Director of WASP and Amy Loutfi, WASP:s co-director of WASP.

Sweden's largest research program, Wallenberg AI, Autonomous Systems and Software Program (WASP), and the world's largest academic research center for deep learning, Mila – Quebec Artificial Intelligence Institute (Mila), have entered an academic partnership. The aim is to foster academic collaboration between Sweden and Canada within AI research, building on the strengths and complementary capabilities of both institutions.

December 16, 2024

Yoshua Bengio

Professor of computer science, University of Montreal, Mila, IVADO, CIFAR
Verified email at umontreal.ca - Homepage

Machine learning deep learning artificial intelligence

FOLLOW

TITLE	CITED BY	YEAR
Deep learning Y LeCun, Y Bengio, G Hinton nature 521 (7553), 436-444	90122	2015
Generative adversarial nets I Goodfellow, J Pouget-Abadie, M Mirza, B Xu, D Warde-Farley, S Ozair, ... Advances in neural information processing systems 27	89234 *	2014
Deep learning I Goodfellow MIT press	72418	2016
Gradient-based learning applied to document recognition Y LeCun, L Bottou, Y Bengio, P Haffner Proceedings of the IEEE 86 (11), 2278-2324	72204	1998
Neural machine translation by jointly learning to align and translate D Bahdanau arXiv preprint arXiv:1409.0473	37352	2014
Learning phrase representations using RNN encoder-decoder for statistical machine translation K Cho, B Van Merriënboer, C Gulcehre, D Bahdanau, F Bougares, ... arXiv preprint arXiv:1406.1078	32922	2014
Understanding the difficulty of training deep feedforward neural networks X Glorot, Y Bengio	26396	2010

Cited by

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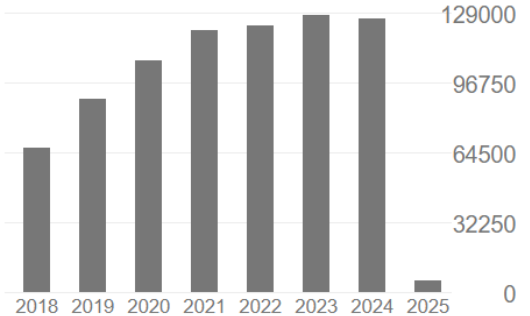
h-index	240	202
i10-index	901	782



Public access

VIEW ALL

7 articles — not available

144 articles — available

Based on funding mandates

Co-authors

VIEW ALL

Aaron Courville
Professor, DIRO, Université de …

International Research

- Annual study trips
- **Research stints abroad for *all* PhD students**
- *International WASP Postdoc program*

Main building, © ETH Zurich / Gian Marco Castelberg

The Wallenberg AI, Autonomous Systems and Software Program (WASP) and ETH Zurich have signed a Memorandum of Understanding to increase collaboration within research and programs related to AI, autonomous systems and software. This will further strengthen the research within this field.

International Partner Universities

- Stanford
- NTU Singapore
- UC Berkeley
- Aalto
- MIT

New Partners 2024

- Caltech
- ETH
- MILA
- Imperial College London

https://internal.wasp-sweden.org/wasp-handbook/how-to-for-phd-students/

The WASP Handbook

How-To for PhD Students

- New in WASP
- Clusters
- Communication
- Courses
- International study trips
- Publications
- Research Stints Abroad
- Summer Schools
- The WASP Winter Conference
- WARA

How-To for Teachers

A Kick-Start Tour

WASP Terms

Research Stints Abroad

WASP PhD students have the opportunity to apply for a short-term visiting researcher position abroad, in the range of one-six months.

Where can I Go?

What are the Time Limits?

Who can Apply?

Costs and Funding

How to Apply

Requisition

WASP International Postdoctoral Scholarships

Application deadline:
November 15, 2024

Annual Call

WASP, together with the Knut and Alice Wallenberg Foundation, invites applications for postdoctoral stipends. The two-year WASP scholarship is awarded for postdoctoral studies at leading universities worldwide.

In addition to being eligible to apply for the Knut and Alice Wallenberg Foundation's regular postdoc scholarships, an exclusive scholarship is available for WASP doctoral students upon completion of their dissertation.

The WASP International Postdoctoral Scholarship offers positions at top universities globally. This scholarship adheres the same criteria and conditions as other postdoc programs awarded by The Knut and Alice Wallenberg Foundation. Before applying, the candidates must first obtain a letter of invitation from a world-leading hosting researcher in a WASP related field. The hosting department shall also confirm that the position will be funded through a stipend.

Upon concluding the postdoc studies, scholars have the opportunity to apply for funding from WASP to support a research position at a Swedish university affiliated with WASP for up to two years, should they not secure another position.

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WASP Graduate School

WASP PhD students

Close to one PhD per week!

160+

Completed PhD Theses

500

Currently active PhD students

WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

Fredrik Heintz

Director WASP Graduate School

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10 YEARS

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Introduction to the WASP Graduate School

Fredrik Heintz & Daniel Axehill

Graduate School Directors

The Graduate School Mission

The mission of the WASP Graduate School is to educate PhDs with skills in **strategically important disciplines** within WASP, together with a **broad knowledge** of **AI, autonomous systems and software development.**

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Goals – Graduate School

We will organize **courses** and **activities** to provide you with **state-of-the-art knowledge** in **AI, autonomous systems and software**.

We will organize **courses** and **activities** that **respect** the needs of a **heterogeneous** group of students spread out over Sweden

We will provide **added value** to **your PhD** education.

We will provide **opportunities** to those that really want to **excel.**

WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

Goals – Students

Students should become knowledgeable **researchers** in the area of **AI, autonomous system or software**.

Students should form a strong sense of **belonging** to WASP connecting you together.

Students should get to know Swedish **industry**.

Students should form a strong and valuable **international** academic-industrial **network**.

Students should strive for **excellence.**

WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

WASP Graduate School Activities

General offer

Winter Conference	• Yearly conference for the WASP community where PhD students present their research and new PhD students are introduced to the program.
Summer Schools	• Annual Community Building Summer School for first year PhD students. • Thematic summer schools with varying topics for students in the 2nd year & above.
International Study Trips	• Two centrally organized study trips for students, in addition to trips arranged by the clusters and the PhD students themselves.
Research Stints Abroad	• Spend up to 6 months in a research group abroad. • Organized by the students.

Courses	• At least 27 credits, incl. 1 mandatory and 2 foundational courses. • Approximate workload: one 6 HP course per semester the first two years.

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WASP Graduate School Courses

Introductory courses (voluntary) *cannot be included in the required 27hp*	▪ Introduction to logics for AI (2hp) ▪ Introduction to Mathematics for Machine Learning (4hp)
Mandatory course	▪ Ethical, Legal and Societal aspects of AI and Autonomous Systems (3hp)
Foundational courses *(2 out of 4 required, select at most one out of AI & ML and Math for ML)*	▪ Autonomous Systems (6hp) ▪ AI and Machine Learning (6hp) ▪ Mathematics for Machine Learning (6hp) ▪ Software Engineering and Cloud Computing (6hp)
Advanced courses: At least 2 more courses required *(also any remaining foundational course can be selected)*	▪ Deep Learning (6hp) ▪ Deep Learning for NLP (6hp) ▪ Graphical Models, Bayesian Learning and SRL (6hp) ▪ Interaction, Collaboration, and Visualization (6hp) ▪ High Dimensional Statistics and Optimization (6hp) ▪ Learning Feature Representations (6hp) ▪ Learning Theory (6hp) ▪ Reinforcement Learning (6hp) ▪ Scalable Data Science (6hp) ▪ Topological Data Analysis (6hp) ▪ WASP Project Course (6hp)

WASP Graduate School Management Group (GSM)

Graduate School Directors: Fredrik Heintz, LiU & Daniel Axehill, LiU

GSM members

- **Chalmers**: Marina Axelson-Fisk (M)
- **KTH**: Florian Pokorny (AI)
- **LiU**: Daniel Axehill (AS)
- **Lund**: Elin Topp (AI/AS)
- **Umeå**: Paul Townend (SW/Cloud)
- **Uppsala**: Benny Avelin (M)
- **Örebro**: Stephanie Lowry (AI)

Adjunct members

- Karl-Erik Årzén, **LU** (WASP Co-director for research program coordination)
- Karol Wojtulewicz, **LiU** (Chair: WASP PhD Student Council)
- Ayesha Jena, **LU** (Vice chair: WASP PhD Student Council)

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Local Contact Points at Your University

Your representative in the University Representative Group (URG)

Financial officers at your university

Your representative in the PhD Student Council

Contact information on the WASP Intranet
https://internal.wasp-sweden.org/contacts/

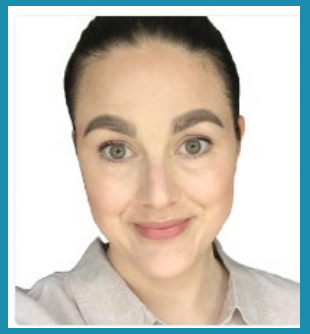
WASP Program Office - Staff

Program Coordination, Calls, Recruitments

Elina Hjertström

Michael Lögdlund

Maria Jonson



Marie Helsing Västfjäll

Graduate School, Events , Administration

Meaza Eshetu Abebe

Anna Björnemo

Camilla Smedberg

Communication

Natalie Pintar

Nelly Sahlstrand

Alina Roos

Financial matters

Sara Colling

Madeleine Forsman

Jessica Danielsson-Piazze

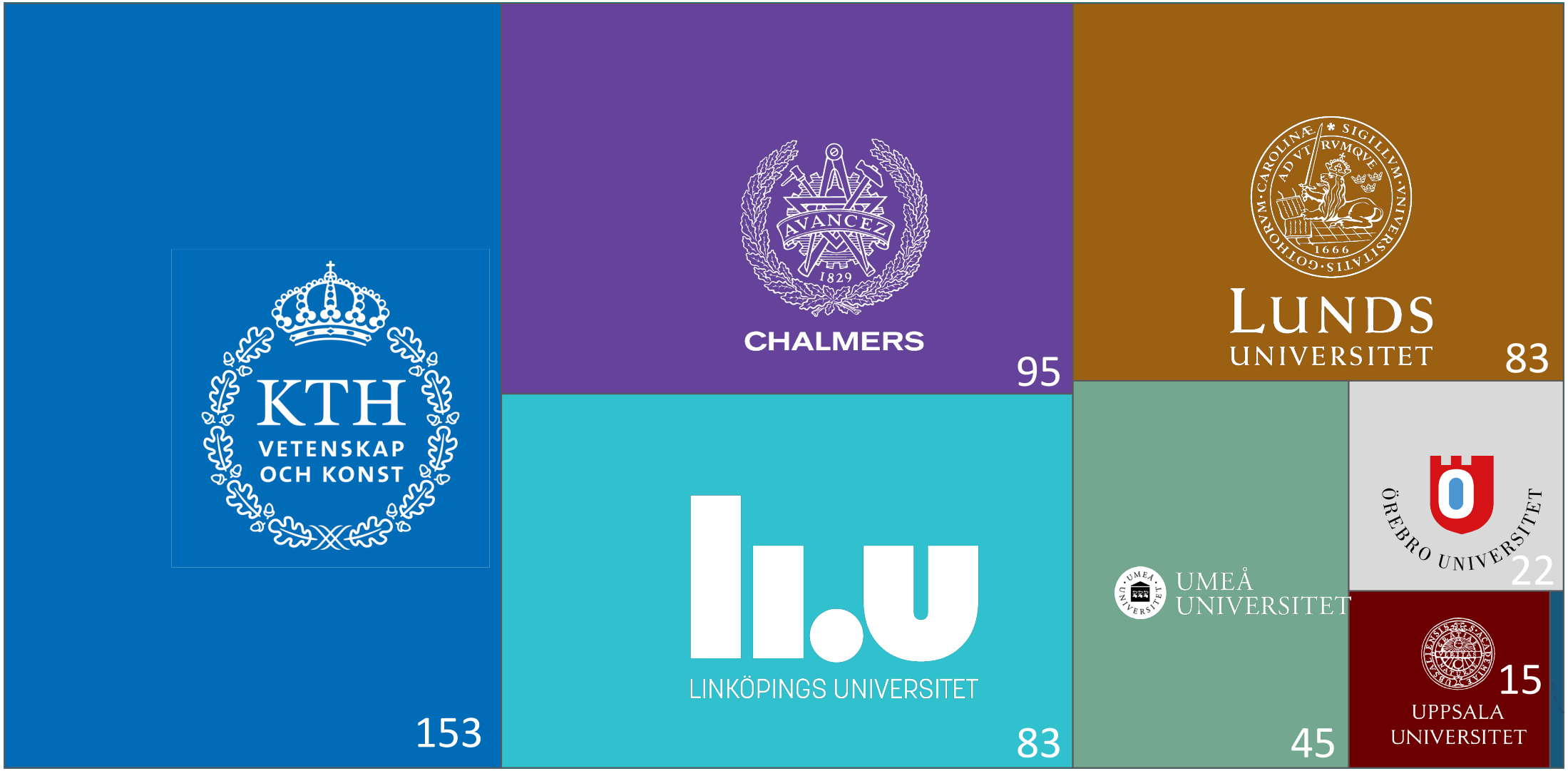
WASP Research Arenas (WARA)

Niclas Fock

Caroline Sturesson

Take the opportunity that WASP is and strive to do the most of it!

Number of active WASP PhD students per university, Jan 8, 2025



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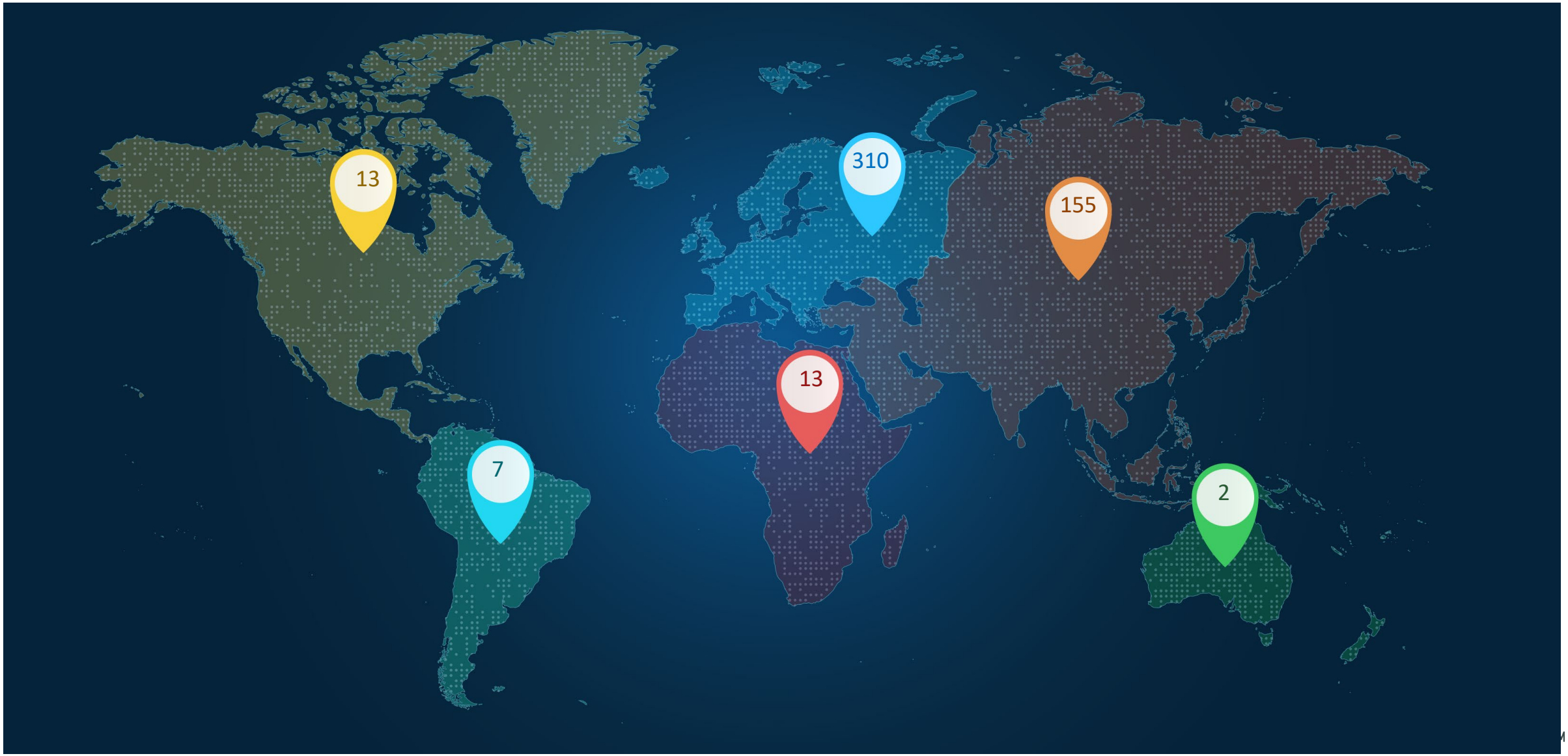
Number of active WASP PhD students based on nationalities



Instructions for PhD student group discussion

- Students split up in different groups according to the four WASP research areas: (Autonomous systems, AI/Math, AI/MLX, Software)
  - 10 persons in each table.
  - Tables are grouped based on research areas (see signs on tables)
  - Instructions at each table
- One on one: Introduce yourselves to each other, for example study background, research interests, etc.
- Around the table – Introduce your discussion partner to the rest of the group
- Remaining time – Discuss what interested you in the previous presentation and what you would like clarified (save questions for next session when you come back)
- **14:50 Program resumes** in Hemerycksalen

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Presentation on WASP courses and activities

Daniel Axehill, Director WASP Graduate School

Meaza Eshetu Abebe, Graduate School Coordinator

WASP Graduate School Activities (repetition)

General offer

Winter Conference	• Yearly conference for the WASP community where PhD students present their research and new PhD students are introduced to the program.
Summer Schools	• Annual Community Building Summer School for first year PhD students. • Thematic summer schools with varying topics for students in the 2nd year & above.
International Study Trips	• Two centrally organized study trips for students, in addition to trips arranged by the clusters and the PhD students themselves.
Research Stints Abroad	• Spend up to 6 months in a research group abroad. • Organized by the students.

Courses	• At least 27 credits, incl. 1 mandatory and 2 foundational courses. • Approximate workload: one 6 HP course per semester the first two years.

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WASP Graduate School Activities: General Offer

Winter Conference

Annual conference where everyone in WASP meet (mandatory)

Introduction to WASP

Get to know WASP and other students

Year 1

Poster Presentations

Receive friendly feedback on research

Year 2

Year 3 and on

Diploma

Celebrate your accomplishments with a diploma

Year 5

Summer Schools

Community Building Summer School

Get to know WASP and other students

Year 1 (mandatory)

Thematic Summer School(s)

Deepen your knowledge in an area

Year 2 (invited)

Year 3 and on (optional)

International Study Trips

(Two centrally arranged and two student arranged)

New knowledge and international networking

Year 1 (invited)

Year 2 (invited)

Year 3 and on (optional)

Research Stints Abroad

(1-6 months)

Conduct research and networking

Year 3 and on (optional)

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WASP Graduate School Activities: Course Schedule

Introductory, mandatory, foundational

Yearly courses

Spring

- Introduction to Mathematics for ML (4hp)
- Introduction to Logic for AI (2hp)
- Artificial Intelligence and Machine Learning (6hp)
- Mathematics for ML (6hp)
- Software Engineering and Cloud Computing (6hp)
- Ethical, Legal and Societal aspects of AI and AS (3hp)

Autumn

- Autonomous Systems (6hp)

Advanced

Courses given odd years only

Spring

- Deep Learning (6hp)
- Interaction, Collaboration and Visualization (6hp)

Autumn

- WASP Project Course (6hp)
- Topological Data Analysis (6hp)
- Graphical Models, Bayesian Learning and Statistical Relational Learning (6hp)

Courses given even years only

Spring

- Learning Theory (6hp)
- Deep Learning for Natural Language Processing (6hp)

Autumn

- High Dimensional Statistics and Optimization (6hp)
- Learning Feature Representations (6hp)
- Reinforcement Learning (6hp)
- Scalable Data Science and Distributed ML (6hp)

Activity Overview 2025

ACTIVITY	DATE	CLASS
Winter Conference 2025	January 14-16	All (Mandatory)
Joint WARA Summer School	June 23-27	AS Batch 1-3, AI Batch 1-2, Class 2021 - Class 2024 (Optional) Class 2025 (Invited)
Thematic Summer School 2	TBD	AS Batch 1-3, AI Batch 1-2, Class 2021 - Class 2024 (Optional) Class 2025 (Invited)
Community Building Summer School	August 25-29	Class 2025 (Mandatory)
Academia and Industry Days	October 6-7	All (Optional)

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Registration for WASP Courses

Personal invitations

- Registration spring semester courses opens around Nov-Dec
- Registration fall semester courses opens around May-June
- Course meeting dates are continuously updated in the WASP Intranet Calendar

Automatic admission

- Registration is binding, admission automatic
- Large class sizes: some courses fill up, de-register immediately if you change your mind
- Invitation to the KTH Canvas Learning Platform

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Learning Platform – KTH Canvas

WASP uses Canvas KTH as learning platform. WASP students (excl. KTH students) get assigned a user account with their e-mail address that PhD students actively use during their PhD studies.

Non-KTH students need to login as external users. You can find the link on the Intranet.

Registered students are invited to Canvas course pages where teachers post the schedule, material, assignments etc.

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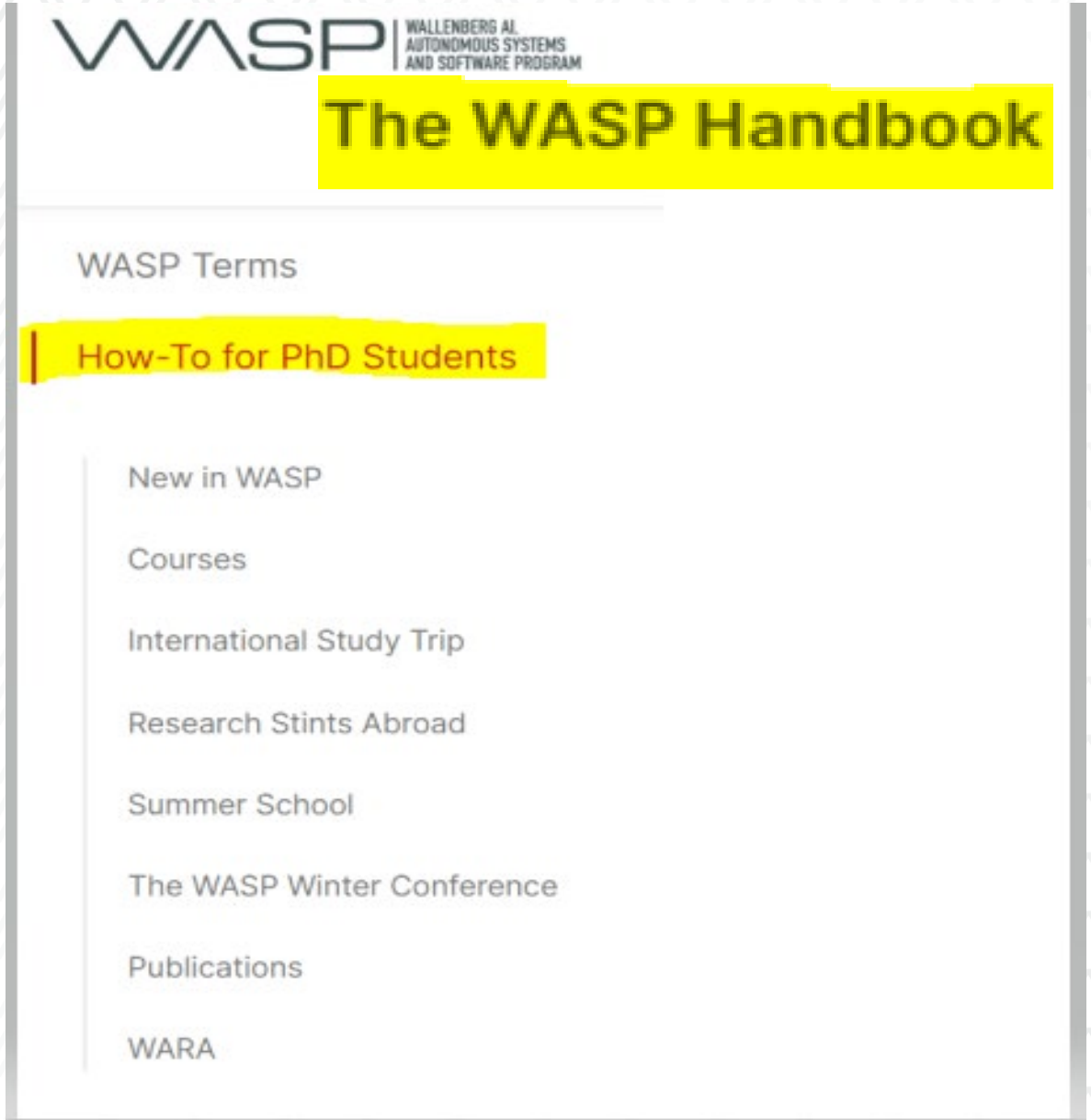
WASP Graduate School Activities: Budget/funding



- https://internal.wasp-sweden.org → **The WASP Handbook**→ How-To for PhD Students
- Guidelines regarding your budget is available in the document **"Instruktion rekvisition från WASP centralt rev 2024-10-22"** which is sent out to your local contact persons together with your decision letters

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DO's for WASP Courses and Activities

DO discuss	DO discuss your plans with your supervisor and get their approval before registration
DO respond	DO respond Yes/No to the invitations to the WASP activities
DO mark	DO mark the dates in your calendar, and keep the commitment when being offered alternative activities (teaching etc.) • WASP Course meetings are mandatory and given on-site. • A joint dinner is offered on the evening of the first course meeting.
DO book	DO book your own travel and accommodation • Courses often start with a joint lunch.
DO apply	DO apply for a visa (if needed) as soon as possible as waiting times may be long
DO use	DO use the Slack workspace to keep in touch with your fellow students ☺

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Benefit from unique infrastructures in the WASP Research Arenas

WARA – WASP Research Arenas are unique environments for collaboration between research and industry

- WARA Robotics
- WARA M&L (Media & Language)
- WARA PS (Public Safety)
- WARA Ops (Operational data)
- WARA Medicine

Students may engage in these arenas through events, such as demonstration weeks, study visits, summer schools, and the WASP project course

Overall goal: use the infrastructures in the thesis work!

For more information, visit the WASP external website https://wasp-sweden.org/research/research-arenas/ or their internal websites (via networks and resources)

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Becoming a WASP PhD student: a rewarding challenge!

- Being a PhD student is sometimes a challenge, it requires
  - Time
  - Endurance
  - Coping with uncertainty
- Important to plan to avoid collisions and reduce peak load
- High-altitude training for your future career!
- This is a great opportunity, make the most of it!

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LINKÖPING UNIVERSITY

CHALMERS UNIVERSITY OF TECHNOLOGY

LUND UNIVERSITY

KTH VETENSKAP OCH KONST

UMEÅ UNIVERSITY

AFFILIATED GROUPS OF EXCELLENCE AT

ÖREBRO UNIVERSITY

UPPSALA UNIVERSITET

LULEÅ TEKNISKA UNIVERSITET

Knut and Alice Wallenberg Foundation

Paul Townend

Associate Professor, Umeå University

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10 YEARS

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Clusters and Research Stints

Paul Townend

Associate Professor, Umeå University

Clusters

Networking is crucial for your career: **WASP Clusters** help you connect

Arrange meetings and workshops with like-minded WASP members

Take part in (fully-funded) international study trips

Cluster examples

Core technology
Managed by students

Anomaly Detection
Cryptography
Explainable AI
Large-scale Optimization
Natural Language Processing

Application
Managed by Faculty

Smart Environments
Life Science
Mobile Communications
Public Safety
Transport Systems

Area
Managed by faculty

Autonomous Clouds & Networks
Machine Learning
Robotics
Cybersecurity
Software Engineering

Supervisors: any number of Area and Application clusters

Students and postdocs: up to 2 core tech and 2 area or application clusters

Study trips

Within your cluster, you can arrange a (group) study trip abroad!

Autonomous Clouds & Networks cluster trip to Silicon Valley

August 10-15, 2024

Apple
Stanford
Berkeley
Amazon
LBNL etc.

Research stints abroad

WASP supports fully-funded (for full WASP PhDs and post-docs) research stints

A “stint” is considered a short-term visiting researcher position.
Stays are fully-funded (within a budget). Find an external host and apply.

Minimum length: **one month**
Maximum length: **one semester**

PhD students may apply for one long stay
or up to two shorter stays

Learn more about clusters and stints

Read the WASP Handbook (on the internal WASP website)

Look at the cluster meetings happening this week – attend those you are interested in

No cluster for your topic? Look into creating one.
The WASP slack is a good place to start

Natalie Pintar

Head of Communications, WASP Program Office

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10 YEARS

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WASP Communication

Natalie Pintar

WASP Winter Conference 2025

The Communications Team

Natalie Pintar

Nelly Sahlstrand

Alina Roos

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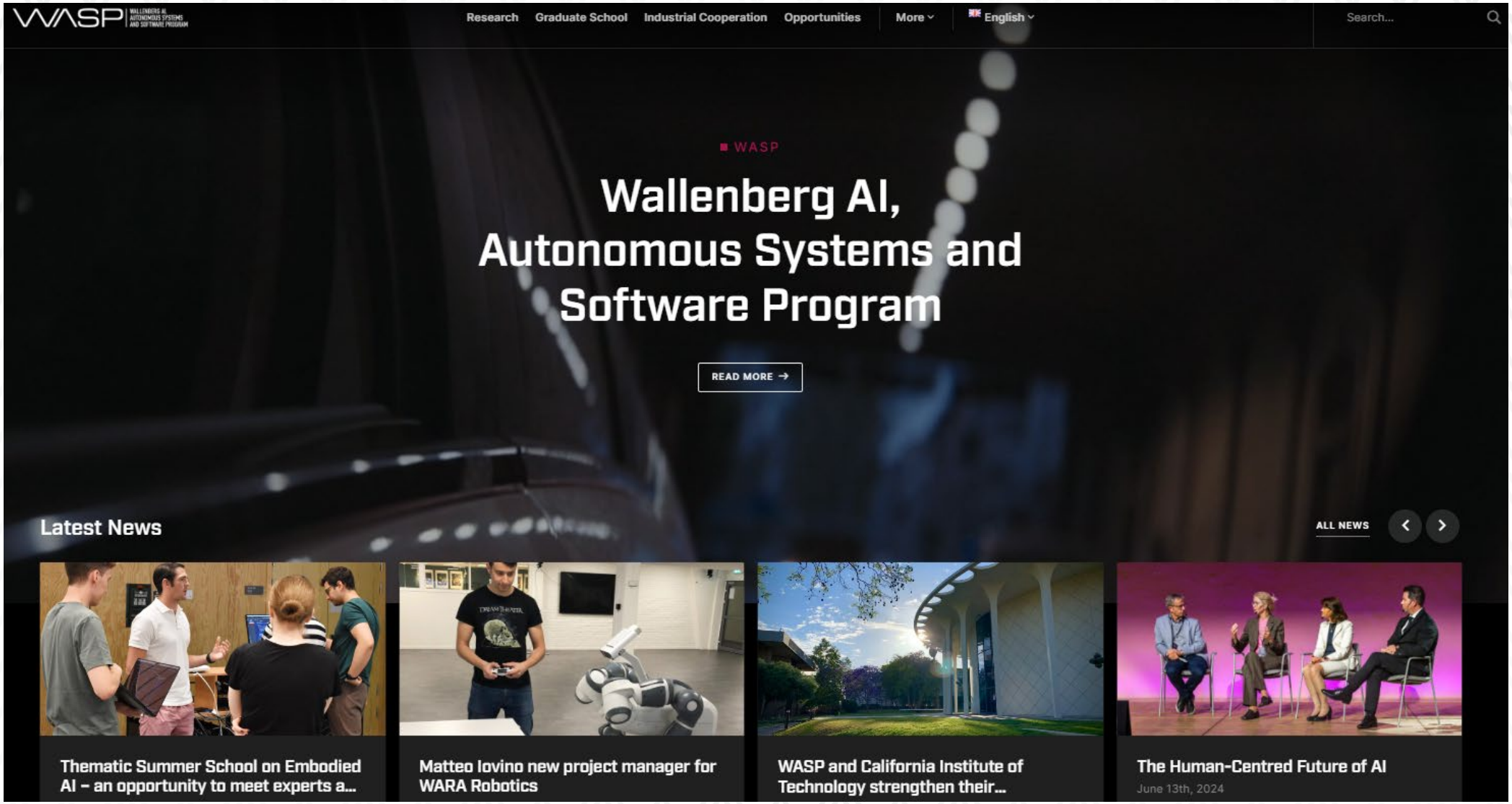
External Communication

- Website
- LinkedIn
- Newsletter
- YouTube
- Pressreleases
- Events



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geometric deep learning. She has previously studied at Lund University, ...more

Anna Björnemo and 101 others

1 comment • 1 repost

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8,411 followers

2mo •

– My research could potentially help towards the design of scalable control methods that ensure the satisfaction of the desired objectives providing formal guarantees on the systems' performance, says Maria Charitidou. ...more

Niclas Fock and 32 others

1 repo

KTH

Doctoral Thesis in Electrical Engineering

Control Synthesis for Multi-Agent Systems under Coupled Signal Temporal Logic Tasks: A Top-Down Model Predictive Approach

MARIA CHARITIDOU

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WASP NEWSLETTER MAY 2024

In this monthly newsletter we gather the latest news from the program, open calls, open positions, and upcoming events.

"I would definitely say that we are currently in an AI summer, possibly even in a heat wave"

On May 29, the latest episode of the podcast Innovationslandet was released. Emma Frans interviews Amy Loutfi, WASP Co-director and Professor at Örebro University.

The conversation revolves around the history of AI, today robotics, and a research. What we experience

The episode (in Swedish) can be found on various podcast platforms.

LISTEN TO THE EPISODE (Poddtoppen)

New advanced AI solutions will stop intruders accessing and leaking your data

– We will make it really difficult for attackers to identify people, buildings or areas for further dissemination, says Vicenç Torra in an interview with Umeå University.

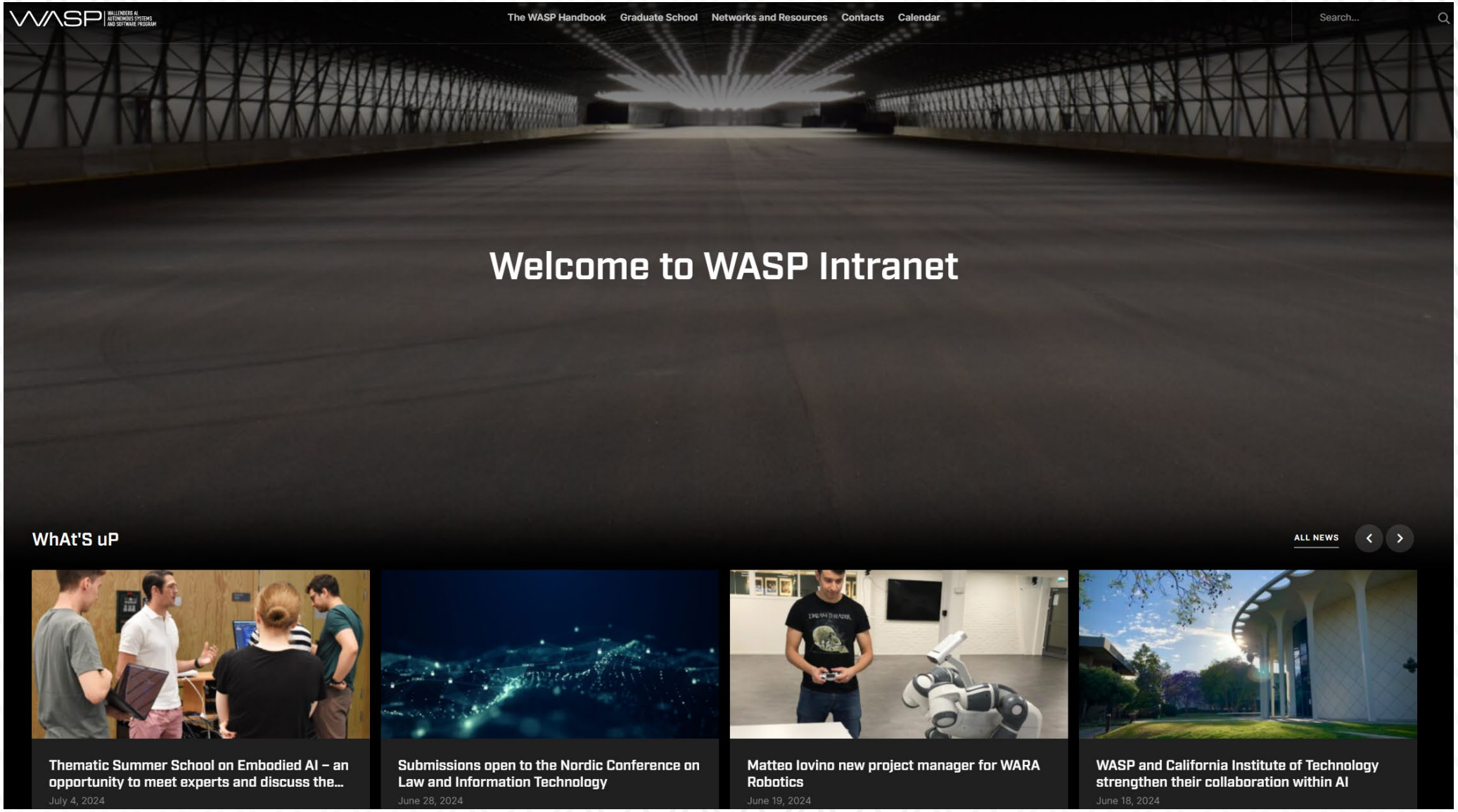
Subscribe to our newsletter

The WASP newsletter gathers news, recent activities and upcoming events within the program.

SIGN UP

Internal Communication

- Internal website
- Community Update (read it!)
- Slack
- Graphical profile
- WASP merch



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WASP COMMUNITY UPDATE JUNE 2024

Exploring AI for Science in Tokyo, Japan – a PhD student travel report

In March 2024 a group of WASP PhD students from Chalmers University of Technology and Lund University, specializing in AI for healthcare, molecular dynamics, and control theory, organized a study trip to Tokyo, Japan, to gain new perspectives on the theoretical and practical aspects of their research.

READ MORE

GRADUATE SCHOOL INFORMATION

WASP Graduate School Courses Fall 2024

Registration for the WASP courses fall semester 2024 is open until July 31.

Personal invitations has been sent out to all PhD students. Please contact the WASP Program Office if you have not received an invitation.

Course information, requirements and time schedule

For information about the courses, see: WASP Graduate School Courses

For course requirements, see: Curricula

For an overview of the time schedule, see: WASP intranet calendar

Attending the Community Building Summer School?

The program for the Community Building Summer School 2024 is now available.

The week will bring lectures, group exercises, a dome demonstration, company visits, and time to get to know other PhD

Slack

Slack is the main communication channel for reaching out to the community.
Information from the program office is not very common – it's your platform.

Channels for:

- Clusters
- Study trips
- Courses and summer schools
- Local channels for each "WASP city"
- Specific common interests, such as Berzelius

You will be invited today!

Graphical Profile

The graphical profile is used to support visibility for WASP and to guide you when creating material related to your research or other engagement in WASP.

On the intranet – Networks & Resources – Documents & Templates you find:

- Graphical Profile Manual
- WASP logo in various formats
- Presentation and poster templates
- Digital meeting backgrounds

WASP Merch

The communications team makes sure that you have the possibility to show your affiliation to WASP.

Normally in stock:

- T-shirts
- Stickers
- Laneyards
- Tote bags
- Gifts for speakers and hosts

Get your WASP backpack!

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Get in touch

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