WASP-ED
Open Information Meeting

20 April 2022

LINKÖPINGS UNIVERSITET

Program

- 10.00 – 10.40 Overview of WASP-ED (Fredrik)
- 10.40 – 10.55 Q&A
- 10.55 – 11.05 Break
- 11.05 – 12.00 Round table discussions
  one breakout room for each work area

The overview presentation will be recorded.

WASP-ED

Wallenberg AI and Transformative Technologies Education Development Program

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LINKÖPINGS UNIVERSITET

Outline

- Background
- Purpose and Objectives
- Organization
- Work Areas
- Summary
- Questions

Uppdrag

UTLYSNING KURSUTVECKLING GRUNDUTBILDNING

Marianne och Marcus Wallenbergs Stiftelse (MMW) ser det angeläget att universiteten implementerar de nya kompetenser som kommer fram inom WASP och WASP-HS området i grundutbildningen.

MMW inbjuder därför WASP och WASP-HS att tillsammans ansöka om totalt 20 Mkr för utveckling av kurser på grundläggande nivå. Medlen avser ramanslag som kan utlysas i konkurrens för forskare vid lärosäten som ingår i respektive centrumbildning Målsättningen skall vara att ta fram digitala kurspaket om AI och andra transformativ teknologier som skall vara tillgänglig för alla svenska lärosäten.

För att komma ifråga för finansiering skall minst tre lärosäten vara inblandad i ett specifikt utvecklingsprojekt.

Kursutveckling kan omfatta specifika teknikkurser men också introduktionskurser för professionsutbildningar.

Bidrag till kursutveckling kan omfatta såväl enstaka kurs på kandidat eller masternivå, eller inslag i programutbildning.

Ansökan skall vara MMW tillhanda senast 1 oktober 2021.

Marianne och Marcus Wallenbergs Stiftelse

Ingrid Sundström

Initial Working Group

- Amy Loutfi, Örebro (WASP)
- Anna Foka, Uppsala (WASP-HS)
- Fredrik Heintz, Linköping (WASP / WASP-HS)
- Jan ’Gulan’ Gulliksen, KTH (WASP)
- Jonas Ivarsson, Göteborg (WASP-HS)
- Anders Ynnerman, Linköping (Director WASP)
- Virginia Dignum, Umeå (Director WASP-HS)

WASP-ED: Purpose and Expected Impact

- The purpose of WASP-ED is to significantly increase the capability and capacity of Swedish universities in providing timely, relevant, and scalable education in AI and other transformative technologies.
- The expected impact is a national step-change in the quality and quantity of available competence in AI and the capability of addressing the need for such professional competence in coming transformative technologies.
- The focus is on higher education and professional development.

WASP-ED: Challenges

The fundamental challenge that WASP-ED is designed to address is how the Swedish educational system can deliver the necessary competence when the demand for competence in new technologies explodes and vastly broadens.

Three particular challenges are to:

1. **Reach a commonly agreed subject matter content** as the subject is being actively and rapidly developed.
2. **Introduce AI in education beyond only the specialized education programs** for technical experts, as the need for competence spreads from the experts developing the technology to much broader ranges of professions and disciplines.
3. **Increase teaching capacity** both to scale-up technical education to broader audiences and to scale-out AI education into other professions and disciplines.

WASP-ED: Objectives

1. **Provide the educational foundations** for AI and related transformative technologies.
2. **Scale-up the national educational capacity** in AI and transformative technologies including educating and maturing the teaching staff to make use of and be innovative in the application of AI and transformative technologies in education.
3. **Scale-out education** in AI and transformative technologies **to disciplines and professions beyond the technical core.**
4. **Develop data-driven education and pedagogical transformation** using learning analytics.

WASP-ED: Work Areas

WA3 Course Development
Develop modular course content

WA6 Teaching Competence Development
Provide professional development support for teachers

WA2 Program Development
Develop flexible and adaptable course packages for different roles

WA5 Technical Platform and Education Data
Provide a technical platform for delivering courses and course content

WA1 Curriculum Development
Provide a comprehensive overview of the subject matter content

WA4 Pedagogical Development and Learning analytics
Provide support for pedagogical experimentation and development

WASP-ED: Organization

- The program is led by a Program Director *Fredrik Heintz* (10% FTE) and a Program Coordinator *TBD* (80% FTE).
- Each work area is led by a Work Area Director and a Co-Director (5% FTE each).
- Each work area has a budget for specific projects that each should involve at least three universities.
- Program-level coordination and decisions are taken by a Program Management Group consisting of the Program Director, the Program Coordinator and the Work Area Directors. The Work Area Co-directors are deputies in the PMG.

WASP-ED: Organization

- Program Director: **Fredrik Heintz, LiU**
- Program Coordinator: *Being recruited, LiU*
- Leader WA1 (Curriculum): **Helena Lindgren, UmU**; co-lead Fredrik Heintz, LiU
- Leader WA2 (Program): **Amy Loutfi, ÖrU**; co-lead Alan Said, GU
- Leader WA3 (Course): **Mikael Sundström, LU**; co-lead Anna Foka, UU
- Leader WA4 (Pedagogy): **Teresa Cerrato-Pargman, SU,** co-lead Olga Viberg, KTH
- Leader WA5 (Platform): **Jan Gulliksen, KTH**; co-lead Joakim Lilliesköld, KTH
- Leader WA6 (Competence): **Thomas Hillman, GU**; co-lead Kristin Ewins, ÖrU
- *Supported by the WASP and WASP-HS program offices*

WA1: Curriculum

Helena Lindgren, Umeå University
Fredrik Heintz, Linköping University

Purpose and Plans

- Provide the foundations for educational activities in AI by identifying and agreeing on the subject matter content and based on this developing a WASP-ED curriculum in the style of the ACM Computer Science Curriculum.
- An important aspect of the curriculum will be the ethical, legal, societal aspects of AI and transformative technologies. It is important to emphasize that the curriculum is intended to be much broader than what can fit in any specific education program and should rather be the union of everything that is covered in different educations.
- Expected outcomes
  - A framework and process for developing and maintaining a national curriculum on AI and transformative technologies.
  - A concrete curriculum for AI, in a broad and inclusive sense, in the style of ACM CS curriculum, focusing on Swedish higher education with a global perspective.
  - An inventory of existing courses and education programs relative to the curriculum, across all Swedish higher education institutions.

Hybrid AI **Sustainable AI** **ELSEC in AI**

Search and Optimization

Knowledge Representation and Reasoning

Machine Learning

Agent-Based and Multiagent systems

Humans and AI/Human-AI Collaboration

Trustworthy AI*

Constraints and Satisfiability

Scheduling and Planning

Reinforcement Learning

Natural Language Processing

Computer Vision

Distributed and Edge AI

Robotics, Control and Autonomous Systems

AI Curriculum Another Attempt

Topics

1. Agent-based and Multi-agent Systems
2. Distributed and Edge AI
3. Human-AI collaboration
4. Hybrid AI
5. Knowledge Representation and Reasoning
6. Machine Learning
7. Reinforcement Learning
8. Search and Optimization
9. Trustworthy, Safe, and Sustainable AI

Important area covering multiple topics:

1. AI in the sciences
2. Computer Vision
3. Constraints and Satisfiability
4. Ethical, Legal, Economical, Social and Cultural Aspects
5. Natural Language Processing
6. Planning and Scheduling
7. Robotics and Autonomous Systems

How to Engage?

- Join us in the WA1 breakout room!
- Join a workshop on June 7th.
- Contribute to the inventory of courses and programmes relating to the curriculum.
- Contact: helena@cs.umu.se or fredrik.heintz@liu.se

WA2: Program Development

Amy Loutfi, Örebro University
Alan Said, Göteborg University

Purpose and Plans

- Push the development of new education programs in AI and to help universities accelerate the introduction of AI related content into existing programs.
- Expected outcomes
  - An overview of the need for different education programs covering the very broad area of AI and related transformative technologies.
  - A set of strategies and methods for accelerating the introduction of AI and related transformative technologies into existing education programs.
  - At least three blueprints of educational programs that could be adapted by partner universities.
  - At least one pilot-program developed together with at least one partner university, preferably three or more.

How to Engage?

- One can join the working group either to collect lessons learned at your own university, to collect and browse other initiatives, or to be part of the round table discussion.
- One can also send a message in the chat or come to our breakout room and share your interest.
- Please contact:
  - Amy Loutfi: amy.loutfi@oru.se
  - Alan Said: alan.said@ait.gu.se

WA3: Course Development

Mikael Sundström, Lund University
Anna Foka, Uppsala University

Purpose and Plans

- Develop courses and course modules based on the WASP-ED curriculum that can be introduced either as new courses or as part of existing courses at our universities.
  - To maximize the impact, modules should be designed in a flexible way to make them easy to integrate into existing university courses.
  - Priority is given to courses that are open and online to reach the largest possible audiences. Priority is also given to courses that give university credits. Courses should preferably be developed by multiple universities.
- Exploring “Constantly running” micro-credit courses in Python linking up three different universities:
  - First: 5 credits in Lund; Second: 5 credits in Uppsala; Third: 5 credits in Linköping
  - Possible collaborations using similar format with other thematic foci
- Aiding setup of “normal” courses relevant to AI
- Taking general inventory of AI-related course needs

How to Engage?

- Planned brainstorming session on **May 18**.
  Please contact Anna Foka if you wish to attend.
- Course ideas can be sent our way at any point.

WA4: Pedagogical Development and Learning Analytics

Teresa Cerrato-Pargman, Stockholm University
Olga Viberg, KTH

Purpose and Plans

- Develop and evaluate new pedagogical methods and tools, such as data-driven learning analytics, to support scaling-up and scaling-out education in AI and transformative technologies. The goals are to provide a solid pedagogical and educational basis for data-driven decision making in education that would ultimately lead to improved learning and teaching at scale.
- Leverage AI to support education, both on the course and the program level. This could for example be in the form of data-driven learning analytics. Special emphasis should be placed on how AI can benefit the pedagogical methods of delivering the content.
- Expected outcomes
  - A set of guidelines to design and implement open higher education initiatives for improved learning and teaching at scale.
  - Demonstrating the use of learning analytics for better learning and scaling up on at least one pilot course
  - A guiding framework for responsible learning analytics, including privacy enhancing mechanisms that would protect and enable stakeholders' (i.e., teachers' and students') agency in learning analytics settings.
  - At least one example of an open data initiative.
  - An open online self-paced course on learning analytics for teachers in higher education.

How to Engage?

- Contribute to a national survey addressing university teachers and other relevant higher education stakeholders to map their needs, hopes, and concerns in relation to:
  - teaching AI in their programs and courses,
  - using student (digital) data and analytics to design pedagogical interventions aimed to improved learning, learner support, and teaching at scale,
  - trusting learning analytics & AI educational tools,
  - building a central/universal resilient technical infrastructure.
- Planned to be distributed after the summer.

WA5: Technical Platform and Education Data

Jan Gulliksen, KTH
Joakim Lilliesköld, KTH

Purpose and Plans

To collaborate nationally to deliver online courses and support data-driven learning analytics, an appropriate technical platform is needed. Today, universities use a wide variety of platforms, most of which are closed and do not provide the detailed data needed to support novel data-driven pedagogical methods. A study will be conducted on the requirements of such a platform and an evaluation of how existing platforms satisfy these requirements. Based on this study, a platform will either be selected or commissioned.

A parallel study on the collection and curation of education data will also be done and we will work closely to with this group (see WA4).

Planned work:

- An analysis of different initiatives to build a universal platform (for instance Unite, EIT, and other initiatives)
- One or several round table discussions on experience from previous initiatives at Swedish universities
- A study/survey on the requirements of a technical platform suitable for WASP-ED and an evaluation of how existing platforms satisfy these requirements.
- At least one pilot project to show the effect of the technical platform.

How to Engage?

- Contribute to a national survey in cooperation with WA4.
- One can also join the working group either to collect lessons learned at your own university, to support in collecting other initiatives to create a common platform, or to be part of the round table discussions.
- Send a message in the chat or come to our breakout room and share your interest.
- Please contact:
  - Jan Gulliksen: guliksen@kth.se
  - Joakim Lilliesköld: joakiml@kth.se

WA6: Competence Development

Thomas Hillman, Göteborg University
Kristin Ewings, Örebro University

Purpose and Plans

- Purpose
  - Increase AI competence among university teachers
    - Technical, social, cultural & professional issues
  - Scale-out AI as a topic of concern across subject areas
    - Relevant teaching about AI beyond technical programs

- Plans
  - Involve centers for university teaching as hubs
  - Develop & deliver competence development activities
    - Workshops aimed at different groups of subject areas
    - Community building events across universities and subject areas

How to Engage?

- Join us in the WA6 breakout room to brainstorm:
  - Appropriate competence development expectations?
  - Needed support for university teachers?
  - Subject area differences?

- Send your thoughts or expressions of interest to thomas.hillman@gu.se

WASP-ED Summary

- Purpose: significantly increase the capability and capacity of Swedish universities in providing timely, relevant, and scalable education in AI and other transformative technologies
- 3-year program with a budget of 18.6 MSEK + co-funding
- Objectives: 1) Provide educational foundations
  2) Scale-up the national educational capacity
  3) Scale-out education to disciplines and professions beyond the technical core
  4) Develop data-driven education and pedagogical transformation
- Work areas:

WA3 Course Development Develop modular course content	**WA6 Teaching Competence Development** Provide professional development support for teachers
WA2 Program Development Develop flexible and adaptable course packages for different roles	**WA5 Technical Platform and Education Data** Provide a technical platform for delivering courses and course content
WA1 Curriculum Development Provide a comprehensive overview of the subject matter content	**WA4 Pedagogical Development and Learning analytics** Provide support for pedagogical experimentation and development

- **We strive to be open and inclusive!**