

Generative AI in Computer Science Education

We are excited to announce the **third workshop of the Generative AI in Computer Science Education working group**.

Date: 28 May, 2024 (Tuesday)

Address: Study Centre Utrecht (Open Universiteit), Vondellaan 202, 3521 GZ Utrecht

Free registration: Please send an e-mail to Ebrahim Rahimi (ebrahim.rahimi@ou.nl) by 23rd May (Thursday) if you would like to attend.

Program

10:00 - 10:30 Walk-in

10:30 - 10:45 Welcome, introduction, and updates

10:45 - 11:30 Presentation 1: **Personalized AI Assistance for In-IDE Learning of**

Programming by Anastasiia Birillo (JetBrains).

Abstract: Recently, JetBrains introduced a new approach to programming education. This approach is called in-IDE learning and is implemented through the JetBrains Academy plugin, which extends JetBrains IDEs for learning purposes. Students often lack personalized help in solving programming problems. This problem remains the same for in-IDE learning. To solve this problem, we developed a new AI-based assistant that analyses the student's solution and generates a next-step hint to help the student solve the task. In this approach, we combined the power of IDE static analysis and state-of-the-art LLMs to achieve good quality. We will present the key concepts used in this approach, the main challenges we faced, and our future plans.

11:30 - 11:45 Break

11:45 - 12:30 Presentation 2: **Exploring Generative AI in Computing Education at**

Utrecht University by Hieke Keuning & Isaac Alpizar-Chacon (Utrecht University).

Abstract: We will present several initiatives on Generative AI in computing education at Utrecht University. These include results from an ongoing educational project in which we study teacher and student perspectives, our recently launched website with a teacher toolkit, as well as several research studies on this topic.

12:30 - 13:30 Lunch

13:30 - 14:15 Group discussion: **Utilizing the agentic nature of GenAI in CS education**

As an alternative to an article, we chose a practice-oriented series of blog posts by Andrew Ng, one of the leaders in AI in the world. These blog posts basically form an academic tutorial about

the use of generative AI in a state-of-the-art way. The pages include a number of research references if someone wants to dig deeper in some particular aspects.

- Agentic Design Patterns Part 1: <https://www.deeplearning.ai/the-batch/how-agents-can-improve-llm-performance/>
- Agentic Design Patterns Part 2, Reflection: <https://www.deeplearning.ai/the-batch/agentic-design-patterns-part-2-reflection/>
- Agentic Design Patterns Part 3, Tool Use: <https://www.deeplearning.ai/the-batch/agentic-design-patterns-part-3-tool-use/>
- Agentic Design Patterns Part 4, Planning: <https://www.deeplearning.ai/the-batch/agentic-design-patterns-part-4-planning/>
- Agentic Design Patterns Part 5, Multi-Agent Collaboration: <https://www.deeplearning.ai/the-batch/agentic-design-patterns-part-5-multi-agent-collaboration/>

Having read these short, interesting posts, we aim to discuss the educational consequences during the workshop.

14:15 - 14:30 Break

14:30 - 15:15 Presentation 3: **AI trends, what would they mean for education?** by Bertine van Deyzen (SURF).

Abstract: Let's discuss AI trends and what they would mean for education. Additionally, we would like to collect your wishes and needs for a low-effort experimental environment for AI-models.

15:15 - 15:30 Wrap-up

15:30 - 16:15 Drinks

About the working group Generative AI in Computer Science Education

In computer science and software engineering education, the power of generative AI, such as ChatGPT, has emerged as a transformative opportunity. To foster innovation and improve teaching methods in this domain, it is crucial to facilitate collaboration among researchers and educators from universities in the Netherlands, spanning both academic levels, including research-intensive universities (WO) and universities of applied sciences (HBO). By pooling the collective expertise of these diverse institutions, we can generate a dynamic exchange of ideas, methodologies, and resources, ultimately shaping best practices for applying generative AI in higher education and forming joint projects. This initiative aims to bridge the gap between theory and practice, improving the teaching and learning experiences within computer science and software engineering programmes, and ensuring that students are well-equipped with cutting-edge skills.

Organisers: Ebrahim Rahimi (Open Universiteit) and Greg Alpar (Radboud University).