ETH zürich

ICB seminar series 2024/25
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GENERATIVE ARTIFICIAL INTELLIGENCE FOR CHEMICAL PROCESS ENGINEERING

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ETH Hönggerberg, HCI J 7

Abstract: Generative AI has gained immense traction across diverse sectors, exemplified by ChatGPT's language generation and GitHub Copilot's code generation. Generative AI also holds immense potential to reshape chemical process engineering by offering advanced data handling, modelling, and decision-support capabilities, ultimately driving innovation and efficiency in the industry. However, there are only limited applications in chemical engineering so far.
In my talk, I will give an overview of opportunities for GenAI for process engineering. I propose promising applications for generative AI in process engineering including autocompletion of flowsheets, autocorrection of engineering documents, P&ID generation, and AI-assisted HAZOPs. My talk will discuss three main areas of development: (1) data, (2) information representation, (3) model architectures including mechanistic information. I will further demonstrate our web application for the digitization of Piping and Instrumentation Diagrams that uses computer vision algorithms transforming PDF documents in smart P&IDs.

Bio: Artur M. Schweidtmann is a tenured assistant professor for chemical engineering at Delft University of Technology and director of the Process Intelligence Research lab (www.pi-research.org). His research focuses on the combination of artificial intelligence (AI) and chemical engineering. He received his Master of Science from RWTH Aachen University in 2017 and defended his Ph.D. from RWTH in 2021, both in Chemical Engineering. During his studies, he spent the academic year 2013/2014 at Carnegie Mellon University as a visiting student via the DAAD ISAP program. He performed his Master thesis at the University of Cambridge.

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