

Kolloquiumsvortrag

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AI-Driven Educational Technology for Introductory Programming.

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Computational thinking and basic programming skills are essential for everyone to thrive in nowadays digital society. Consequently, there is an increasing need to introduce computing and programming education at an early age, starting at elementary-level grades. However, given the conceptual and open-ended nature of programming tasks, novice learners often struggle when solving these tasks on their own. Given the scarcity of human tutoring resources to provide individualized assistance, AI-driven educational technology has the potential to provide scalable and automated assistance to struggling learners. In this talk, I will present our research on AI-driven techniques for automatically synthesizing new programming tasks, generating personalized feedback, and modeling learners' knowledge. I will highlight unique challenges and insights in the programming domain, which can also drive the next scientific breakthroughs in AI-driven education for other subject domains. I will conclude with directions for future work on AI-driven educational technology to make programming education effective and accessible for all.

Adish Singla is a faculty member at the Max Planck Institute for Software Systems (MPI-SWS), Germany, where he has been leading the Machine Teaching Group since 2017. He conducts research in the area of Machine Teaching, with a particular focus on open-ended learning and problem-solving domains. In recent years, his research has centered around developing AI-driven educational technology for introductory programming environments. He has received several awards for his research, including an AAAI Outstanding Paper Honorable Mention Award (2022) and an ERC Starting Grant (2021). He also has extensive experience working in the industry and is a recipient of several industry awards, including a research grant from Microsoft Research Ph.D. Scholarship Programme (2018), Facebook Graduate Fellowship (2015), Microsoft Tech Transfer Award (2011), and Microsoft Gold Star Award (2010).