

Designing the Future Engineer: How AI Is Transforming Learning, Work, and Discovery

John Kitchin

Carnegie Mellon University, Department of Chemical Engineering

ABSTRACT

Artificial intelligence is reshaping what it means to be an engineer and it is changing how we learn, design, and discover. This talk explores the convergence of generative AI, data-driven modeling, and autonomous experimentation, and what that means for engineering education and workforce development. From intelligent tutors and code-generation assistants to self-driving laboratories and agentic research systems, AI is expanding both the cognitive and creative boundaries of the profession. Drawing on examples from open-source educational ecosystems such as pycse, and recent research on agentic science and generative optimization, we will discuss how future engineers can be trained not only to use AI tools, but

to think with them, integrating computation, ethics, and domain expertise into continuous, collaborative learning. We will also discuss challenges of buy-in, resources, resistance from both faculty and students, and the need to maintain a balance of traditional learning approaches with the new opportunities AI offers.

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