

# SOFTWARE ENGINEERING FOR AI-ENABLED SYSTEMS

17 - 445 / 645 · SUMMER + FALL 2020

## COURSE DESCRIPTION

The course takes a software engineering perspective on building software systems with a significant machine learning or AI component. It discusses how to take an idea and a model developed by a data scientist (e.g., scripts and Jupyter notebook) and deploy it as part of scalable and maintainable system (e.g., mobile apps, web applications, IoT devices). Rather than focusing on modeling and learning itself, this course assumes a working relationship with a data scientist and focuses on issues of design, implementation, operation, and assurance and how those interact with the data scientist's modeling.

This course is aimed at software engineers who want to understand the specific challenges of working with AI components and at data scientists who want to understand the challenges of getting a prototype model into production; it facilitates communication and collaboration between both roles.

## WHAT QUESTIONS WILL THIS COURSE ADDRESS?

- How can correctness or usefulness of a system with an AI component be specified or evaluated? How does requirements engineering change for AI-enabled systems?
- How to analyze and mitigate wrong results and how to design robust systems? Is modular design still possible with AI components?
- How and where to deploy models, how and when to update models, and what telemetry to collect? How to design learning and evaluation infrastructure that scales?
- How to compose multiple AI components within a system and detect feedback loops? What does software architecture for AI-enabled systems look like?
- How to detect poor data quality, poor model quality, and data drift? What would unit testing for data look like?
- How to assure quality of an AI-enabled system? How would test automation look like to test correctness of infrastructure or models?
- How to assure fairness and privacy of AI-enabled systems?

## LOGISTICS

*This course will be offered during both the Summer and Fall 2020 semesters.*

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*Open to undergraduate and master students meeting the prerequisites.*

VISIT THE COURSE WEBSITE TO LEARN MORE:  
**CKAESTNE.GITHUB.IO/SEAI/**