

MLOps

Department of Computer Engineering, Faculty
of Engineering

King Mongkut's University of Technology
Thonburi



Instructors

Asst. Prof. Dr. Santitham Prom-on



santitham.pro@kmutt.ac.th

Dr. Aye Hninn Khine



aye.hnin@kmutt.ac.th



Teaching Assistant

- Kaung Htet Lin (Master Student CPE)

Resources

Courses

- Full Stack Deep Learning - <https://fullstackdeeplearning.com/course/2022/>
- Machine Learning System Design - <https://stanford-cs329s.github.io/>
- MLOps Zoomcamp - <https://github.com/DataTalksClub/mlops-zoomcamp>

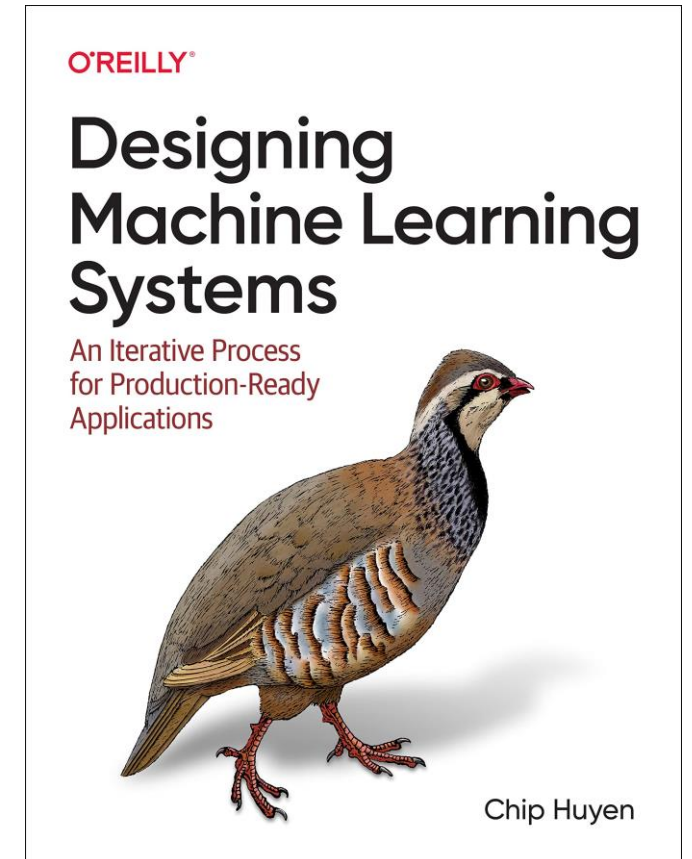
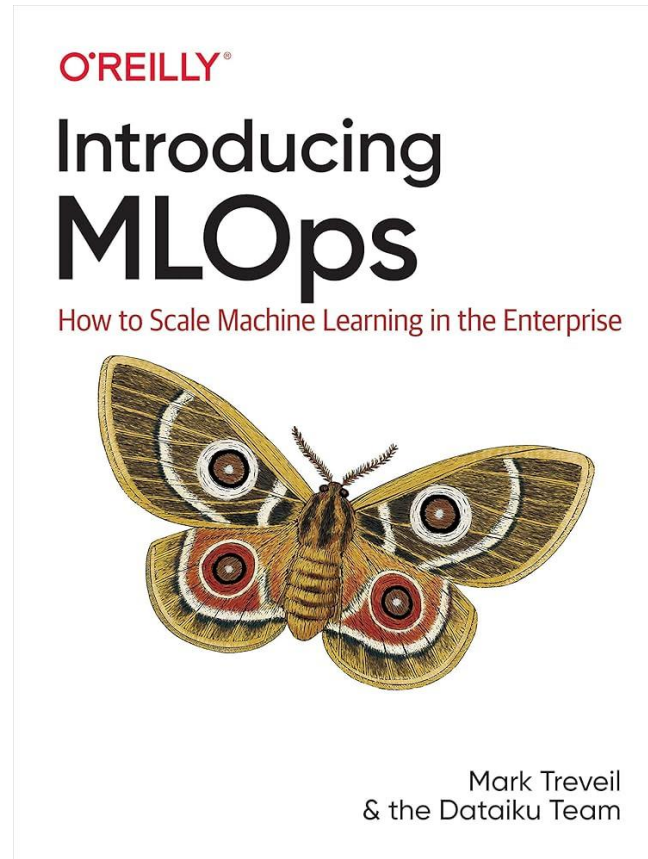
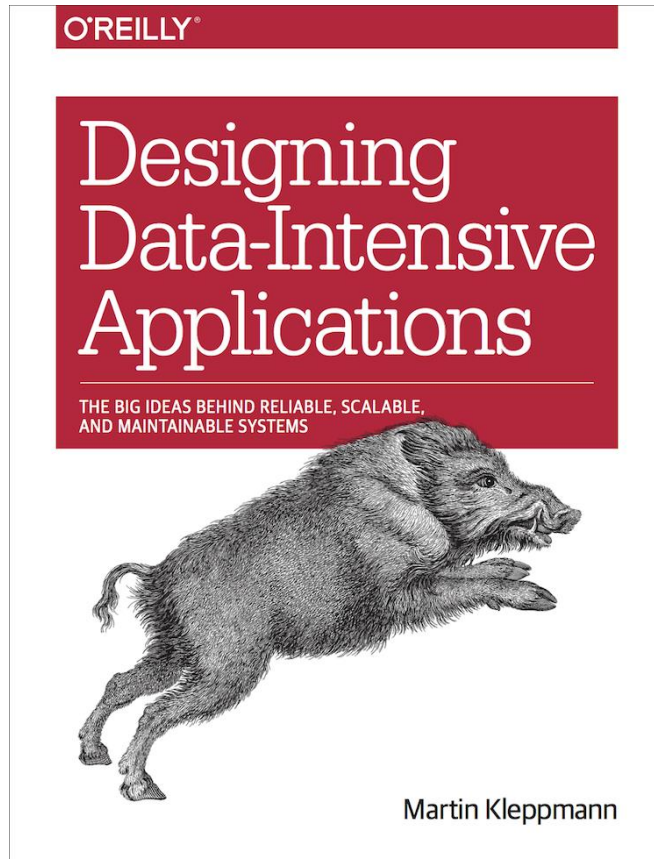
Books

- Designing Machine Learning System – Chip Huyen
- Introducing MLOps - Mark Treveil
- Designing Data Intensive Applications – Martin Kleppmann

Paper

- Machine Learning Operations (MLOps): Overview, Definition, and Architecture
<https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=10081336>

Reference Books



Pre-requisites (Recommended)

- Basic computer science/engineering principles – Programming language, database system, algorithms and data structures
- Basic to intermediate machine learning theories and concepts
- Familiarity with deep learning frameworks such as Tensorflow, Pytorch
- Linear Algebra
- Calculus



Learning Objectives

- To be able to apply ML algorithms to solve real-world problems
- To be able to use existing ML infrastructure, tools, and techniques for deployment
- To be able to develop end-to-end machine learning pipeline
- Elevate career in AI with cutting-edge training



Learning Outcomes

- Understand full life cycle of ML project development
- Understand different roles in end-to-end MLOps architecture
- Develop an end-to-end ML project



Syllabus

- ML Basic Recap
- Intro to MLOps (ML Project Life Cycle)
- Docker fundamentals
- Introduction to Version Control and Gits
- Data management and dataset curation
- Building data pipeline (ETL)
- Feature engineering
- Model Selection and Development
- Experiment tracking
- Model deployment
- Model Serving and API Integration
- Model Monitoring and Management
- Continuous Integration and Continuous Deployment (CI/CD)

Tools

- **Development Environment:** Jupyter Notebook
- **Cloud:** GCP/AWS
- **Experiment tracking tools:** MLFlow
- **Workflow orchestration:** Apache Airflow
- **Monitoring:** Evidently
- **CI/CD:** Github actions, Gitlab CI/CD
- **Infrastructure as code (IaC):** Terraform

Schedule

- Every Thursday (1:30-4:30 PM)
- 3-hour per week (2-hour teaching + 1 hour lab)
- lectures – 13 weeks



Assessment

- Theoretical Exam – 20%
- Assignment – 20 %
- Peer-review report – 20%
- Project – 40%

MLOps Course

- What does not this course cover?
 - Details of ML algorithms (CPE 232)
 - Theories behind each ML algorithm
 - ML model training
- What does this course cover?
 - Best practices and frameworks for delivering ML applications in the real world
 - Experiment tracking
 - Data Drift
 - Deployment
 - Learning things that help you with job interviews for ML engineering roles



Questions?
