

FIRE: THE FIRST-YEAR INNOVATION & RESEARCH EXPERIENCE

What is Machine Learning?



Using statistical and algorithmic techniques to give computer systems the ability to "learn" from data, without being explicitly programmed.

How is it related to AI?



Machine Learning is a subfield of AI that involves the use of statistical & algorithmic techniques such as neural networks and deep learning.

How can it be used?



Open-Source Packages Large Datasets Cloud Platforms

Python Programming Deep Learning Models Neural Networks

What will you be doing?

Data Preprocessing

- Gathering raw data
- Restructuring the data
- Correcting data errors
- Transforming the data
- Augmenting the data
- Sampling the data



Optimization & Application

- Refining the design of your model Improving the performance of
- your model
- Applying your model to the realworld



Contact: Dr. Raymond H. Tu Email: hh2@umd.edu Website: fire.umd.edu/coml



How is it done?







Training & Validation

- Evaluating existing models
- Composing the model
- Run training & validation
- Analyzing training results
- Evaluating with a test set







Why it matters?

- Recent growths in big data, computational \checkmark tools, and state-of-the-art research.
- Machine learning applies to a wide variety of fields.
- ✓ Outcomes can lead to broad impact.
- Great career opportunities. \checkmark

What will you learn?

- Analyze state-of-the-art techniques from recent scholarly papers and open-source repositories.
- Collaborate with a research team to \checkmark analyze, design, implement, and apply a machine learning model for potential real-world usage.
- Perform data preprocessing, training, \checkmark optimization, and evaluation of machine learning models using deep learning frameworks (such as Keras, Tensorflow, and PyTorch).