Workshop Outline

In this workshop, we will rigorously apply data science and machine learning techniques to real-world data to solve real-world problems. We will briefly study the underlying major principles of diverse machine learning approaches to help retain the strategies such as anomaly detection, ensemble learning, deep learning with a neural network, etc.
Main tools of the course will be the Python-based Anaconda Jupyter data science platforms. Datasets will be used from online resources such as Kaggle, UCI KDD, open source repositories, etc. Every session we will use a proper Jupyter notebook to present, demonstrate and practice machine learning pipelines.

Workshop Details

We will cover four Jupyter notebooks every workshop day. In the first hour, the Instructor will go over the module, highlighting important points and talking about the theory and the implementation. In the second hour, the Instructor and co-Instructor will create 4 Zoom virtual discussion rooms and focus on individual Q&A or assistance covering 4 virtual rooms fairly.

Students will copy and paste provided modules Jupyter code cells to their individual notebooks. In the first hour, the Instructor will go over this general approach to the workshop.

Students will work on a new assignment every week and receive grading feedback. The assignment will be submitted in ipynb Jupyter notebook format.

Workshop Schedule

Day 1	Hours	Module Title
Thurs 08/06/20	08:30 – 09:15	Application of Machine Learning in Computer Vision
	09:15 – 10:00	Practice, Q&A /w Instructor, break-out rooms
15 min break		
	10:15 – 11:00	Data Features, Online resources
	11:00 – 11:45	Practice, Q&A /w Instructor, break-out rooms
Lunch break		
	13:00 – 13:45	Preprocessing Datasets for Machine Learning
	13:45 – 14:30	Practice, Q&A /w Instructor, break-out rooms
15 min break		
	14:45 – 15:30	Model Evaluation
	15:30 – 16:15	Practice, Q&A /w Instructor, break-out rooms
	16:15 – 16:30	Final thoughts, discussion, summary, and evaluation
	16:30	Finish daily session

Day 2	Hours	Module Title
Thurs 08/13/20	08:30 – 09:15	Supervised Learning
	09:15 – 10:00	Practice, Q&A /w Instructor, break-out rooms
15 min break		
	10:15 – 11:00	Ensemble Learning
	11:00 – 11:45	Practice, Q&A /w Instructor, break-out rooms
Lunch break		
	13:00 – 13:45	Regression
	13:45 – 14:30	Practice, Q&A /w Instructor, break-out rooms
15 min break		
	14:45 – 15:30	Unsupervised Learning
	15:30 – 16:15	Practice, Q&A /w Instructor, break-out rooms
	16:15 – 16:30	Final thoughts, discussion, summary, and evaluation
	16:30	Finish daily session

Day 3	Hours	Module Title
Thurs 08/20/20	08:30 – 09:15	Multilayer Artificial Neural Networks
	09:15 – 10:00	Practice, Q&A /w Instructor, break-out rooms
15 min break		
	10:15 – 11:00	Model Regularization
	11:00 – 11:45	Practice, Q&A /w Instructor, break-out rooms
Lunch break		
	13:00 – 13:45	Introduction to PyTorch
	13:45 – 14:30	Practice, Q&A /w Instructor, break-out rooms
15 min break		
	14:45 – 15:30	Introduction to TensorFlow
	15:30 – 16:15	Practice, Q&A /w Instructor, break-out rooms
	16:15 – 16:30	Final thoughts, discussion, summary, and evaluation
	16:30	Finish daily session