Artificial Intelligence

Course Information

Dr. Mürsel Taşgın

About me

Mürsel Taşgın - *Computer Scientist, Ph.D.*

Education
2019 - Ph.D. Boğaziçi University Computer Engineering
2006 - MSc. Boğaziçi University Computer Engineering
2002 - BSc. METU Computer Engineering

Industry experience
2013 - Current - KKB Kredi Kayıt Bürosu - Senior Engineering Manager of AI & Systems
2012 - 2013 - Turkcell - Senior System Engineer
2002 - 2012 - Akbank - System Engineer

Research areas
Machine learning, Graph machine learning, complex systems, time-series analysis, anomaly detection, fraud-detection, clustering, unsupervised learning, GNN, Graph mining

https://scholar.google.com/citations?user=Cdvw9fcAAAAJ&hl=tr

https://www.linkedin.com/in/murseltasgin

About the course

- General overview of topics in artificial intelligence and machine learning
- Detailed analysis on some topics
- Homeworks, project assignments
- Programming exercises (Python required)
- Attendance required

Resources:

- Artificial Intelligence: A modern Approach (Russell and Norvig)
- Machine Learning - Andrew Ng
- Mathematics for Machine Learning (https://mml-book.github.io/)
- .....

About the course

Course period/hours:

8th Feb 2022 - 7th April 2022 (10 weeks)

Tuesday 15:00 - 18:00

Thursday 15:00 - 18:00

Plan (*subject to change*)

	Hours			*Hours*
1- Introduction	4		**5- Neural Networks**	8
History of AI	*1*		Feed forward networks	*2*
Pre-requisites for AI	*1*		Recurrent networks	*2*
Systems and intelligent agents	*2*		Deep learning	*2*
2- Problem Solving, Search	6		Sequence models	*2*
Search	*2*		**6- Language**	8
Game Playing	*2*		NLP basics	*2*
Constraint satisfaction problems	*2*		Word vectors, sequences	*2*
3- Optimization	8		Transformer models	*4*
Local search	*2*		**7- Graph Machine Learning**	6
Hill climbing, simulated annealing	*2*		Graph neural networks	*4*
Linear programming	*2*		Application areas	*2*
Inference	*2*		**8- AI Application Areas, Issues, Concerns**	*1*
4- Machine Learning	10			
Regression	*2*		**Issues and Concerns**	
Classification	*2*		Ethical Concerns	
Clustering	*2*		Bias and Trust	
Support Vector Machines	*2*		Technical Issues	
Tree-based algorithms	*2*		**Knowledge, reasoning, planning**	

Tools, libraries

- Python
- Jupyter notebook, Jupyter Lab
- Tensorflow, PyTorch, Keras, scikit-learn, pandas, numpy, ...
- Google Colab: https://colab.research.google.com/
- GitHub - github.com
- Kaggle - kaggle.com & Kaggle datasets
- Google dataset search

Books, materials, links

- Artificial Intelligence: A modern Approach (Russell and Norvig)
- Mathematics for machine learning (https://mml-book.github.io/)
- https://deepmind.com/learning-resources/deep-learning-lecture-series-2020
- https://paperswithcode.com/
- Crash Course AI - https://www.youtube.com/playlist?list=PL8dPuuaLjXtO65LeD2p4_Sb5XQ51par_b
- David MacKay - Video Lectures - http://videolectures.net/david_mackay/
- Deep Learning Book - Ian Goodfellow - https://www.deeplearningbook.org/
- Advanced Deep Learning and Reinforcement Learning - https://www.youtube.com/playlist?list=PLqYmG7hTraZDNJre23vqCGIVpfZ_K2RZs
- Full Stack Deep Learning Course - https://fullstackdeeplearning.com/

Nice to have’s

- Datascience practices
- ML model building and deployment
- Knowledge of some of the data tools, platforms (Kafka, HDFS, Airflow, etc.)
- SQL
- MySQL
- ETL
- Cloud platforms (AWS, Azure, GCP, etc.)
- Data manipulation & visualization tools (Datalku, etc.)