Ort Braude College of Engineering

61994 - Deep Learning for Computer Vision

Course Hours: 3 hours: 2 hours lecture, 1-hour lab

Course credits: 2.5

Pre courses: 61751 ,61761

Course goals

This course introduces the domain of Deep Learning, concepts and algorithms of this branch of Artificial Intelligence, implemented using neural networks.
The labs of this course will be performed using the most up to date development tools of this field.

Topics

1. Computer vision overview
2. Python/numpy tutorial
3. Image classification
4. Convolutional Neural Networks
5. Training Neural Networks
6. Deep Learning Hardware and Software
7. CNN Architectures (AlexNet, VGG, GoogLeNet, ResNet)
8. Recurrent Neural Networks
9. Practical Object Detection and Segmentation
10. Visualizing and Understanding
11. Video understanding

Literature

1. Deep Learning: A Practitioner's Approach by Josh Patterson and Adam Gibson. ISBN-13: 978-1491914250
2. Deep Learning with Python by Francois Chollet, ISBN-13: 978-1617294433

Course requirements and grading

Attendance: Mandatory
Labs, submissions: 50%
Project: 50%

Course Artifacts

Upon successful completion of this course, students will be able to:

1. Implement Deep Learning techniques for a given learning task
2. Use modern state of the art tools for Deep Learning
3. Train Neural Networks to classify images
4. Analyze existing CNN architectures
5. Train Neural Networks to successfully segment images