6.S191: Intro to Deep Learning

Course Description:
A week-long intro to deep learning methods with applications to machine translation, image recognition, game playing, image generation and more. A collaborative course incorporating labs in TensorFlow and peer brainstorming along with lectures. Course concludes with project proposals with feedback from staff and panel of industry sponsors.

The Team:

Nick Locascio, Lead Organizer	Harini Suresh, Lead Organizer
Ishaan Gulrajani, Co-Chair	Victoria Dean, Co-Chair
Lex Fridman, Co-Chair	Yo Shavit, Co-Chair
Ruth Park, Director of Marketing	Anish Athalye, TA
Eduardo De Leon, TA	Jackie Xu, TA

Course schedule:
Jan 30th - Feb3rd. 5 Meetings. 3 hours each. 3 unit class.
10:30am-12:00pm: Lecture
12pm-12:30pm: Peer Brainstorming + Lunch
12:30pm-1:30pm: Lab

1. **Course Intro + Deep Learning for NLP**
   a. **Lecture Part 1:** Cover the Syllabus, State of Deep Learning in 2017
   b. **Lecture Part 2:** RNN, LSTM, Word2Vec, Neural Machine Translation
   c. **Peer Brainstorming**
   d. **Lab:** Intro to TensorFlow I: Language Modeling with LSTMs
2. **Deep Learning for Computer Vision**
   a. **Lecture Part 1:** CNNs for Classification
   b. **Lecture Part 2:** Autoencoders, VAE, GAN, InfoGAN
   c. **Peer Brainstorming**
   d. **Lab:** Intro to TensorFlow II: Image Classification with CNNs
3. **Multimodal Problems / Reinforcement Learning**
   a. **Lecture Part 1:** Image Captioning, VQA
   b. **Lecture Part 2:** Atari DQN, Learning Hand-Eye Coordination
   c. **Peer Brainstorming**
   d. **Lab:** Work time for paper reviews/project proposals
4. **Deep Learning Applications In Industry**
   a. **Lecture Part 1:** Guest Speaker TBD
   b. **Lecture Part 2:** Guest Speaker TBD
   c. **Peer Brainstorming**
   d. **Lab:** Work time for paper reviews/project proposals

5. **Paper Review Slideshow / Project Proposal Presentations**

Assignment: 1 Paper Review / Project Proposal Presentation

Students will be asked either to compose a paper review or present a novel deep learning research project proposal. Project proposals will be presented on the last day of class.