# Research areas

- Restricted Boltzmann Machines and Autoencoders (Unsupervised)
- Convolutional Neural Networks and Recurrent Neural Networks (Supervised)
- Deep (Feed Forward) Neural Networks (Supervised)
- Neural Turing Machines and Memory Networks (Supervised)
- Deep Q-Networks (Reinforcement Learning)
- Sequence to Sequence: Attention Mechanisms, Neural Machine Translations and Neural Conversational Models (Supervised)
- Generative Adversarial Networks (Unsupervised)

**Conferences**

- NIPS, ICML, ICLR, CVPR, ICCV, ECCV, ACL

# Seminars

- Neural Language Modeling and Word Embedding
- Neural Machine Translations and Conversation Modeling
- Sequence-to-Sequence Models and Attention Mechanisms
- Neural Turin Machines and Memory Networks
- Speech Recognition with Deep Architectures
- Visual and Text-based Question-Answering
- Deep Reinforcement Learning and Robotics
- Image and Video Captioning Generation
- Representation Learning and Reasoning
- Medical Image and Diagnosis
- Drug Discovery and Genomics
- Drug Discovery and Genomics
- Finance and fraud detection
- Visual Turin Test

- **Popular CNN models**
  - AlexNet
  - VGG
  - GoogleNet
  - ResNet
  - Region Based CNNs
  - Generative Adversarial Networks
  - Generating Image Descriptions
  - Spatial Transformer Networks
  - ...
  - https://adeshpande3.github.io/adeshpande3.github.io/The-9-Deep-Learning-Papers-You-Need-To-Know-About.html

- **Specifications**:
  - Individual
  - 20 min (15 min + 5 questions)

# Previous projects

- Activation Functions for Deep Learning: A Comparative Study using Statistical Tests
- Reconhecimento de autores e fraudes em manuscritos utilizando Deep Learning
- Análise para Seleção de Gradientes e o Processo de “Desaprendizagem para Aprender”
- The Impact of Datasets Complexity and Diversity on Transfer Learning over Convolutional Neural Networks
- Breaking Hash Passwords using Deep Learning
- Exploring CNNs for Reduced Manually Fed Training Datasets for Text Based CAPTCHA Recognition
- Uso de diferentes modelos de cores em redes neurais convolucionais para detecção de bordas
- RNN-LSTM para Previsão de Séries Temporais
- Report of project in deep learning: 2DPCANet
- Detecção de anomalias baseada em autoencoders convolucionais

# Project proposal

- Two Students
- Deadline: 22/09/2017
- 1 page proposal considering:

- What is the problem that you will be investigating? Why is it interesting?
- What data will you use? If you are collecting new datasets, how do you plan to collect them?
- What method or algorithm are you proposing? If there are existing implementations, will you use them and how? How do you plan to improve or modify such implementations?
- What reading will you examine to provide context and background?
- How will you evaluate your results? Qualitatively, what kind of results do you expect (e.g. plots or figures)? Quantitatively, what kind of analysis will you use to evaluate and/or compare your results (e.g. what performance metrics or statistical tests)?