Robot Learning

- ◔ **Deep Reinforcement Learning**
  - ✓ CS231n
  - ◕ David Silver's lecture

    Teaching - David Silver

    https://www.davidsilver.uk/teaching/
  - ◔ DL Book

    GitHub - MingchaoZhu/DeepLearnin...

    https://github.com/MingchaoZhu/DeepLearning
  - ◔ RL Book

    http://incompleteideas.net/book/the-...

    http://incompleteideas.net/book/the-book-2nd.html
- ◔ **Imitation Learning**

  Learning to Imitate | SAIL Blog
- ◑ **Robot Learning Related Papers & Implementation**

  You awesome title | Write an awesom...
  - ◑ tensorflow

    A deeplearning framework developed by Google (as opposed to pyTorch from Facebook), which is used by most of deep learning algorithms from Google researchers.
    So, it is necessary to familarize myself with modules and functions that are commonly used in deep learning models.
  - ◕ vision language model

    CLIP: Connecting text and images

    Especially large models, are powerful to help robots understand instructions or feedbacks from the environment.
    (e.g. OpenAI's CLIP: Contrastive Language-Image Pre-training)
  - ✓ tokenization/token compress technique

    Compress tokens so as to enble real-time inference even though the backbone is a high capacity Transformer.

- ✓ language conditioned architecture

  Fusion of multimodal inputs (Image and Language), I need to understand how such a conditioning layer works (e.g., AAAI 18-FiLM: Visual Reasoning with a General Conditional Layer)
  Note: FiLM can be viewed as using one network to generate parameters of another network

- ◕ basic policy training pipeline

  Common practice to map from state to action (as opposed to Robotics Transformers, which do not rely on such kind of manipulation policies)

- ◔ exprimental details and interweaving of SayCan, RT-1 and RT-2

  When look into the experimental details of these papers, I found they are interweaving and it takes some time to figure out and understand the underlying reasons for model selection and experimental design.

  Good feature: each self-produced module is paired with a file for Unit Test (useful for debugging, testing and maintaining)

  Opportunity: mutimodal data fusion happens in the embedding space. Simple, but may shrink the subtle useful information from inputs. How about different ways of multimodal data fusion?