

Pre-Meeting - Thursday, June 20th at 1PM

Peyman Bateni

July 18, 2019

1 Goals and Overview

- Updates on the past month
- Exploring current focus (architectural designs, approaches, etc.)
- This document is 3 pages long, with an estimate of 3 hours to cover so we need to fly through it to cover the important bits.

2 Admin (ETC: 30 minutes):

2.1 Personal - Skip if time is limited (which likely is the case)

- As of 10 days ago, I can legally drink in the states (which I personally feel somewhat indifferent about)
- Over the time you were gone, I had to deal with a root infection, a sprained ankle and a virus two weeks later (and lost probably about 4 days either in pain or on medication recovering) - this is quite ironic relative to the fact that over the course of my undergrad I never got sick.

2.2 Inverted AI - Skip if we're scheduling a follow-up meeting.

- I've used my association with Next to pull \$10k AWS credits (+ another \$5k in AWS business support) into the Inverted AI AWS account which should prove useful specially in the future.
- Professor Ajay Agrawal, who is the Founder of CDL and was one of my mentors at Next, has internally recommended us to CDL-West (General Stream) and CDL-Toronto (AI Stream), resulting in the subsequent meeting with Tonner Jackson and Adam Day. We're preparing an application for early submission and review by tomorrow (Friday 19th) with Adam.
- I've had a run of funding conversations, results of which were posted in the slack chat on business ideas. My talks with Gail Murphy, Ian Beg, Sherry Zhao, and Riya Gangully in convincing UBC to open up industry contacts for exploring funding options was rendered unsuccessful as UBC's policy 88, which defines a conflict interest in helping out startups that are separate legal entities.
- While there are some small opportunities in DARPA project funding, and other programs (specially in Canada), given the scope of Inverted AI, raising a seed round is likely to be the necessary step to secure the funding needed.
- **Let's set up a separate time to sit down with Adam and discuss possibilities regarding my (in addition to research) business related involvement in Inverted AI.**

2.3 Bibtex, Internships, Funding, Etc.

- I need access to the bibtex files you want me to check, edit and package as a github module for use. I had some talks with Boyan regarding extending it further using some citations management software such as Zotero or Mendeley to aggregate all papers and submissions but that's more in the future.
- Leonid was very kind in supporting my bid for joining Borealis AI earlier. That said, I read your manifesto and had some personal reflection as to goals and plans for the next two years, and called it off. We'll need much to talk about regarding alignment of goals, but I think a solution involving Inverted AI may have the perfect answer to it.
- Leonid is offering an Amazon Go Graduate Fellowship Funding, **the deadline for which is tomorrow..** Each fellowship has \$26k in direct funding and \$4k in travel stipends. The guidelines are relatively vague but it requires academic excellence (✓), research history (relatively ok ✓), relevance of project (where LwLL gives me the biggest edge over others), and: "You should be, at least in principle, interested in doing an internship at Amazon Go (Seattle)." Now this last one is something that I'd consider a mediocre plan B at best given some of the plans I have for Inverted AI. **That said, it would be great if I could have your full support to locking down this fellowship.**
- Due to a mix-up of deadlines, I had to submit my TA-ship application since you were gone. Hopefully, we can sort out my personal funding plans with respect to Inverted AI (or RAship should the conversation go the other way) soon as I can turn TAship offer (checked with Joyce).

2.4 My WACV Visual Sentiment Analysis Paper

- I've had a weird few almost saying screw it moments, but since I've done 90% of the work already, I decided to follow-through with it. This has been the subject of my focus since Tuesday and will probably be complete by the end of this weekend.
- I need to run some additional experiments and fix up some parts of the original write-up.

3 Research (ETC: 2.5+ hours)

3.1 Problem Description and Dataset Description

- Some updates to the problem description (changes are in bold which primarily suggests that DARPA is not looking for few-shot learning but rather semi-supervised/active learning). I've also added a DARPA-proposal specific on the dataset description, and the evaluation metrics used.
- Both files are on my github.

3.2 Our Initial Generative Top Down Model

- Before you left, we formulate a generative deep learning top-down model 1. After rather lengthy discussions on solving the symmetry problem in VRNNs and the fact that initial model seems to have intractable pieces (which make inference problematic), I have temporarily abandoned it.
- I've since continued with literature review, reading more papers and developed four potential approaches which I pitched to Leonid when he came back about two weeks ago.

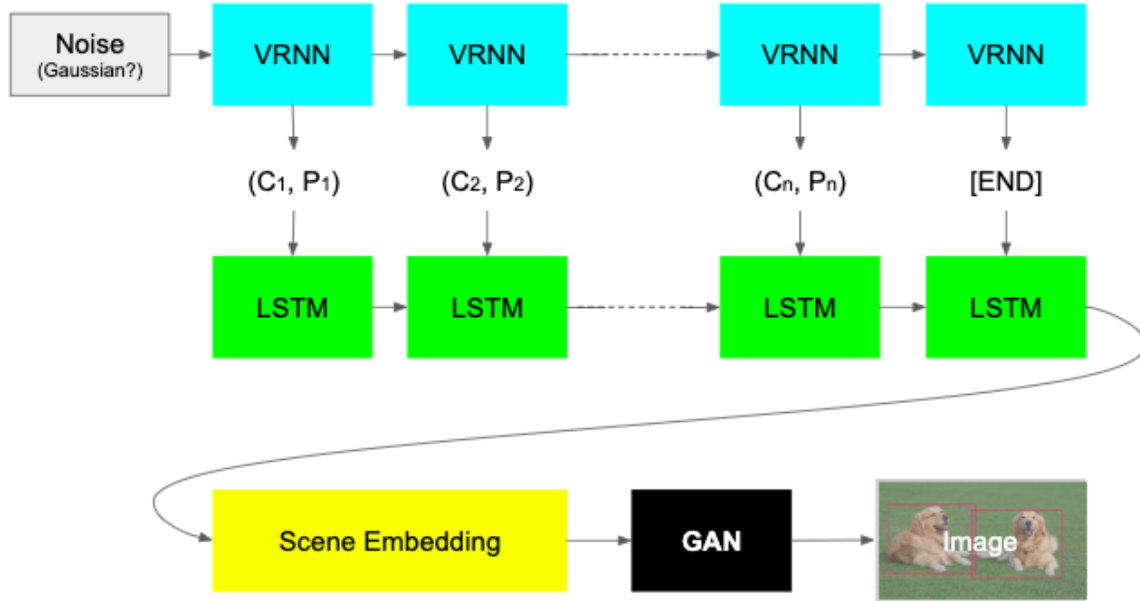


Figure 1: Generative Top Down Model for Few-Shot Visual Detection

3.3 Current Work

- Since the needed diagrams will take too long, I'd much rather take over the white board in explaining this section. The white-board discussion made my meetings with Leonid more effective this way.
- **Works to Cover:**
 - Hierarchical Meta-Learning using Meta-Parameter Trees → early small scale experiments show root selection to account for over 50% of class subsets. Gains are incremental.
 - Hierarchical Meta-Learning (new variations):
 - * Final block modifications, classifier weight transfers
 - * One vs. all classification
 - * Hierarchical Top-Down Recursive Classification at each level
 - Semi-Supervised VAEs for single object localization
 - Semi-Supervised AIR for multi-object detection
 - END-CRAZY Hierarchical Meta-Learning → learn the hierarchy using hierarchical nonparametric Bayes instead of using cross-modal hierarchy priors