SANYAM AGARWAL

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EDUCATION

Indian Institute of Technology (IIT) Kharagpur, India July 2012 - May 2016
Bachelor of Technology (Honours) Computer Science and Engineering -- CGPA: 9.0/10
- Bachelor's thesis: From a corpus of research papers, automatically extract trends like popular research areas and tools/techniques used over time. Awarded top grade. Published at JCDL 2017 (see Publications).

EXPERIENCE

Georgia Institute of Technology, *Visiting Research Scholar*, Atlanta, GA, USA Sept. 2018 - Current
- Advised by Prof. Dhruv Batra and Prof. Devi Parikh. Performing research in computer vision, and natural language processing.
- Worked on generating natural language navigation instructions for trajectories in Matterport3D (a photo-realistic 3D environment). Developed a **hard-attention** model, trained via **gumbel-softmax straight through estimator**. Published at CVPR 2019 (see Publications).
- Now fine-tuning instruction generation using **reinforcement learning** methods such as **self-critical sequence training** and **actor-critic**.

Indian Institute of Science, *Research Intern*, Bengaluru, India Nov. 2017 - July 2018
Advised by Prof. Ambedkar Dukkipati. Developed a **decoder-less** variant of Skip-Thought Vectors (maps natural language sentences to vectors) which trained **10 times faster**. Worked on generative adversarial networks (GANs) for **semi-supervised learning**. Developed models that explicitly learned to generate **functions** which in turn access a knowledge base (KB) for answering questions.

Software Robotics Corporation (Soroco), *Platform Engineer*, Bengaluru, India June 2016 - Oct. 2017
- Led a team which used recurrent neural networks (RNNs) to automatically find easy-to-automate business processes (for e.g. payroll management, settling vendor disputes for top e-commerce websites).
- Designed and implemented a patent-pending **work queue**-based distributed systems framework operational at Fortune 500 companies. The framework allowed developing efficient and fault-tolerant automation systems with minimal internal state.

Facebook, *Software Engineering Intern*, Menlo Park, CA, USA May 2015 - July 2015
Worked with the configuration management team in the Core Engineering Group. Found and fixed bottlenecks in existing architecture. Parallelized configuration checking service by splitting into master and slaves, speeding it up by **1000** times.

PROJECTS

Fast GPU-Based Simulator for Room-to-Room dataset Jan. 2019
Optimized the Room-to-Room dataset's original simulator to only use GPU for updating simulator's state corresponding to the actions taken by the agent. The optimized simulator has **17x** faster environment traversal on just a **single** GPU!

ICLR 2018 reproducibility challenge: Interpretable Counting for Visual Question Answering June 2018
[Code] Model for answering counting based questions in VQA dataset trained with Self-Critical Sequence Training (a reinforcement learning method). Counting objects in images modeled as a sequential decision process.

The first public PyTorch implementations of:-
- Skip-Thought Vectors [Code] / [Blog] : Model for understanding natural language
- Attentive Recurrent Comparators [Code] / [Blog] : Model for one-shot learning of new hand-drawn characters

Robot Soccer, IIT Kharagpur May 2013 - May 2016
- Led the A.I. team. Created a framework for learning robot control policies for playing soccer using Q-Learning.
- **Bronze medal** in FIRA 2015, South Korea.

PUBLICATIONS

Visual Landmark Selection for Generating Grounded and Interpretable Navigation Instructions June 2019
S. Agarwal, D. Parikh, D. Batra, P. Anderson, S. Lee
[PDF] CVPR'19 Workshop on Deep Learning for Semantic Visual Navigation

AppTechMiner: Mining Applications and Techniques from Scientific Articles, June 2017
M. Singh, S. Dan, S. Agarwal, P. Goyal, A. Mukherjee
[PDF] Joint Conference on Digital Libraries (JCDL) 2017:6th International Workshop On Mining Scientific Publications