ANIKET DIDOLKAR

Website ◇ **GitHub** ◇ **Google Scholar** ◇ **adidolkar123@gmail.com**

EDUCATION

- **University of Montreal** *August 2021 - August 2023*
  Master of Science in Computer Science
  DIRO CGPA: -
  - Supervised by Professor Yoshua Bengio and Professor Michael Mozer.
- **Manipal Institute of Technology, Manipal** *August 2016 - June 2020*
  Bachelor of Technology
  Department of Computer Science and Engineering CGPA: 9.19/10.0
  - Awarded a gold medal from the director for excellent academic performance in the 3rd semester.

WORK EXPERIENCE

- **MILA - Quebec AI Institute, Montreal** Aug 2021-Present
  Graduate Student Researcher *Advisors - Yoshua Bengio and Michael Mozer*
  - Working on deep learning research with a focus building better models for out-of-distribution generalization.
- **MILA - Quebec AI Institute, Montreal** Aug 2020-Aug 2021
  Research Intern *Advisors - Anirudh Goyal and Yoshua Bengio*
  - Worked on designing better communication/interaction frameworks for modular deep learning models.
- **Indian Institute of Science, Bangalore** Jan 2020 - July 2020
  Research Intern *Advisors - Aditya Gopalan and Himanshu Tyagi*
  - Built a data analytics and visualization platform from scratch for monitoring and analyzing the pollution levels in the city of Bangalore, India.
  - Implemented various regressive prediction algorithms using machine learning as a part of the platform to predict the concentration of hazardous pollutants in the atmosphere.
- **Google Summer of Code [Final Report] [Evaluation Comments]** May 2019 - August 2019
  Student Developer
  - Built support for various recurrent neural networks*(LSTM, GRU, Vanilla RNN)* in C++ for **ChainerX**. Utilized CUDA and CUDNN for the corresponding GPU-compatible implementations of these models.
- **MIDAS Lab, IIIT Delhi** April 2019 - Present
  Research Intern *Advisor - Rajiv Ratn Shah*
  - Designed a method for profiling hate-speech on Twitter by utilizing information about the community to which a user belonged on Twitter along with the text of the tweet.
  - Introduced a novel data augmentation technique for NLP and Speech in which new training examples can be created on the fly by interpolating pre-existing examples in the feature space.
- **Ubisoft** May 2019 - July 2019
  Automation Intern
  - Created a novel algorithm for detecting *UI bugs* in video games using deep learning techniques like semantic segmentation and depth estimation which achieved an accuracy of 85% and eliminated the need for manual detection of bugs.
- **Project Manas(AI/Robotics team at Manipal Insititue of Technology)** Feb 2018 - Feb 2019
  AI Researcher
  - Implemented deep reinforcement learning algorithms such as *DQN, PPO, and A3C* on small scale robotic agents and various games.
- **Symbl.ai** June 2018 - July 2018
  Data Science Intern
  - Studied the behavior and performance of various language models such as LSTMs and Transformers for detecting action-items in meeting transcripts.

PUBLICATIONS

- **Neural Production Systems** [pdf]
  Neurips 2021
  Aniket Didolkar*, Anirudh Goyal*, Nan Rosemary Ke, , Charles Blundell, Philippe Beaudoin, Nicolas Heess, Michael Mozer, Yoshua Bengio

- **Systematic Evaluation of Causal Discovery in Visual Model Based RL** [pdf]
  Neurips 2021 : Datasets and Benchmarks Track
  Nan Rosemary Ke, *, **Aniket Didolkar***, Sarthak Mittal, Anirudh Goyal, Guillaume Lajoie, Stefan Bauer, Danilo Rezende, Yoshua Bengio, Michael Mozer, Christopher Pal

- **Coordination Among Neural Modules Through a Shared Global Workspace** [pdf]
  Preprint
  Anirudh Goyal, **Aniket Didolkar**, Alex Lamb, Kartikeya Badola, Nan Rosemary Ke, Nasim Rahaman, Jonathan Binas, Charles Blundell, Michael Mozer, Yoshua Bengio

- **SpeechMix - Augmenting Deep Sound Recognition using Hidden Space Interpolations** [pdf][code]
  Conference of the International Speech Communication Association ***INTERSPEECH 2020***
  Amit Jindal*, Narayanan Elavathur Ranganatha*, **Aniket Didolkar***, Arijit Ghosh Chowdhury*, Ramit Sawhney, Rajiv Ratn Shah, Di Jin.

- **Augmenting NLP models using Latent Feature Interpolations** [pdf]
  International Conference on Computational Linguistics ***COLING 2020***
  Amit Jindal*, **Aniket Didolkar***, Arijit Ghosh Chowdhury*, Di Jin, Ramit Sawhney, Rajiv Ratn Shah.

- **Beyond Hostile Linguistic Cues: The Gravity of Online Milieu for Hate Speech Detection in Arabic** [pdf]
  Proceedings of the 30th ACM Conference on Hypertext and Social Media ***ACM-HyperText 2019***
  Aniket Didolkar, Arijit Ghosh Chowdhury, Ramit Sawhney, Rajiv Ratn Shah.

- **ARHNet-Leveraging Community Interaction for Detection of Religious Hate Speech in Arabic** [pdf]
  Proceedings of the 57th Conference of the Association for Computational Linguistics: Student Research Workshop ***ACL-SRW 2019***
  Aniket Didolkar, Arijit Ghosh Chowdhury, Ramit Sawhney, Rajiv Ratn Shah.

- **[Re] h-detach: Modifying the LSTM Gradient Towards Better Optimization** [pdf] [code]
  Volume 4 Issue 2 of the ReScience Journal (Paper accepted as part of the **ICLR reproducibility challenge 2019**)
  Aniket Didolkar

PROJECTS

- **Implementation of the paper - Recurrent Independent Mechanisms** [code] **[50+ stars]**
  - Implemented the model presented in the paper - *Recurrent Independent Mechanisms(RIMs)*. Reproduced the results for the MNIST task in the paper. Also implemented proximal policy optimization(PPO) using the proposed model and tested it on the gym-minigrid environment.
  - Successfully demonstrated that RIMs generalize better to distribution shifts than LSTMs.
- **Implemented domain randomization for AI Habitat** [code]
  - Dived into the large AI Habitat codebase to implement domain randomization from scratch so that it could be used to train RL models like PPO.
- **BERT Baselines for COQA** [code]
  - Implemented various language models like BERT, SpanBERT, and DistilBERT for the reading comprehension task from the COQA dataset.
- **Parallel implementation of T-SNE** [code]
  - Leveraged GPU acceleration using CUDA to implement a parallelized version of T-SNE.
- **Pruning Neural Networks** [code]
  - Implemented weight pruning and unit pruning on a simple fully-connected neural network. Showed that up to **90%** of the weights can be pruned without a considerable drop in accuracy. Also utilized the sparsity to speed up inference by upto **30%**.
- **DeepJava** [code]
  - Designed a deep learning library from scratch in Java. It contained a few commonly used operations such as CNNs, MLPs, softmax, sigmoid, relu etc.
  - My library automatically builds a dynamic computation graph of the operations defined by the user and supports automatic differentiation of this computation graph to enable training through backpropagation.

ACHIEVEMENTS

- Awarded a full scholarship to pursue my masters at The University of Montreal.
- Awarded the ACM SIGWEB SIGSTAP Travel Grant to present my paper at ACM Hypertext 2019 at Germany.