Abhinav Moudgil

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Education

Concordia University, Mila - Quebec AI Institute
Ph.D. in Computer Science (GPA 4.22/4.3)
Supported by FRQNT and Federick Lowy Scholars Fellowship
Advised by Eugene Belilovksy
Sep 2021 - Present

International Institute of Information Technology, Hyderabad (IIIT-H)
B.Tech. and MS in Electronics and Communication Engineering (GPA 8.07/10)
MS Thesis: "Extending Visual Object Tracking for Long Time Horizons"
2013 - 2019

Interests

Transformers, learned optimization, self-supervised learning

Experience

Georgia Institute of Technology
Visiting Researcher with Devi Parikh and Dhruv Batra
· Developed scene- and object-aware transformer for vision-and-language navigation (NeurIPS 2021).
· Worked on building robust VQA models with Contrastive Learning (ICCV 2021).
Jan 2020 - Aug 2021

Stanford University
Research Intern with Noah D. Goodman
Extended and reproduced results of the paper "A computational model of linguistic humor in puns" (Kao et al., CogSci 2015) to recognize and rate puns with a novel probabilistic model.
Sep 2018 - Dec 2018

University of California, San Diego
Visiting Scholar with Sicun Gao
Worked on sample efficient Reinforcement Learning algorithms for Atari games by learning shared action embeddings.
May 2018 - Aug 2018

Google Summer of Code, CERN
Student Developer with Sergei Glyezer, Lorenzo Moneta and Omar Zapata
Developed a new pipeline from scratch in C++ for unsupervised feature extraction methods in TMVA, an open source project by CERN SFT.
Apr 2016 - Sep 2016

Publications

Learning Communication-Efficient Optimizers
Under review; Accepted to Federated Learning Workshop at NeurIPS 2023

Learning to Optimize with Recurrent Hierarchical Transformers
Abhinav Moudgil, Boris Knyazev, Guillaume Lajoie, Eugene Belilovsky
New Frontiers in Learning, Control, and Dynamical Systems Workshop, International Conference on Machine Learning (ICML), 2023

Towards Scaling Difference Target Propagation by Learning Backprop Targets
Maxence Ernoult, Fabrice Normandin*, **Abhinav Moudgil***, Sean Spinney, Eugene Belilovsky, Irina Rish, Blake Richards, Yoshua Bengio
International Conference on Machine Learning (ICML), 2022

SOAT: A Scene- and Object-Aware Transformer for Vision-and-Language Navigation
Abhinav Moudgil, Arjun Majumdar, Harsh Agrawal, Stefan Lee, Dhruv Batra
Neural Information Processing Systems (NeurIPS), 2021

Contrast and Classify: Alternate Training for Robust VQA
Yash Kant, **Abhinav Moudgil**, Dhruv Batra, Devi Parikh, Harsh Agrawal
International Conference on Computer Vision (ICCV), 2021

Exploring 3 R's of Long-term Tracking: Re-detection, Recovery and Reliability
Shyamgopal Karthik, **Abhinav Moudgil**, Vineet Gandhi
IEEE Winter Conference on Applications of Computer Vision (WACV), 2020

Long-Term Visual Object Tracking Benchmark
Abhinav Moudgil, Vineet Gandhi
*Asian Conference on Computer Vision (ACCV), 2018, **Oral***

Papers Reproduced	Held et al., Learning to Track at 100 FPS with Deep Regression Networks, *ECCV 2016* `[github.com/amoudgl/pygoturn]`
	Kao et al., A Computational Model of Linguistic Humor in Puns, *CogSci 2016* `[github.com/amoudgl/pun-model]`
	Bolme et al., Visual Object Tracking using Adaptive Correlation Filters, *CVPR 2010* `[github.com/amoudgl/mosse-tracker]`
Service	**Outstanding Reviewer** *ICML 2022*
	Teaching Assistant COMP 691: Deep Learning, Concordia University, *Winter 2022* CSE 471: Statistical Methods in AI, IIIT-H, *Spring 2017* ISC 201: Science I, IIIT-H, *Fall 2015*
Relevant Coursework	Self-supervised Learning (Aaron Courville, Université de Montréal), Neural Scaling Laws and Foundation Models (Irina Rish, Université de Montréal), Machine Learning, Computer Vision, Statistical Methods in AI, Discrete Mathematics, Linear Algebra, Functional Analysis, Probability & Random Processes, Data Structures
References	**Eugene Belilovsky** *Assistant Professor, Concordia University and Associate Academic Member, Mila* `eugene.belilovsky@concordia.ca`
	Devi Parikh *Associate Professor, Georgia Tech and Research Director, Facebook AI Research* `parikh@gatech.edu`