Mojtaba Válipour

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Languages: English (Professional), Persian (Native), French (Familiar)   Last Update: December 11, 2023
Scholar: https://scholar.google.ca/citations?user=h-4duM0AAAAJ&hl=en

Academic Qualifications

University of Waterloo (UW)   **PhD: Computer Science**   September 2019 - 2024
  Supervisor: Ali Ghodsi @ Data Analytics Lab
  Thesis: Symbolic Regression and Sequence Modelling with Conditional and Dynamic Language Models
University of Waterloo (UW)   **Part-time Master: MBET**   September 2022 - September 2025
Shiraz University (SHIRAZU)   **M.Sc.: Artificial Intelligence and Robotic**   September 2015 - September 2018
  Thesis: Self Driving Cars Using Behavior Reflex Methods
Jundi-Shapur Uni. of Tech. (JSU)   **B.S.: Computer Hardware Engineering**   September 2011 - September 2015
  Thesis: Design and Implementing of an Intelligent Navigation System

Work Experiences: Internships and Jobs

- Consultant: Coastal Carbon - Tech AI Lead   ON, Canada — September 2023 - Present
  I designed and developed the AI pipeline to detect, segment, and measure underwater coastal seaweeds from satellite imagery.
- Affiliate: Vector Institute - Faculty Affiliate Researcher   ON, Canada — July 2022 - Present
  I pre-trained a GPT 24-Layers Language Model with 64 GPUs using a dataset collected and crawled from the Internet.
- Internship: Huawei Noah's Ark Lab - Research Associate   ON, Canada — September 2021 - December 2023
  I worked with the NLP team to design and develop novel algorithms for efficient language models and multi-modal visual & language pre-training/tuning.
- Startup: Daneshbaz.com - Founder & Product Designer   ON, Canada — April 2021 - Present
  Our platform helps researchers to write papers easier and publish them faster without wasting time.
- Internship: Oracle Labs - Research Associate   ON, Canada — May 2021 - September 2021
  I worked with the AutoML team to design and develop a novel algorithm for automatic data drift detection.
- Job: Udacity - Independent Consultant   December 2018 - January 2019
- Internship: Computer Vision Center - Visiting Student   Barcelona, Spain — July 2018 - October 2018
  I worked with the research team behind CARLA Simulator to design a modified co-training algorithm to improve the generalization capability of Faster-RCNN in Kitti and Cityscapes. Later, it leads to the following publication: Co-Training for On-Board Deep Object Detection
- Job: Udacity - Independent Consultant   November 2016 - October 2018
- Job: Vaeda Research Group - Consultant   Tehran, Iran — August - October 2014
- Internship: Iran Telecom Research Center - Intern   Tehran, Iran — July - September 2014

Key Experiences: Publications

- Systematic Bias of Large Language Models (Under Review): Huawei Confidential   2023
- QDyLoRA (Neurips ENLSP 2023): QDyLoRA: Quantized Dynamic Low-Rank Adaptation for Efficient Large Language Model Tuning   2023
- Sorted LLAMA (EACL 2024): Sorted LLaMA: Unlocking the Potential of Intermediate Layers of Large Language Models for Dynamic Inference Using Sorted Fine-Tuning (SoFT)   2023
- SortedNet (Under Review): A Place for Every Network and Every Network in its Place: Towards a Generalized Solution for Training Many-in-One Neural Networks   2023
- Patent (Huawei): Methods and Processors For Training A Neural Network   2023
- Paper (EACL 2023): DyLoRA: Parameter Efficient Tuning of Pre-trained Models using Dynamic Search-Free Low-Rank Adaptation   2022
- Paper (Neurips ENLSP 2022): SymbolicGPT: A Generative Transformer Model for Symbolic Regression   2021
- Patent (Oracle): Automated dataset drift detection   2021
- DBaz Paper: Probabilistic Language Models Can Be Biased Even When The Data is Unbiased!   April 2021
- Journal (Medical Image Analysis): Fine-Tuning and Training of DenseNet for Histopathology Image Representation Using TCGA Diagnostic Slides   2020
- DBaz Paper: Introducing a Concept Framework Using Causal Discovery and Deep Causal Modeling   December 2020
- DBaz Paper: Dodge Learning For Self-Driving Cars   2018
- Paper (IEEE): Using Machine Learning Approaches to Detect Opponent Formation   April 2016
- Paper (ICL): Assessing the Role of AR-Based Content in Improving Learning Performance   September 2015

Key Experiences: Projects

- Project: Learn Transformer-Based Language Models for Creative Sequence Generation with Structural Constraints 2021
- Project: Learn and Transfer Styles in Deep Text Generative Models 2018-Ongoing
- Project: Datadays 2019, Challenge 2 - Deep Learning Based Categorical NLP Classification 2018
- Project: Programming A Real Self-Drivng Car 2017
- Project: FARAZ Unmanned Ground Vehicle September 2015
- Project: FARAS Unmanned Aerial Vehicle September 2015

Technical Skills

- Deep Learning Frameworks: PyTorch, Tensorflow, Keras
- Programming Languages: Python, C/C++, Visual Basic, HDL, Assembly
- Web Technologies: XML, HTML, CSS, Markdown, JQuery, Wordpress
- Math/Stat Packages: Matlab, Octave, Mathematica
- Graphic/VFX: Adobe AfterEffect, Photoshop, Illustrator
- Robotics: ROS, URDF, SDF, SolidWorks, Digital Datcom, Proteus

Academic Experiences: Chairs, Workshops and Mentorship

- Reviewer: ACL Rolling Review (ACL, NAACL, EACL) December 2023
- Reviewer: AAAI Edge Intelligence Workshop December 2023
- Technical Committee: The 3rd workshop on the Efficient Natural Language and Speech Processing (ENLSP-III) December 2023
- PhD Seminar: SortedNet - Invited Faculty: Gautam Kamath October 2023
- PhD Seminar: SymbolicGPT - Invited Faculty: Jimmy Lin September 2023
- PhD Seminar: DyLoRA - Invited Faculty: Pascal Poupart August 2023
- Invited Talk: SymbolicGPT @ Vijay Ganesh Research Lab July 2023
- Invited Talk: DyLoRA @ Aggregate Intellect (AISC) June 2023
- Technical Committee: The 2nd workshop on the Efficient Natural Language and Speech Processing (ENLSP-II) December 2022
- Session Chair: Institute for Research in Fundamental Sciences (IPM) - Sixth IPM Advanced School on Computing: Artificial Intelligence, YouTube Links: Session 1, Session 2 September 2022
- Reviwer: The 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP) 2022 August 2022
- Talks: Understanding DeepMatch - Balancing Deep Covariate Representations (CS 886 - Causal Inference - Prof. Yaoliang Yu) November 2020
- Talks: Rethinking Action Space For RL (CS 885 - Reinforcement Learning - Prof. Pascal Poupart) July 2020
- Talks: A primer on Bertology (CS 886 - Deep Learning for Natural Language Processing - Prof. Ming Li) Mar 2020
- Session Chair: Institute for Research in Fundamental Sciences (IPM) - Fourth IPM Advanced School on Computing: Artificial Intelligence, YouTube Links: Session 1, Session 2 August 2020
- Lecturer: SHIRAZU - Deep Learning Workshop at AISP 2017 (The 19th CSI International Symposium on Artificial Intelligence and Signal Processing) – Computer Vision with Deep Learning October 2017
- Lecturer: SHIRAZU - Deep Learning Workshop - Advanced Keras July 2017
- Lecturer: SHIRAZU - Deep Learning Workshop - Tensorflow February 2017
- Mentor: Udacity - Self-Driving Car Nanodegree November 2016 - October 2018

Achievements: Scholarship, Certifications, and Activities

- Award: $800 Huawei Innovation Pioneer For SortedNet July 2023
- Certification: Our article was linked to the United Nations Sustainable Development Goals to help tackle some of the world's greatest challenges. October 2022
- Fellowship: $35000 Entrepreneurial Ph.D. Fellowship Fall 2022
- Award: $2500 Pasupalak CS Capstone Award Fall 2021
- Scholarship: $1000 University of Waterloo Graduate Scholarship Winter 2020
- Scholarship: $45000 Full Ph.D. Scholarship Fall 2019
- Competition: Top 0.002% at Datadays 2019 (Internet-based Competition) 2018
- Certification: Self-Driving Car Engineer October 2017
- Scholarship: Udacity's Sponsored Service Scholarship for Self-Driving Car Engineer Nanodegree program (2500$) October 2016
- Competition: Ranked 6th in the 2D Soccer Simulation League, Robocup World Championship, Leipzig, Germany July 2016
- Competition: Ranked 1st in the 2D Soccer Simulation Technical Challenge, 5th in the Soccer Simulation League, Robocup, IranOpen, Tehran, Iran April 2016
- Award: Admission as a Top Student (Exempt from passing the national university entrance exam) September 2015
- Award: Selected by Ministry of Science, Research and Technology and Iran Vice President of Technology in Engineering and Technical Research February 2014, and 2015 (Second Time)
- Award: Best Student Award at JSU Multiple Times: 2012, 2013 and 2014

- Competition: Ranked 4th/70 in technical design at the first national UAV design competition in the northwest   February 2013

Impact & News Coverage

- Blog: Neural-Symbolic Regression: Distilling Science from Data
- News: Meet the 7 recipients of the first Entrepreneurial Ph.D. Fellowship
- News: Meet the 20 Teams that Pitched in the Concept $5K Semi-Finals
- Medium: Udacity Students on Computer Vision, Tiny Neural Networks, and Careers
- Blog: Hacker News: DyLoRA: Parameter Efficient Tuning of Pre-Trained Models
- Conference: EACL 2023 Accepted Papers
- Git: Implement DyLoRA #289
- Git: Anyone tried Dynamic LoRA (DyLoRA) to speedup #142
- Stable Diffusion Libraries: Training, generation and utility scripts for Stable Diffusion
- News: Daneshbaz: Open Knowledge, Open Research, Open Ideas

Research Interests

Deep Learning, Natural Language Processing, Artificial General Intelligence, Machine Vision, Self-Driving Cars