Mahdieh Abbasi

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A dedicated, result-driven, and team-oriented Machine Learning (ML) research scientist with **6 years** of proven research and development experiences. Creative in devising deep learning solutions for computer vision tasks (e.g. object detection and activity recognition) and proficient in implementing them using cutting-edge Python libraries. Specialist in dependable and robust deep neural networks in presence of unknown samples and adversarial example attacks. Demonstrated experiences in independently and collaboratively conducting research projects in ML and publishing the scientific results.

Keywords: Computer Science | Robust Convolution Neural Networks | Object Detectors (YOLO, Faster RCNN) | Python | Scikitlearn & Scipy | Pytorch & TensorFlow | Docker | Git | Cluster Computing

EDUCATIONS

- **Doctorate**, Electrical and Computer Engineering, **Université Laval** (UL) 2015-2020
  Institute Intelligence and Data (IID), Québec, Canada
  Thesis Title: Toward Robust Deep Neural Networks
  Supervisor: Prof. Christian Gagné (professor at MILA)
  Co-supervisor: Prof. Denis Laurendeau

- **Master of Science**, Artificial Intelligence, **Alzahra University** 2010-2012
  Digital Media Lab (DML), Tehran, Iran
  Thesis Title: 3D Human Pose Estimation
  Supervisor: Prof. H. Reza Rabiee (Sharif University of Technology)

- **Bachelor of Science**, Computer Science, **Sharif University of Technology** (SUT) 2005-2010
  DML, Tehran, Iran
  B.Sc. Project: Community Detection in Social Networks
  Supervisor: Prof. H. Reza Rabiee

AWARDS & DISTINCTIONS

- **Best Paper Award**, 33rd Canadian Conference on Artificial Intelligence (CAI), 2020
  Ottawa, Canada
- **Travel Award**, International Joint Conference on Artificial Intelligence (IJCAI), 2019
  Macao, China
- **Award Otis-Lalonde in Artificial Vision**, 2016,2017
  UL, Canada
  (2000$CA Awarded two times for the papers published in 3DVision IEEE & ICLR-W)

- **MITACS Fellowship**, E Machine Learning 2017
  UMR (Unité Mixte de Recherche), Québec, Canada
- **Graduate Fellowship,** UL, Québec ,Canada 2015,2016
- **Accepted to attend Deep Learning Summer School** 2016
  Université de Montreal, Montreal, Canada (**acceptance rate 30%**)

- **Accepted in the best technology university in Iran** (SUT) as ranked 2005
  among top 1% among almost 500,000 participants in the national university entrance exam

COMPUTING SKILLS

- **Programming Languages**: Python (proficient level), Java, Matlab, C++
- **Python Packages (proficient level)**: sikit-learn, scipy, numpy, matplotlib, Pandas
- **Deep Learning Libs. (proficient level)**: Theano, Lasagne, TensoreFlow, Pytorch
- **Command-line OS** : Linux (Ubuntu), Mac OS
- **Distributed cluster-computing**: CalculQuebec (working with clusters of GPUs)
- **Related Applications*:*** Latex, Git, Docker, SQL Server 2012, MySQL

WORK EXPERIENCES

- **ML for Community-based Healthcare Systems** February 2020
  Research Assistant at Family Medicine, McGill University, Montreal, Canada
  Systematic review of explainable AI for community-based healthcare systems and co-writing a commentary paper on the use of AI for controlling COVID-19 outbreak.

- **Robust Object Detector for Partially-labeled Datasets** May2019-Sep2020
  Computer Vision and Systems Lab & Thales, Québec, Canada
  with the goal of building a larger scale dataset by merging medium-scale ones, devised a self-supervised framework (using Pytorch) for training a robust object detector (YOLO) on a partially labelled dataset.

- **Hockey Player Identification by Jersey Number Recognition** May-August 2018
  Stradigi AI company, Montreal, Canada
  Develop and implement (using Tensorflow) a weakly supervised deep learning based pipeline for localizing and recognizing jersey numbers.

PUBLICATIONS

- **M. Abbasi**, D. Laurandeau, C. Gagné, "Self-supervised Robust Object Detectors from Partially Labelled Datasets", https://arxiv.org/abs/2005.11549, 2020.

- M. Abbasi, A. Rajabi, C. Gagne, R. Bobba, "Toward Adversarial Robustness by Diversity in an Ensemble of Specialized Deep Neural Networks ", Long paper in Canadian Conference on AI, 2020 [**Best paper award and oral presentation**].

- **M. Abbasi**, C. Shui, A. Rajabi, C. Gagne, R. Bobba, "Towards metrics for differentiating Out-of-Distribution sets ", **NeurIPS** Workshop on Safety and Robustness in Decision-Making, 2019, and European Conference on Artificial Intelligence (**ECAI**), 2020 [**oral at ECAI, acceptance rate ~26%**].

- C. Shui, **M. Abbasi**, L.E. Robitaille, B. Wang, C. Gagné, "A Principled Approach for Learning Task Similarity in Multitask Learning", International Joint Conference on Artificial Intelligence (**IJCAI**), 2019 [**poster, acceptance rate ~18%**].

- **M. Abbasi**, A. Rajabi, A.S. Mozafari, R.B. Bobba, C. Gagné, "Controlling Over-generalization and its Effect on Adversarial Examples Generation and Detection", arXiv: 1808.08282, 2018.

- **M. Abbasi**, A. Rajabi, C. Gagné, R. B. Bobba, "Towards Dependable Deep Convolutional Neural Networks (CNNs) with Out-Distribution Learning", Dependable and Secure Machine Learning (DSML), co-located with Dependable System Networks (**DSN**), 2018.

- **M. Abbasi**, and C. Gagné. "Robustness to Adversarial Examples through an Ensemble of Specialists." International Conference on Learning Representations (**ICLR**) Workshop, 2017.

- F. Kiaee, C. Gagné, **M.Abbasi**, "Alternating Direction Method of Multipliers for Sparse Convolutional Neural Networks.", arXiv:1708.04788, 2017

- **M. Abbasi**, H. R. Rabiee, and C. Gagné. "Monocular 3D Human Pose Estimation with a Semi-supervised Graph-based Method." International Conference on **3DVision**, IEEE, 2015. [**oral, 15% acceptance rate for oral**]

PRESENTATIONS & TALKS

- **Virtual Talk at European Conference on Artificial Intelligence**, Santiago de Compostela, Spain, 2020
- **Poster Presentation at NeurIPS Workshop**, Vancouver, Canada, 2019.
- **Poster Presentation at Montreal AI Symposium**, Montreal, Canada, 2017, 2018, 2020.
- **Poster Presentation at International Conference on Learning Representation**, Toulon, France, 2017.
- **Talk and Poster Presentation at 3DVision(IEEE)**, Lyon, France, 2015.

LANGUAGES

- **English**: Advanced (TOFEL 91/120 and ILETS 6.5/9) | **French**: Intermediate | **Persian**: mother tongue

VOLUNTEER EXPERIENCES

- **Data Anonymization and Synthesis** August 2020
  An industrial problem proposed by **Desjardin and Bank of Canada** at **10th Industrial Problem Solving Workshop (IPSW), Montreal, Canada**
  *As a team member, review the literature of synthesizing anonymized data and implement **MedGAN** to synthesize tabular data for home credit risk dataset (a Kaggle dataset)*
- ***Review***
  Pattern Recognition Letters, ICLR2019, NeurIPS2018, NeurIPS2017