FERESHTEH FORGHANI

CONTACT INFORMATION
forghani@yorku.ca | Personal Website
Google Scholar | LinkedIn

RESEARCH INTERESTS
Generative Models, Computer Vision, Deep Learning, Machine Learning

EDUCATION

York University
M.Sc. in Computer Science *2022-Present*
Supervisor : Dr. Marcus Brubaker
GPA : **A+**
Coursework :

- *University Courses* : Neural Network and Deep Learning(A+), Computer Vision (A+), Machine Learning Theory (A+), Data Mining (A+)
- *Online Courses* : Deep Unsupervised Learning (UC Berkeley CS294, online, audited), CNNs for Visual Recognition (Stanford CS231n, online, audited)

Sharif University of Technology
B.S. in Computer Engineering *2017-2022*
GPA : **18.53**/20
Thesis : Improve cell segmentation using self-supervised frameworks (SimCLR, MoCo, SimSiam)

PUBLICATIONS
Jason J. Yu, **Fereshteh Forghani**, Konstantinos G. Derpanis, Marcus A. Brubaker. *Long-Term Photometric Consistent Novel View Synthesis with Diffusion Models*, ICCV 2023. (arXiv, webpage)

RESEARCH EXPERIENCE

Research Assistant at York University
Advised by Dr. M. Brubaker, *Sep 2022-Present*
Novel View Synthesis with Diffusion Models using Set Representation Transformers

- Conduct a literature review on Diffusion Models and their applications as a directed reading course.
- Using conditional diffusion model to generate novel views of a scene using only one view.
- Training **Scene Representation Transformer** on **Multi-Shapenet** dataset and use it as a condition for the diffusion model to improve consistency among generated novel views.

Summer Intern at Ecole Polytechnique Federale de Lausanne (EPFL)
Advised by Dr. A. Alahi, Visual Intelligence for Transportation (VITA) Lab *Jul 2021-Feb 2022*
Realistic Adversarial Attack on Human Trajectory Predictor

- Conducted a literature review on density estimation techniques and their applications on human trajectory data.
- Used Masked autoregressive flow to find natural adversarial examples to test the reliability of human trajectory predictors.
- Adversarially trained LSTM based predictors and reduced the **collision rate** up to **35%** in the case of an adversarial attack on test data.

Research Assistant at Sharif University of Technology *Oct 2020-Feb 2022*
Advised by Prof. Mohammad Hossein Rohban, Medical Image Analysis Group, Department of Computer Engineering
Cell Segmentation using a Self-supervised Framework

- Used unsupervised learning frameworks (simCLR, MoCo, SimSiam) to train U-net encoder with unannotated cell images.
- Improved mean average precision (mAP) after fine-tuning with annotated ones **up to 8%**.

WORK EXPERIENCE

Machine Learning Intern at Sinaweb Company *Summer 2020*
Intrinsic Plagiarism detection

- Extracting lexical, structural, and syntax features.
- Proposed a regression model to fuse features and predict writing style.
- Implemented an outlier detection model to find possible plagiarised segments.

TECHNICAL SKILLS

Languages and Tools:

- Programming: Python, Java, C/C++
- Vision/ML Libraries: PyTorch, TensorFlow, Numpy, Scikit-Learn, OpenCV
- Data Manipulation: Pandas, SQL

HONORS AND AWARDS

Vector Faculty Affiliate Researcher *2023*

Vector Scholarship in AI and Member of Vector Institute *2022*

17,500 CAD, Awarded to exceptional candidates pursuing an AI-focused master's program.

VISTA Program Master's Scholarship *2022-2024*

10,000 CAD per year, Awarded to high-calibre scholars doing research in computer vision.

York Graduate Scholarship *2022*

6,000 CAD, Awarded to top-ranked applicants based on academic merit.

National University Entrance Exams (Konkur)

Ranked 125^{th} among 150,000 in Mathematics and Physics 2017

National Elite Foundation Fellowship *2017-2021*

ADDITIONAL TRAINING

Deep Learning and Reinforcement Learning Summer School (DLRLSS) *July 2023*

Cover the foundational research, new developments, and real-world applications of deep learning and reinforcement learning, Montreal, Canada. Certificate

UNIVERSITY PROJECTS

- Computer Vision Course Homework : (Python) (Github Link) *Fall 2022*
  - Image Filtering : Canny Edge Detection, Seam Carving
  - RANSAC-based Image Stitching
  - Optical Flow Estimation
- Cleaned data and trained models to find best clickthrough rate, Machine Learning Course Project (Python) *Fall 2020*
  (Github Link)
- Preprocessed, classified and clustered English Ted Talks and Persian Wikipedia pages to design an information retrieval system with search and query correction abilities, Modern Information Retrieval Course Project (Python) *Fall 2020*
  (Github Link)
- Appointment making website, System Analysis and Design Course Project (Django framework) (Gitlab Link) *Spring 2020*

SOCIAL SKILLS

Teamwork, Fast Learner, Problem Solving, Creativity

TEACHING EXPERIENCE

Teaching Assistant

- Machine Learning and Pattern Recognition, Dr. Qin *Fall 2023*
- Building Interactive Systems, Dr. Kyan *Winter 2023*
- Machine Learning (graduate course) Dr. Hosseini *Spring 2021 & Fall 2021*
- Artificial Intelligence, Dr. Rohban *Spring 2021*

VOLUNTEER EXPERIENCE

Member of Data Days Scientific Group (DataDays - A Machine Learning and Data Science Competition) Sharif University of Technology *Nov 2019 - Mar 2020*

LANGUAGES

English (Fluent)

- **TOEFL : 109/120** Reading : 30/30, Listening : 30/30, Speaking : 26/30, Writing : 23/30

Persian (Mother tongue)