FERESHTEH FORGHANI

CONTACT INFORMATION
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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, 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*, Under review at ICCV 2023, March 2023. (arXiv, webpage)

RESEARCH EXPERIENCE

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

- Working on using scene set representation with diffusion models to improve Novel View Synthesis
- Conduct a literature review on Diffusion Models and their applications as a directed reading course

Internship at Ecole Polytechnique Federale de Lausanne (EPFL)
Advised by Prof. 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 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*

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

- 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)