# Leili Goli

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## Research Interests

Machine Learning | Deep Learning | Artificial Intelligence
Computer Vision | Computer Graphics | Robotics

## Education

**University of Toronto** — Toronto, Canada
Ph.D. (Direct Entry) in Computer Science — Sept. 2021 – Expected Nov. 2026

- **Current GPA 4/4**

**Sharif University of Technology** — Tehran, Iran
B.Sc. in Computer Engineering — Sept. 2017 – Jun. 2021

- **GPA 19.35/20** (equivalent to major GPA of 4/4)

## Research Experience

**Ph.D. Graduate Research Assistant in University of Toronto** — Sept. 2021 - Present
Dynamic Graphics Project (DGP), Department of Computer Science — Toronto, Canada
*Supervisor: Professor Alec Jacobson, Professor Andrea Tagliasacchi*

- Robustness and Enhancement of Implicit Neural Fields in 3D vision

**Student Researcher** — Sept. 2021 - Present
Vector Institute, Department of Computer Science — Toronto, Canada

**Summer Internship in Technical University of Munich (TUM)** — Jun. 2020 - Mar. 2021
Interdisziplinäres Forschungslabor (IFL), Computer Aided Medical Procedures (CAMP) — Munich, Germany
*Supervisor: Professor Nassir Navab*

- My research is focused on segmentation of longitudinal chest CT scans of COVID-19 patients and prediction of clinical information.

**Summer Research Program in University of British Columbia (UBC)** — Jun. 2019 - Sept. 2019
Robotics and Control Laboratory, Department of Electrical and Computer Engineering — Vancouver, Canada
*Supervisor: Professor Purang Abolmaesumi*

- I devised experiments in deep learning applications in medical image analysis, with particular focus on ultrasound probe navigation using cardiac ultrasound images.

**Research Assistant in Sharif University of Technology** — Sept. 2019 - Mar. 2021
Image Processing Laboratory (IPL), Department of Computer Engineering — Tehran, Iran
*Supervisor: Professor Shohreh Kasaei*

- I investigated Adversarial Attacks and Defenses against Deep Neural Networks, specifically focusing on robustness against rotation and scale transformations.

## Publications

**L. Goli**, C. Reading, S. Sellán, A. Jacobson, A. Tagliasacchi, "**Bayes' Rays: Uncertainty Quantification for Neural Radiance Fields**", preprint

**L. Goli**, D. Rebain, S. Sabour, A. Garg, A. Tagliasacchi, "**nerf2nerf: Pairwise Registration of Neural Radiance Fields**", Accepted to IEEE International Conference on Robotics and Automation (ICRA) 2023, Computer Vision and Pattern Recognition (CVPR) Workshop XRNeRF 2023

**L. Goli**, ST. Kim, A. Khakzar, N. Navab, "**Longitudinal Quantitative Assessment of COVID-19 Infection Progression from Chest CTs**", Accepted to Medical Image Computing and Computer Assisted Intervention (MICCAI) 2021.

H. Naderi, **L. Goli**, S. Kasaei, "**Generating Unrestricted Adversarial Examples via Three Parameters**", Accepted to Multimedia Tools and Applications 2021.

H. Naderi, **L. Goli**, S. Kasaei, "**Scale Equivariant CNNs with Scale Steerable Filters**", Accepted to Machine Vision and Image Processing (MVIP) 2020.

## Press Coverage

Cover of the Computer Vision News: nerf2nerf with Lily Goli

Story highlight in fxguide News: Stitching NeRFs: 'nerf2nerf':Pairwise Registration of Neural Radiance Fields.

## Honors and Awards

**Ranked $\underline{38^{th}}$ in the Iranian National Universities Entrance Exam for Bachelor of Science** Aug. 2017
among more than 150,000 participants.
**National Elite Foundation Fellowship** 2017

## Invited Talks

nerf2nerf, Google Geo group, Google 2023

Bayes' Rays, SynthX group, Google 2023

## Work and Teaching Experience

**Teaching Assistant at University of Toronto**, Toronto, Canada Fall 2021 - Present

- Foundations of Computer Science course (CSC110)
- Data Science I (JSC270)
- Introduction to Image Understanding (CSC420)
- Introduction to Machine Learning (CSC311)

**Intern at Arsh**, Tehran, Iran Spring 2020

- Developing an age detection network using noisy labels in Pytorch framework.
- Visualizing and presenting hundreds of processed and classified mining reports in an understandable and effective manner.

**Teaching Assistant at Sharif University of Technology**, Tehran, Iran Fall 2019 - Spring 2021

- Artificial Intelligence - Linear Algebra - Engineering Probability and Statistics

## Skills

**Programming Languages**: Python (Proficient), C (Proficient), Java (Proficient), R, MATLAB, HTML, CSS

**Frameworks**: PyTorch, Keras, Django, QT

**Tools**: Blender, CLion, PyCharm, IntelliJ, Proteus, Quartus

**Operating Systems:** macOS, Linux, Windows

## Relevant Coursework

Introduction to Machine Learning (4/4), Physics-based Animation (4/4), Probabilistic Learning (4/4), Neural Radiance Field Reading Course (4/4), Imitation Learning, Image Processing (20/20), Artificial Intelligence (20/20), Modern Information Retrieval (18.2/20), Probability and Statistics for Computer Engineering (20/20), Linear Algebra (19.4/20), Numerical Computations (20/20), Design of Algorithms (20/20), Data Structures and Algorithms (20/20), Fundamentals of Programming: C (20/20), Advanced Programming: Java (20/20), General Math 1 (19/20), General Math 2 (19.5/20), Discrete Mathematics (18/20)