# Amirhesam Taherzadegan

*Photogrammetrist , Computer vision developer*


Taherzadehesam@gmail.com

HesamTaherzadeh

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Portfolio


## Professional Experience

**Algorithm Engineer - SLAM Branch** 09/2023 – present
*Software Motion* Suzhou, China

- Contributed as a **core member** of the **Mapping Team**
- **Led the HDMap and OfflineMap development** for the JAC Automotive project
- Played a pivotal role in **Lane Line Tracking and Localization**, optimizing accuracy for self-driving systems.
- Designed and implemented an **online localization and mapping codebase** with robust **GPS disruption handling** for ADAS.
- Developed an **IMU pre-integration module** leveraging **GTSAM**, improving sensor fusion accuracy.
- Delivered **40+ hours of technical training sessions**
- Mentored **4 new team members** over a 1-month program,

**Math for AI graduate course Teaching Assistant** 09/2023 – 01/2024
*Khajeh Nasir University of Technology* Tehran, Iran

- Supervised students' mathematical correctness.

Course website

**Head of least squares optimizations and hypothesis testing Teaching Assistant (TA) Team** 09/2021 – present
*Khajeh Nasir University of Technology* Tehran, Iran

- Held **+50 hours** of class and online content for the course
- **Taught** the practical part of the course (**Practical Convex Optimization**).

Youtube playlist

**Embedded computer vision developer** 06/2022 – 09/2022
*Devspec* Tehran, Iran

Developed a deep learning-based Lane Departure Warning system for **ARM CPUs** (Jetson nano, Raspberry Pi 3b), using Tensorflow lite and OpenCV **with Quantization**

**Linear algebra Teaching Assistant (TA)** 02/2022 – 07/2022
*Khajeh Nasir University of Technology* Tehran, Iran

*Implementing algebraic algorithms*

**Computer vision Developer** 02/2022 – 07/2022
*Khajeh Nasir University of Technology* Tehran, Iran

- Developed a full-fledge desktop application for 3D reconstruction.
- Utilized **OpenGL and Qt** to create the application with **GUI**.
- Implemented **multi-threading** to process over **50** full-size images **with geotags**

## Education

**Master of Science in Photogrammetry** 09/2023 – present
*Khajeh Nasir University of Technology* Tehran, Iran

**GPA : 19.21/20 (4/4) - 3 credit remaining**

Photogrammetry is performing accurate measurements on images, 3D computer vision

Thesis: Deep Dense, Metric, Monocular VI-SLAM

**Bachelor of Science in Geomatics engineering** 09/2019 – 06/2023
*Khajeh Nasir University of Technology* Tehran, Iran

**GPA : 18.45/20 (4/4)**

Thesis : Developing a deep learning based visual odometry system for ARM CPUs, First Rank of Class of 2019 in geomatics at KNTU

## Awards

**Accepted in Photogrammetry Msc. program at KNTU through Iran National Elites Foundation (INEF) scholarship**

**Accepted into a flowship program in ETH zurich for RobotX center with 6% acceptance rate - Hosting lab : Computer vision and Geometry**

## Skills

**C++ Programming**
*OOP, Multi-threading, Design pattern, Memory management*

**Python Programming**
*OOP, Design patterns and Scientific computations*

**Robotics Perception**
*Traditional & learned approaches, Trackings, and 3D scene understanding*
- *PCL, OpenCV, Open3D*

**SLAM**
Filter-based & PGO-based
*LiDAR , Visual, Visual-inertial*

**ROS**
Extensive experience with Melodic, Noetic, Humble - RViZ, Gazeboo

**Deep learning Model & Engineering**
- PyTorch, TensorFlow, ONNX and Quantizations

**Probabilistic Robotic and Computer vision**
Pose Graph Optimization
- GTSAM, Ceres Solver

**Sensor Fusion and Calibration**
*Kalman Filter family,*
*IMU-Image intrinsics, IMU-LiDAR-Camera Calibs*
- *Kalibr, Allan*

## Languages

**English**
~7 IELTS (Exam will be taken ASAP)

**Persian**
Native

## Projects

**Indoor Monocular Depth Estimation**
*Supervised approach*
Monocular depth estimation network for Indoor environment trained on DIODE(Dense Indoor and Outdoor DEpth) dataset

**Deep learning based LDW system**
written in C++ and python and also has been tested in Jetson Nano 2GB and Raspberrty pi 3b and has 3 different outputs regarding the warning

**Meta-heuristic Regression**
Utilizing GA to avoid overfitting of parameters in C++

**PCST**
Photogrammetric Coordinate System Transformer, in short PCST, is a python based GUI program, that intends to help photogrammetrist and computer vision analyst, rapidly pick the best model on their data

**Visual odometry and Triangulation using OpenCV C++ API**
Self localization(6 DOF) and Triangulation of feature points of a calibrated camera embedded in raspberry pi 3b, GPS-enabled using an external module

## Courses

**Deep Learning Specialization (5 course)**
*Deep learning.AI*

**Introduction to Statistics**
*Stanford Online*

**Tensorflow developer and Advanced Tensorflow developer (8 courses)**
*Deep learning.AI*