

Hossein Sheikhi Darani

Robotics Algorithms and Motion Planning (RAMP)

Simon Fraser University

Personal webpage | Personal email

EDUCATION

2020 – NOW

M.SC. IN SYSTEMS AND ROBOTICS, SIMON FRASER UNIVERSITY

Master Thesis: Autonomous industrial mobile robot

2013 – 2018

B.SC. IN COMPUTER ENGINEERING, K. N. TOOSI UNIVERSITY OF TECHNOLOGY

Bachelor Thesis: Motion planning with constraint on motion model uncertainty for a quadrotor, its simulation and real implementation

RESEARCH INTERESTS

- Robotics Perception (Path Planning, Machine Vision, Deep CNN, Deep RL)

PUBLICATION

Hossein Sheikhi Darani, Ali Noormohammadi , Hamid D. Taghirad, “Simulation and Real implementation of path planning under uncertainty for a UAV”, *IEEE Conference on Robotics and Mechatronics (ICROM)*, 2019

HONORS AND AWARDS

- Received the 1st Place Award in The International Micro Air Vehicle competition (IMAV), 2016, China, Beijing
- Received the Best in class Autonomy Award in The International FIRA CUP in Rescue League, 2015, Iran, Tehran
- Received the 2nd Place Award in The International FIRA CUP in Rescue League, 2015, Iran, Tehran

RESEARCH EXPERIENCES

- RAMP Laboratory (2020 – now)
Research on robotics perception
- KN2C Robotics Team (2015 - now)
Software leader of UAV and UGV team
- ARAS Laboratory (2016 - 2018)
Research on path planning

NOTABLE PROJECTS

AUTONOMOUS ROBOTIC

- [Vision-Based outdoor Localization](#)
ResNet model is used for feature extraction of aerial images, and matching by pre-GPS-labeled aerial image for a UAV localization, 2019
- [Vision-Based indoor Localization](#)
EKF localization algorithm with known corresponding markers is used to localize a quadrotor by its onboard camera, simulation (Gazebo) and real implementation, 2018
- [Autonomous Quadrotor \[video\]](#)
RTAB-map, Frontier Exploration and Dijkstra algorithm by using ROS packages and RGBD sensor is used to a quadrotor explore the environment autonomously, 2016
- [Autonomous Rescue Robot \[video\]](#)
Hector-SLAM, Frontier Exploration and Dijkstra algorithm by using ROS packages and laser scanner is used to a rescue robot explore the environment autonomously, 2015
- [Object Detection \[video\]](#)
OpenCV library is used to line Detection, window Detection, land mark Detection for an autonomous quadrotor, 2017
OpenCV library is used to an Intelligent victim detection (BOF and SVM algorithm) for an autonomous rescue robot, 2014

MOTION PLANNING

- [Markov Decision Process \[simulation video\]\[real implementation video\]](#)
Modeling the motion planning problem of a quadrotor as a MDP problem to maximize the probability of avoiding collisions and successfully reaching a goal, 2018
- [Trajectory Controller](#)
A Switching controller based on Dynamic Feedback Linearization (DFL) implemented on a quadrotor for trajectory controller, 2018
- [Probabilistic Roadmap](#)
Discretization the configuration space for a quadrotor motion planning using PRM, 2018

OTHERS

- [Robot Operating System](#)
A ROS package for real-time RGBD sensor data transferring through Wi-Fi to the ground station, 2016
A ROS package as a driver for Parrot Bebop2 drone, 2017
- [Neural Network](#)
Digital Number Detection using Neural Network, 2016
- [Android](#)
An application for a waste management device, presented in CEBIT exhibition in Germany, 2018
An application for an intelligent pet-care device, 2018

ACADEMIC EXPERIENC

- Fall 2019, Teacher, Amir Kabir University Robotic High School, Basics in Robotics
- Fall 2018, Teacher, Salam High School, Teacher, Android programming and Introduction to IOT
- Spr. 2017&2018, Teacher , KN2C Robotic Team, Software in Robotic for entrance students
- Fall 2017, Teacher, Salam High School, Teacher, Junior soccer robot
- Fall 2017, Teaching Assistant, KNTU, Advanced of Computer Programming (Java languages)
- Spr. 2017, Teaching Assistant, KNTU, Fundamental of Data Structures
- Spr. 2015, Teaching Assistant, KNTU, Fundamental of Computer Programming (C languages)

SKILLS

- **Computer Skills:**
 - Programming language: C-Cpp, Python, Java, Android, VHDL
 - Libraries and frame works: Qt, OpenCV, ROS, Keras, Android, Arduino
 - Engineering software: Android Studio, Eclipse, Matlab , Xilinx, Code Vision
 - General Software: Microsoft office (Excel ,Word , PowerPoint)
- **Languages:**
 - Persian: Native
 - English: Professional - TOEFL iBT (Reading:27, Listening:28, Speaking:20, Writing:28, Total 103)