

Yaolin Ge

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SUMMARY

MSc. Student majoring in underwater engineering (N5T), with a strong aspiration in artificial intelligent underwater autonomous systems, specialising in sonar signal processing and underwater robotics.

EDUCATION

KTH Royal Institute of Technology

MSc, Maritime Engineering

Thesis: Signal Processing of Underwater Beacons for AUVs

Core courses: Applied Programming and Computer Science; Digital Signal Processing; Underwater Technology

Stockholm, Sweden

Expected Jun 2020

Peking University

Summer Research Student, Deep Learning and Robotic Dancing

Competition: Mapping the Human Motion to Dancing Robotics using OpenPose in OpenCV DNN module

Beijing, China

Jul. 2019 – Aug. 2018

Norwegian University of Science and Technology

MSc, Marine Technology, G.P.A. 3.93/4.00

Coursework: Underwater navigation and positioning; Seabed mapping; Underwater acoustics and optics

Trondheim, Norway

Aug. 2018 – Jun. 2019

University of Strathclyde

International Student Exchange Program, G.P.A. 3.85/4.00

Glasgow, United Kingdom

Sept. 2017 – Jan. 2018

Jiangsu University of Science and Technology

BSc, Ocean Engineering, G.P.A. 3.89/4.00, Rank: 2/230

Awards: National Scholarship (Top 1%) 2016; Undergraduate IoT Research Fellowship

Zhenjiang, China

Sept. 2014 – Jun. 2018

RESEARCH EXPERIENCE

KTH & Swedish Maritime Robotics Centre (SMaRC)

Sonar Signal Processing MSc Graduate

Stockholm, Sweden

Jan. 2020 – present

- Investigated the common navigation system for underwater vehicles such as LBL, USBL, SBL, INS etc.
- Implemented the advanced estimation algorithms such as EKF, UKF, CMF & QMF for active sonar detection and range estimation purposes, together using CA-CFAR and OS-CFAR to maintain constant false-alarm-rate
- Developed the underwater acoustic signal processing algorithms for range estimation subject to doppler effect
- Planned to conduct field trips to evaluate the performance of the acoustic beacon system at Askö waters

Supervisors: Peter Sigray, Professor; Martin Ludvigsen, Professor

KTH & Swedish Maritime Robotics Centre (SMaRC)

SD2709 Underwater Robotic Design Project

Stockholm, Sweden

Sept. 2019 – Dec. 2019

- Designed a new concept of the next generation flexible underwater robotics for seabed survey and IMR
- Simulated the trajectory path manoeuvring and navigation using PID controller together with Kalman filter
- Conducted the hardware-in-the-loop testing for motion control such as propeller speed control etc.

Supervisors: Ivan Stenius, Associate Professor

NTNU & Applied Underwater Robotic Laboratory (AURLab)

Seabed Survey Research Student

Trondheim, Norway

Jan. 2019 – Jun. 2019

- Studied the seabed sensing survey equipment, such as LAUV Fridtjof with sensors like SSS, MBES, CTD profiler, SBPs, FLS, Acoustic Modems, DVL, Camera etc.
- Planned the preliminary underwater survey paths such as YoYo / See-Saw patterns considering the bathymetry & topology of the seabed
- Conducted the field trip on board R/V Gunnerus at Skøgen to collect MBES data and SSS data, and applied TVG and photo-mosaic algorithms to extract and patch the seabed acoustic images for further research

Supervisor: Martin Ludvigsen, Professor

SKILLS & INTERESTS

Programming: C/C++, Python, MATLAB, ROS

Language: Chinese (native), English (full professional)

Interests: Running, cycling, cross-country skiing, artificial intelligence

AWARDS

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| 2019 | Intel® Edge AI Scholarship, Intel |
| 2019 | Best Popular Prize, AI + Art in Robot Dancing Competition, PKU |
| 2017 | Merit Student, MOE |
| 2016 – 2017 | National Scholarship, MOE |
| 2015 | National Encouragement Scholarship, MOE |

PROFESSIONAL MEMBERSHIPS

IEEE Membership (Student)

IEEE Robotics and Automation Society Membership

EXTRA-CURRICULAR

Deep Learning & TensorFlow Graduate

Coursera

- Studied common computer vision CNN models such as LeNet-5, AlexNet, VGG, ResNet etc.
- Trained a DNN model for computer vision applications using fashion MNIST dataset
- Employed the CNN model using TensorFlow Keras module for more complex image classification and object detection purposes
- Applied more advanced algorithms such as YOLO algorithm for car detections and Siamese network for face recognition

SLAM, Simultaneous Localization and Mapping Workshop

CEU, IEEE

- Studied the SLAM principles and uncertainty models such as Uni-Modal, Multi-Hypotheses, Grid Tessellation, and Topological
- Simulated the hybrid SLAM using both Kalman filters and Particle filters

Sensor Fusion NanoDegree Graduate

Udacity

- Applied Ransac and KD-Tree based Euclidean clustering algorithms for detection and tracking of autonomous vehicles using Lidar data
- Studied and applied radar principles for range-doppler estimation and implemented CFAR techniques to remove the clutter noises and generated RDM (Range Doppler Map)
- Investigated other common sensors for machine perception such as Camera etc.
- Worked with simulators to merge all sensing data

Peking University

Beijing, China

Summer campus program in Robotic Dancing, PKU

Jul. 2019 – Aug. 2019

- Studied the deep learning principles and investigated OpenPose algorithm
- Conducted the motion capture technique for the robotics and converted the 2D motion to 3D skeletons for further mapping to robotic motion
- Programmed Yanshee Robot to dance following human motions

REFEREES:

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| Hedvig Kjellström Professor | Dept. of Intelligent Systems, KTH hedvig@kth.se | +46 8 790 69 06 |
| Ivan Stenius Associate Professor | Dept. of Aeronautics and Vehicle Engineering, KTH stenius@kth.se | +46 70 288 82 63 |
| Martin Ludvigsen Professor | Dept. of Marine Technology, NTNU martin.ludvigsen@ntnu.no | +47 91897272 |