Yaolin Ge

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SUMMARY

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

EDUCATION

KTH Royal Institute of Technology   **Stockholm, Sweden**
MSc, Maritime Engineering   Expected Jun 2020
Thesis: Signal Processing of Underwater Beacons for AUVs
Core courses: Applied Programming and Computer Science; Digital Signal Processing; Underwater Technology

Peking University   **Beijing, China**
Summer Research Student, Deep Learning and Robotic Dancing   Jul. 2019 – Aug. 2018
Competition: Mapping the Human Motion to Dancing Robotics using OpenPose in OpenCV DNN module

Norwegian University of Science and Technology   **Trondheim, Norway**
MSc, Marine Technology, G.P.A. 3.93/4.00   Aug. 2018 – Jun. 2019
Coursework: Underwater navigation and positioning; Seabed mapping; Underwater acoustics and optics

University of Strathclyde   **Glasgow, United Kingdom**
International Student Exchange Program, G.P.A. 3.85/4.00   Sept. 2017 – Jan. 2018

Jiangsu University of Science and Technology   **Zhenjiang, China**
BSc, Ocean Engineering, G.P.A. 3.89/4.00**,** Rank: 2/230   Sept. 2014 – Jun. 2018
Awards: National Scholarship (Top 1%) 2016; Undergraduate IoT Research Fellowship

RELEVANT EXPERIENCE

KTH & Swedish Maritime Robotics Centre (SMaRC)   **Stockholm, Sweden**
Sonar Software MSc Graduate   Jan. 2020 – present
- Reviewed the common navigation system for underwater vehicles such as LBL, USBL, SBL, INS etc.
- Studied 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
- Planned to conduct field trips to evaluate the performance of the signal processing algorithms

Supervisors: Martin Ludvigsen, Professor; Peter Sigray, Professor

KTH & Swedish Maritime Robotics Centre (SMaRC)   **Stockholm, Sweden**
SD2709 Underwater Technology Attendee   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)   **Trondheim, Norway**
Seabed Survey Research Student   Jan. 2019 – Jun. 2019
- Studied the seabed sensing survey equipment, such as LAUV Fridtjøf 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
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

PROFESSINOAL 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:
Hedvig Kjellström   Dept. of Intelligent Systems, KTH
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Martin Ludvigsen   Dept. of Marine Technology, NTNU
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