Chang Shu

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 github | website

SUMMARY

Master student in Electrical and Computer Engineering at KAUST. Interested in reinforcement learning, task planning for robotics, and combinatorial optimization.

EDUCATION

King Abdullah University of Science and Technology   *2021 - 2023 (expected)*

M.S in Electrical and Computer Engineering

• GPA: 3.78 / 4.00
• Relevant Courses: Linear Control Systems (A), Numerical Optimization (A), Cyber-Physical Systems (A), Stochastic Processes (A-), Applied Mathematics (A), Digital Communication and Coding, Geometry Processing (ongoing)

University of Electronic Science and Technology of China   *2017 - 2021*

Joint B.Eng in Electronic Information Engineering

• GPA: 3.78 / 4.00 (overall ranking: 3 / 257)

University of Glasgow   *2017 - 2021*

Joint B.Eng in Electronics & Electrical Engineering

• Awarded with the First Class Honours
• Relevant Courses: Linear Algebra (A3), Probability Theory and Mathematical Statistics (A2), Dynamics and Control (A5), Signals and Systems (A3), Digital Signal Processing (A5), Digital Communication (A4)

ACADEMIC EXPERIENCE

Learning Generalizable Policies for Assembly Sequence Planning [github]   *Jan. 2022 - present*

Master Thesis Project, Advisor: Shinkyu Park, KAUST

• Formulate the robot assembly sequencing as a combinatorial optimization problem over graph and solve it with a generalizable graph-based reinforcement learning framework

• Build a physics simulation environment to generate feasibility constraints, i.e., interference matrices and stability matrices, of the assembly objects with PyBullet

• Implement the graph neural networks to encode the state of the environment and build the reinforcement learning algorithm to learn a task and motion planner for the assembly sequence planning

Exploiting Time Series for Human Activity Recognition with Radar [github]   *Oct. 2020 - May. 2021*

Undergraduate Final Year Project, Advisor: Julien Le Kernec, University of Glasgow

• Extracted radar features in multiple domains, i.e., range profiles and micro-Doppler spectrograms, from raw radar data of several human activities for the classification task

• Implemented the Bi-LSTM network to leverage the long-term dependencies in radar features from both the past and the future with PyTorch

• Presented a detailed evaluation of using recurrent neural networks on radar features in different domains, highlighting the influence range and speed of human activities have on the classification result

SemMed Knowledge Graph for Interpreting Predictive Models [github]   *Apr. 2020 - Aug. 2020*

Research Assistance, Advisor: Fenglong Ma, Pennsylvania State University

• Incorporated the SemMed, a medical knowledge graph, to improve the interpretability of deep learning models in healthcare by utilizing the paths on graphs of patients' medical records to indicate potential medical factors that contribute to the incidence of a specific disease

• Formulated the task as a question-answering problem and adopted a knowledge-ware graph network for commonsense reasoning (KagNet) to query causes of disease

• Preprocessed the medical data by mapping the medical records of patients to subgraphs of the SemMed knowledge graph and pretrained the node and relation embeddings with the OpenKE framework

Autonomous Mobile Robot Design in Webots [⌾ github]   *Mar. 2020 - Jun. 2020*

Team Design Project, Advisor: Wasim Ahmad, University of Glasgow

• We developed a rover in Webots that was able to perform a set of given tasks, including path-following, bridge-crossing, color detection, gripper control, etc

• Implemented perceptual algorithms, including beacon detection, color recognition, and edge detection with OpenCV

Complex Domain Feature Fusion for Human Activity Recognition with Radar   *Aug. 2019 - Mar. 2020*

Research Assistance, Advisor: Julien Le Kernec, University of Glasgow

• Proposed a fusion network that aggregated the magnitude and phase information from complex domain radar features

• Constructed the range-Doppler-time point cloud from the micro-Doppler signature and extracted the phase map from the complex domain range profile

• Implemented a deep learning model for point cloud classification (PointNet) and combined it with a convolutional model (PhaseNet) using the deep fusion scheme with Tensorflow

TEACHING EXPERIENCE

Linear Control Systems   *2022 Fall*

Teaching Assistant, KAUST

Digital Image Processing   *2019 Fall*

Teaching Assistant, GEC Academy

HONORS & AWARDS

Outstanding Graduate Award, Sichuan Province   *2021*

Awarded to outstanding graduates in Sichuan Province, Top 2%

China National Scholarship   *2020*

Highest scholarship given by Chinese government, Top 0.2%

Meritorious Winner Award, Interdisciplinary Contest in Modeling   *2019*

Awarded to winners of the contest, Top 8%

Glasgow College Academic Scholarship, UESTC   *2018 & 2020*

Awarded to students with excellent academic performance, Top 5%

Excellent Student Scholarships, UESTC   *2018 & 2019 & 2020*

Awarded to students with excellent performance, Top 10%

PUBLICATION

Guo Jiaqi, **Shu Chang**, Zhou Yiyi, Wang Kun, Fioranelli Francesco, Romain Olivier and Julien Le Kernec, *Complex Field-based Fusion Network for Human Activities Classification with Radar*, IET International Radar Conference

LEADERSHIP

The 16th Sino-Singapore Undergraduate Exchange Program   *Jul. 2019 - Aug. 2019*

Student Representative

• Attended academic lectures at participating universities, visited government organizations and private companies in Singapore and explored aspects of Singapore life, education and culture

• Organized and participated in academic and daily activities during Singaporean participants' stay in China

SKILLS

PROGRAMMING LANGUAGES	C ∣ Python ∣ MATLAB ∣ R ∣ Bash ∣ LaTeX ∣ Verilog
FRAMEWORKS & LIBRARIES	PyTorch ∣ Tensorflow ∣ Keras ∣ PyG ∣ PyBullet ∣ Gym ∣ OpenCV ∣ OpenMesh ∣ SciPy
LANGUAGES	TOEFL: L 29 R 26 W 24 S 24 ∣ GRE: V 159 Q 170 AW 3