

Chuanhao Li

Rice 224, University of Virginia, Charlottesville, VA 22904
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SKILLS

Programming	Python, Java, C/C++, MATLAB, LaTeX, TensorFlow/Keras, ROS
Mathematics	Linear Algebra, Probability & Statistics, Concentration Inequalities Statistical Hypothesis Testing, Probabilistic Graphical Models Convex Optimization, Tensor Decomposition
Machine Learning	Machine learning, Deep Neural Networks, Multi-armed bandits, Reinforcement Learning

EDUCATION

University of Virginia, Charlottesville, US *Aug 2018 - Now*

PhD student in Computer Science

Courses: Convex Optimization, Autonomous Mobile Robots, Statistical Learning & Graphical Models, Tensor Decomposition, Text Mining, Learning & Game Theory

Harbin Institute of Technology, Harbin, China *June 2018*

MS in Mechatronics Engineering

GPA: 86/100, rank: 4/34

Courses: Robotics, Deep Learning, Computer Control of Mechatronics Systems, Control Theory, System Modeling and Simulation, Numerical Analysis, Digital Signal Processing

Harbin Institute of Technology, Harbin, China *June 2016*

BA in English & BS in Mechanical Engineering

GPA: 92.86 & 83.51/100, rank: 1/14

Monash University, Melbourne, Australia *July 2015*

Exchange Student

GPA: 3.5/4

RESEARCH EXPERIENCE

School of Engineering and Applied Science, University of Virginia (UVA)

Graduate Research Assistant

Winter 2018 - present

Advisor: Prof. Hongning Wang

Online Clustering of Non-stationary Bandits

- Formulated a new bandit problem that learner interacts with an environment consisting of multiple users, each with non-stationary reward distribution and clustering structure exists among users
- Designed an algorithm that detects change in user's reward distribution and reinitializes user model accordingly, and when selecting arm, reuses past observations by clustering existing user models, and validated its performance via regret analysis and experiments on synthetic and real-world recommendation dataset

(Submitted)

Graduate Research Assistant

Fall 2018 – Winter 2018

Advisor: Prof. Feng Lu

Sequential Decision Making with Constraints with Application to Robotics

- Formulated a robot search and rescue mission (search for targets while avoiding obstacles and saving fuel) as a Partially Observable Markov Decision Process (POMDP) with constraints
- Applied Monte Carlo Tree Search to solve the constrained POMDP problem online so that the robot can plan next move at decision time and validated the effectiveness of the algorithm in simulation

School of Mechatronics Engineering, Harbin Institute of Technology (HIT)

Graduate Research Assistant

Spring 2016 – Summer 2018

Advisor: Prof. Gaoliang Peng and Prof. Shaohui Liu

RGBD Based Planar Robot Grasp Pose Detection

- Built a simulation environment in Gazebo for grasp planning algorithm using RGBD image, and designed a pipeline to collect and automatically label data as simulated robot tries to grasp object using a heuristic grasp planning method
- Designed several convolutional-neural-network-based algorithms to plan and execute grasps for the robot manipulator, trained using the data generated by simulation, and validated its performance through real world experiments

Data-driven Bearing Health Monitoring

- Designed a convolutional neural network model for diagnosing bearing fault categories with raw vibrations signal as input, applied a winner-take-all training method for autoencoder to cope with the noise in vibrations signals
- Applied domain adaptation methods like maximum mean discrepancy and adversarial loss to cope with the variations in signals due to changing working conditions
- Designed a semi-supervised variational autoencoder model to reduce reliance on labeled signals

(Published in IEEE Access 2017, Sensors 2017, MSSP 2018)

Connected Driving Experience Research Group, General Motors China Science Lab

Research Intern

Summer 2017

Manager: Dr. Xiaowen Dai, Lab Director: Dr. Jiangling Du

Visual Scene Understanding for Autonomous Vehicles

- Applied a generative model (based on DCGAN) with perceptual loss for image compression
- Implemented an instance segmentation model Mask-RCNN and tried to reproduce the results claimed in the paper, and then applied it to segment road scene images

PUBLICATIONS

- **Li, C.**, Zhang, W.E.I., Peng, G. and Liu, S., 2017. Bearing fault diagnosis using fully-connected winner-take-all autoencoder. IEEE Access, 6, pp.6103-6115. (IF 4.098, Citations 30)
- Zhang, W., **Li, C.**, Peng, G., Chen, Y. and Zhang, Z., 2018. A deep convolutional neural network with new training methods for bearing fault diagnosis under noisy environment

and different working load. Mechanical Systems and Signal Processing, 100, pp.439-453. (IF 5.005, Citations 181)

- Zhang, W., Peng, G., **Li, C.**, Chen, Y. and Zhang, Z., 2017. A new deep learning model for fault diagnosis with good anti-noise and domain adaptation ability on raw vibration signals. Sensors, 17(2), p.425. (IF 3.031, Citations 176)
- Peng, G., Sun, Y., Han, R. and **Li, C.**, 2016. An automated assembly technology for large mobile radar antenna. Assembly Automation, 36(4), pp.429-438. (IF 2.056)
- Peng, G., Sun, Y., Han, R., **Li, C.** and Liu, S., 2016. A measuring method for large antenna assembly using laser and vision guiding technology. Measurement, 92, pp.400-412. (IF 2.791)

TEACHING

Teaching Assistant, Software Analysis and Applications

Spring 2020

Teaching Assistant, Data Structures and Algorithms I

Fall 2019