Kai **Lu**

"My dream is to make robots actively perceive and embrace the world."

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Education

Tsinghua University *Beijing, China*

B.E. IN AUTOMATION(ANTICIPATED) *Aug. 2016 - PRESENT*

- GPA: 85.5/100
- Core courses: Computer Languages and Programming, Computer Principles and Applications, Signals and System Analysis, Introduction to Artificial Intelligence, Digital Image Processing, Automatic Control Theory, Project of Electronic Circuits

Publications

Robot Grasping in Cluttered Environment with Active Exploration *IROS, 2019, submitted.*

CO-FIRST AUTHOR *Mar, 2019*

- **Kai Lu***,Yuhong Deng*, Xiaofeng Guo*, Yixuan Wei*, Bin Fang, Di Guo, Fuchun Sun and Huaping Liu[†]

A Composite Robot Hand Based on Multi-Modal Perception *Patent, No.2018114158451, published.*

CO-FIRST AUTHOR *Mar 2019*

- **Kai Lu***,Yuhong Deng*, Xiaofeng Guo*, Yixuan Wei*, Bin Fang and Huaping Liu

Experience

RoboCup 2019 Humanoid League Contest (Preparing) *Sydney, Australia*

ADVISOR: A.P. MINGGUO ZHAO, DEPARTMENT OF AUTOMATION, TSINGHUA UNIVERSITY. *Sep 2018 - Present*

- My role: Main developer of the CV & CNN model training group. We use the darknet and yolo V3 to predict the robot actions.

Pocket Instrument Based on Internet of Things *Beijing, China*

ADVISOR: S.E. YANPIN REN, DEPARTMENT OF AUTOMATION, TSINGHUA UNIVERSITY. *Jun 2018 - Jul 2018*

- Prize winning project: "The best project of the class".
- A platform combining hardware and software was built to realize the miniaturization of oscilloscope and sensor instrument. The hardware (STM32) was multifunctional. An app was developed to Android and IOS.
- My role: Team leader.

Robot Grasping in Cluttered Environment with Active Exploration *Beijing, China*

ADVISOR: A.P. HUAPING LIU, STATE KEY LABORATORY OF INTELLIGENT TECHNOLOGY AND SYSTEMS. *Mar 2018 - Mar 2019*

- Designed a novel composite robotic hand combining a suction cup and a gripper.
- Proposed an active exploration algorithm which employs the deep Q-Network (DQN) to facilitate the robot to actively explore the environment until a good operating position was generated.
- Integrated the composite hand and the active exploration algorithm. It had a superior performance when grasping objects in a real cluttered environment. Submitted a paper of the system.
- My role: The co-developer of our CNN and DQN models, and the only designer of the robot control circuit and algorithm.

Compound Grasping Robot Based on Multi-modal Perception *Beijing, China*

ADVISOR: A.P. HUAPING LIU, DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY, TSINGHUA UNIVERSITY. *Apr 2017 - Mar 2018*

- We won 1st prize in NRAI Competition 2018 and we submitted a patent.
- Designed a composite robotic hand which could compound operations.
- Developed a multi-modal-perception algorithm of vision and tactile and an electronic circuit board independently.
- My role:The main developer of robot vision & tactile sensation.

Honors & Awards

2019	**A-level Project (The best level)**, Academic Promotion Program		*Tsinghua University*
2018	**1st Place**, 20th National Robotics and Artificial Intelligence Competition (NRAI Competition)		*Foshan,China*
2017	**Student Representative**, HAGE Self-Reliant Encouragement Scholarship		*Tsinghua University*
2017	**Best Volunteer**, Supported Education Program to Mountainous Area		*Guizhou, China*

Skills

Machine Learning	Python, C/C++/C#/QT, MATLAB, Torch, Pytorch, TensorFlow,Darknet/Yolo
Robot Related	ROS, V-REP, Universal Robot(UR), Kinect, STM32/Arduino