# Ruochu Yang

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## Education

**Georgia Institute of Technology | Atlanta, GA** *01 2020 – Present*
M.S. in Electrical and Computer Engineering, GPA: **4.0**/4.0 Expected: *06 2022*

**Nankai University | Tianjin, China** *09 2015 – 06 2019*
B.Eng. in Automation, GPA: **88**/100

**Scholarship:** "Gong Neng" scholarship of Nankai University, "Excellent Undergraduate" of Nankai University

## Work Experience

**AV Development | *Intern, Cruise LLC*** *02 2021 – Present*

- Develop the test cases of A100/A110 autonomous vehicle product-level requirements and analyze the test results
- Integrate RIEDON current shunt, Arduino Uno board and AD8215 shunt monitor to display the voltage of compute system
- Research the power mode interaction workflow between the AV compute system and the power distribution board
- Research a Python-based unified API to remotely turn on multiple power supplies on component test benches

**Algorithm design of visual SLAM | *Research Assistant, Nankai University*** *12 2018 – 12 2019*

- Based on LSD-SLAM algorithm, design an improved ORB-SLAM algorithm to promote the accuracy of robot pose estimation and 3D virtual map construction
- Improve the original ORB-SLAM to run robustly in challenging indoor scenes such as texture loss and motion blur
- Based on ORB-SLAM algorithm, write C++ code modules to extract two or three principal planes from a 3D dense point cloud to recover depths of the projected 2D points

## Selected Projects

**Iterative methods of linear and nonlinear systems** *04 – 05 2020*

- Based on CG and PCG iterative methods, design an FFT algorithm to accelerate the floating-point operation in solving high-dimensional linear equations, and reduce the overall computation runtime complexity to *O(nlogn)*
- Use Newton and Quasi-Newton methods to solve high-dimensional dense matrix, and combine them with linear iterative methods to search possible solutions in the three-dimensional space

**Design of image retrieval system | *Group Leader*** *07 – 08 2018*

- Decode and pre-process images, convert to HSI mode, filter Gaussian noise, and enhance bad illumination
- Given a target image, implement a global-local feature detection function on back end to retrieve 10 similar images from database of 1000 samples in 3 seconds
- Design a user interface on front end to show the target image, retrieved images, and processing time for evaluation

**TRS robot project | *Group Leader*** *02 – 03 2018*

- Set up the simulation environment in V-rep, and implement robot path planning through MATLAB's remote interface
- Based on visual recognition, control the robot to pick up specified objects and put them into specified trash cans

**Innovation research project** *03 2017 – 10 2018*

- According to the working principles of practical cranes, establish a complete flexible crane experiment system, including mechanical body, driving device, measuring device and control system
- Obtain a nonlinear relationship between top angle and end angle of the rope through combination of computer vision and machine learning to quantitatively evaluate performance of various automatic control strategies

## Publication

**Ruochu Yang**, C. Jiang, Y. Miao, etc., *A Flexible Rope Crane Experiment System*, Applications of Modeling and Simulation. (AMS), ISSN: 2680-8084, in English (published)

## Skills

**Programming:** C++, Python, MATLAB
**Platforms:** Linux
**Software:** MATLAB/Simulink, Robot Studio, Xcode, V-rep

## Relevant Coursework

Robotics, Control Robotic System, Computer Vision, Statistical Machine Learning, Modeling and Pattern Recognition, Signal Analysis, Advanced C++ Programming, Data Structure & Algorithm, Iterative Methods & System Equations