Qiong Hu
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EDUCATION

BS in Physics, Fudan University, Shanghai, P. R. China   Expected: Jun 2019
- GPA: Overall 3.84/4.0   Ranking: **1/101**
- Related courses: Introduction to Robotics (4.0/4.0), Mechanics (4.0/4.0), Aeronautic and Astronautic Technologies (4.0/4.0). Currently taking: Artificial Intelligence, Computer Graphics, Machine Learning.

Exchange student in Physics, University of California, Los Angeles, USA   Sep – Dec 2017
- GPA: **4.0/4.0**
- Related courses: Introduction to Electrical Engineering (4.0/4.0), Internet of Things (4.0/4.0).

Standard Tests   **TOEFL** 110/120   Reading: 29 Listening: 27 Speaking: 26 Writing: 28
                        GRE 326/340 + 3.5/6.0   Verbal: 156 (73%) Quantitative: 170 (96%)

RESEARCH EXPERIENCE

Project: FAVECAD System for Robotic Design   Jun – Oct 2018
Advisor: Professor Ankur Mehta, Electrical and Computer Engineering Department, UCLA
- Constructed VR hardware and program, implemented in Unity totaling to about 3000 lines of C#.
- Defined intuitive 3D finger gestures for sensors on VR gloves to detect motion and wrote an API to connect different hardware to the same backend compiler.
- Used Photon Server for collaborative robotic design between AR and VR, allowing visual and audio communication between designers.
- Paper submitted to Proceedings of ACM SIGCHI Conference (CHI '19) and under review.

Project: Thin-edge Detection in 2D Material hBN   Jul 2016 – Jun 2018
Advisor: Professor Yuanbo Zhang, Physics Department, Fudan University (supported by FDUROP)
- Converted RGB color space to HSB space and grayscale for later use. Also tested program in YUV space and HSL space. All implemented in MATLAB.
- Used computer graphics and mathematical morphology techniques such as dilation, erosion, opening, and closing to preprocess images.
- Calculated histogram of information entropy and a threshold function to detect thin edges with low contrast between sample and substrate.
- My method proved to be more effective than Roberts Algorithm, Sobel Algorithm, Prewitt Algorithm, Kirsch Algorithm, Canny Algorithm, Laplace Algorithm, and LoG Algorithm.

ACTIVITIES & COURSE PROJECTS

Project: Choreography of Metal-Fighter Robots   Mar – Jun 2018
Advisor: Professor Wenqiang Zhang, Computer Science Department, Fudan University
- Wrote about 60 functions and 4000 lines of language ROBOBASIC2.0 in software RoboBasic MF to program a 3-min dance for two metal-fighter robots with MR-C3024FX micro-controllers.
- Managed to keep robots balanced when giving commands to 16 motors in the robots' joints despite one motor malfunctioning.
- Self-explored musical implementation with a lack of documentation.
- Received one of the highest scores among all the groups.

Project: Electrical Bouncing Ball Game   Mar – Jun 2018
Advisor: Professor Xi Yu, Physics Department, Fudan University
- Wrote >1000 lines in Arduino for a mini competing bouncing ball game with ten levels of difficulty.
- Hardware includes an Arduino Meta microcontroller, two 8-by-8 LED matrices, two rotating resistors, a single-digit seven-segment displayer, and more than 60 wires.
- Players adjust rotating resistors to control the movement of their boards (represented by two to

three continuant LED lights) to prevent bouncing balls (represented by an LED light that shifts quickly) from falling to the ground, and bumping towards their opponents.

Project: Path-following Mobile Robot   Sep – Dec 2017

Advisor: Professor Dennis M. Briggs, Electrical and Computer Engineering Department, UCLA

➢ Used Arduino Nano micro-controller board, two pairs of infrared LEDs and photo-transistors for path sensing, an EE-SX1042 phototransistor for wheel speed sensing, a TIP120 transistor for motor control, and three LEDs for signal feedback.

➢ Wrote about 800 lines of the control program in Arduino using a differential controlling algorithm and ran repeated tests to find appropriate sensor threshold values.

➢ The mobile car finished its 19 ft-long track in 30 seconds with an autonomous stop at the end and performed an auto-kick to restart itself when its wheel stopped before the end.

Project: Motion-Signaled Morse Code Translation System   Sep – Dec 2017

Advisor: Professor William J. Kaiser, Electrical and Computer Engineering Department, UCLA

➢ Wrote 188 lines of the main function in C on Eclipse for STM32 SensorTile kit and Nucleo Board.

➢ Applied a low pass filter to encode slow small-scale rotary motion of the SensorTile as a dot and quick large-amplitude rotation as a dash.

➢ The system recognized movements and completed translation in real-time.

Project: Traffic Congestion Model   Sep 2016

Physics Department, Fudan University

➢ Wrote about 800 lines in MATLAB to create a model describing the relationship between road layout and congestion.

➢ Used cellular automata algorithms and predefined line up rules to simulate car behavior and average traffic speed to measure congestion levels, resulting in a conclusion that more available road will not necessarily decrease congestion, and recommended two of road layouts.

➢ Submitted to 2016 Mathematical Modeling Contest, and won the Third Prize in Shanghai.

PUBLICATION

1. Cheuk Yin Phipson Lee, **Qiong Hu**, Wenzhong Yan, Xiang "Anthony" Chen, Ankur Mehta, "FAVECAD: An Interactive Environment for Generating Fabricable Designs in both AR and VR", *CHI 2019*, under review.
2. Zezheng Xiong, **Qiong Hu**, "The Extension of Kubo Equation in Quantum Mechanics", *Chinese Mathematic Learning and Research Journal,* 2018.02(3).
3. Zezheng Xiong, **Qiong Hu**, "A Law of Convergence Extended by a Series Problem", *Chinese Mathematic Learning and Research Journal*, 2018.01(1).

HONORS AND AWARDS

1. *2018 National Web Security Challenge Competition.* **First Price**   Mar 2018
2. *China Government Scholarship*. One of ten winners in the university.   May 2017
3. The *33rd National Physics Contest* (Professional Group, Shanghai). **Second Prize**   Dec 2016
4. The *8th National Mathematical Contest* (Shanghai). **Second Prize**   Oct 2016
5. *2016 HEPC National Mathematical Modeling Contest* (Shanghai). **Third Prize**   Oct 2016
6. *National Scholarship*. Won as the **top** student in the department.   Sep 2016

SKILLS & OTHERS

➢ Proficient in Python, C#/C, Mathematica, MATLAB, Unity, Origin, LabVIEW, Arduino. Frequent user of TensorFlow, Inkscape. Occasional user of Eclipse, Quartus, SolidWorks, FPGA, ROS.

➢ Instrumentation: Atomic Force Microscope, InSb magneto-resistive sensor, γ-ray spectrometer, GaAs Hall probe, X-ray diffraction and spectroscopy, Michelson interferometer, and more.