Pengzhi Yang

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EDUCATION

University of Electronic Science and Technology of China (UESTC) **Chengdu, China**
Yingcai Honors College (Elite School of Top 2% Student)
B. Eng. of Computer Science & Engineering ***09/2016 - 06/2020***

- Overall GPA: 3.9/4.0

University of California, Santa Barbara (UCSB) **Santa Barbara, US**
Extension Program in Computer Science ***03 - 06/2019***

- Overall GPA: 4.0/4.0

GRE: Verbal 156/ Quantity 170/ AW 4.0
TOEFL: Reading 27/ Listening 26/ Speaking 25/ Writing 25/ Total 103

PUBLICATION

Pengzhi Yang, Jiahao Liu, Hongchun Yang, Shaoyi Wu, Baohua Teng. **Magnetic Field Energy of Two Parallel Current-carrying Straight Wires**[J]. **Physics Bulletin**. 2019(7): 9-13.

Pengzhi Yang, Monika Roznere, Zhe Tang, Wen Li, Alberto Quattrini Li, **Underwater Monocular-Based Collision Free Navigation using Deep Reinforcement Learning**. Paper in Preparation.

INTERNSHIP

Robotics X, Tencent **Shenzhen, China**

Robotics X, established in Shenzhen in 2018, is dedicated to the research and applied use of cutting-edge robotics technologies, as well as exploring the connection of the virtual and physical worlds.

Research Intern*, Mentor: Dr. Cheng Zhou** ***12/2020 – 08/2021

- **End-to-End Control for Quadruped Robot with Learning-based Methods**
  - Implementing reinforcement and imitation learning algorithms to train a quadruped robot to walk in Pybullet.
  - By applying domain adaptation: predicting dynamic parameters (friction, robot's mass and etc.) during interaction with environments to give an adaptive walking policy in Gazebo and real-world to eliminate sim-to-real gap.
  - Using multi-processing method and C++ deep learning codes to improve algorithms' running efficiency during training and deployment.

RESEARCH EXPERIENCES&ACADEMIC PROJECTS

Dartmouth Reality and Robotics Lab, Dartmouth College **Hanover, US**

Research group directed by A. P. Alberto Quattrini Li from Dartmouth College, studying topics at the intersection of computing and physical reality, including robotics, 3D fabrication, sensing and augmented reality.

Undergraduate Research Assistant*, Advisor: A. P. Alberto Quattrini Li** ***06/2019 - present

- **Underwater Robot Navigation**
  - Compared Fully Convolutional Residual Network (FCRN) and MegaDepth-trained CNN to predict underwater depth images (RGBD) after retrained with monocular RGB images using NYU dataset (synthesized to have underwater features).
  - Trained the Dueling Double Deep Q network (D3QN) with depth images and relative goal positions in well-designed Gazebo worlds to navigate the robot to the waypoints while avoiding nearby obstacles.
  - Compared the proposed system with other underwater navigation algorithms like Bug2 to show its best overall performance. Conducted the experiments in both Underwater Simulator (UWSim) and the real world (pool environment).

Compiler for Simplified C++, UCSB **Santa Barbara, US**
Advisor: A. P. Yufei Ding ***04 - 06/2019***

- Course project of Translation of Programming Languages (CS160). The 6 projects included scanner, parser, Abstract Syntax Tree (AST), type checking and code generation.
- The test cases were parsed successfully with no errors and valid X86 assembly codes were generated. Got an A+ at last.

Center for Robotics, UESTC **Chengdu, China**

Directed by Prof. Shuzhi Ge from NUS, working on autonomous robotics, intelligence control, intelligent interactive media fusion, and education software development.

Undergraduate Research Assistant, Advisor: Prof. Shuzhi Ge ***11/2019 - 06/2020***

- **Project on Robot Indoor Localization**
  - Changed ACS files to create required VizDoom Environments: discretized agent's actions and built APIs for interaction.
  - Implemented "Active Neural Localizer" with A3C algorithm in the mazes based on Bayesian Filter with created worlds.
  - Adjusted the Perception Model in 3D environment (used distances as inputs rather than images) to make the system more applicable in real-world environments.

Academic Projects, UESTC **Chengdu, China**

Undergraduate Research Assistant, Advisor: Prof. Baohua Teng ***03/2018 - 01/2019***

- **Research on Energy of Magnetic Field of an Ideal Physical Model** (Paper published on *Physics Bulletin*)
  - Calculated the energy density distribution of magnetic field in two parallel long current-carrying straight wires based on the principle of vector synthesis of magnetic induction intensity.
  - Simulated the magnetic field distribution and total magnetic energy curves under different current directions and different wire distances, gave a reasonable and intuitive theoretical description of the problem.
  - Published the research as the **first author** on *Physics Bulletin*

Advisor: Prof. Jianhao Hu ***04 - 07/2018***

- **Development of an Eight-Stage Pipelined MIPS Processor**
  - Implemented a 32-bit CPU based on gate-level circuits in Verilog, containing main parts of a fully functional pipelined CPU.
  - Devised and embedded deep pipeline into the Algorithm Logical Unit (ALU) part. Implemented optimized Fast Fourier Transform Algorithm (FFT) on the processor in the simulation environment and tested the whole project on FPGA.
  - Won **1st place** in the Efficiency Competition amongst all teams.

Team Leader, Advisor: Senior Engineer Xiaoning Li ***03 - 09/2018***

- **An Innovative Practical Mini Catamaran**
  - Designed the catamaran in SolidWorks and 3D printed it. With infrared control, it was able to accomplish simple tasks such as water surface refuse collection.
  - Completed the business plan for the project. The project was awarded as **Excellence (top 10%)** in the **College Students Innovation and Entrepreneurship Competition** (2018) of UESTC.

SKILLS

- **Programming Languages:** Python, C, C++, Verilog, MATLAB.
- **Expertise:** Circuit Design (Vivado and Multisim), Robotics Tools (ROS, Gazebo, Pybullet, UWSim and QGroundControl), Mathematics Tools (Mathcad and MathType), Industrial Design and Simulation (Flotherm and SolidWorks), Multimedia Production (Adobe Illustrator, InDesign, Lightroom and Premier), other Software Tools (Latex, MobaXterm, Wireshark and Jupyter Notebook).

HONORS&AWARDS

- 1st Merit Student Scholarship in UESTC (top 8%). ***09/2018***
- 2nd Merit Student Scholarship in UESTC (top 15%). ***09/2017, 10/2019***
- Shiqiang Scholarship (top 5%). ***10/2018***
- Second prize of English Speech Contest in UESTC. ***06/2018***
- Awarded Outstanding Volunteer. ***10/2017***

OTHERS

- **Head of Weiai Volunteering Education Team**
  - Organized volunteering activities as the team leader in Zhongjiang County, Sichuan for 13 months. Was responsible for managing donation, curriculum arrangement as well as team members' accommodation in rural areas.
  - Taught students Chinese poems and history during the summer in 2017.
- **Short Internship at H.K. Insurance Company:** Drew up an insurance service plan for a specific case from the Manulife Financial Corporation in Hong Kong. Received Excellence Award and our team won **2nd place**.
- **Personal Hobbies:** Handcrafting, traveling, swimming, photography (https://500px.com/y_marcus), biking, diving (got Open Water Certificate) and movies.