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| **Webpage:** [**pengzhi1998.com**](http://pengzhi1998.com/) | **Github:** [**https://github.com/pengzhi1998**](https://github.com/pengzhi1998) |

# **EDUCATION**

**University of Electronic Science and Technology of China (UESTC)**  **Chengdu, China**

*B. Eng. of Computer Science,* *Yingcai Honors College (Elite School of Top 2% Student), GPA: 3.9/4.0 Sep. 2016 – Jun.2020*

**University of California, Santa Barbara (UCSB)**  **Santa Barbara, US**

*Extension Program in Computer Science, GPA: 4.0/4.0 Mar. – Jun. 2019*

**Programming**: Python, C/C++, Matlab, XML, Shell, Verilog, SQL

**Skills**: Pytorch, Tensorflow; Git, Docker, Jupyter Notebook; ROS, Gazebo, Pybullet, UWSim, VizDoom, SolidWorks; Adobe Softwares

**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**](http://wltb.cnjournals.com/ch/reader/create_pdf.aspx?file_no=20181649&flag=1&journal_id=wltb&year_id=2019)**[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.

# **RESEARCH EXPERIENCE**

**Robotics X, Tencent Dec. 2020 – Aug. 2021**

*Machine Learning Intern Shenzhen, China*

* **End-to-End Control for Quadruped Robot with Learning-based Methods**
* Trained a deep reinforcement learning (PPO) model with reference motions to control a quadruped robot, *Max*, to walk in Pybullet.
* Applied Domain Randomization by randomizing dynamic parameters (friction, robot’s mass and etc.) during training. Successfully transferred the model to **Gazebo and real-world environments**.
* Introduced domain adaptation: predicting dynamic parameters using sequences of *Max*’s *state*, *action* data in Pybullet. Fed the predicted parameters for the PPO network and computed more adaptable control policies for *Max*’s locomotion. Obtained a **5.09%** higher average reward in various environments in Gazebo compared with Robust DRL controller.
* Deployed the code in **Tencent TLeague Framework**, and nearly **five times** accelerated the training speed. During testing, realized a faster real-time control with **C++ deep learning codes (Eigen)**.

**Dartmouth Reality and Robotics Lab, Dartmouth College Jun. 2019 - Present**

*Research Assistant*  *Hanover, US*

* **[Underwater Robot Navigation](https://github.com/pengzhi1998/Underwater-obstacle-avoidance)**
* Synthesized *NYU Depth Dataset*’s RGB images with **underwater features**. Retrained the depth (RGB-D) prediction network with the rendered images and better estimated single-view underwater distance information with a **monocular camera**.
* Proposed **a novel end-to-end DRL (D3QN) navigation controller**: integrating predicted depth images, single beam sonar’s readings, and GPS for an Autonomous Underwater Vehicle (AUV) to navigate to goal positions while avoiding nearby obstacles.
* Compared existing depth estimation methods, and adopted MegaDepth-trained Hourglass Network which averagely saved **28.27%** of the navigation time. Equipped with only a cheap monocular camera and single beam sonar, our approach achieved **30.97%** higher efficiency than traditional navigators using a multibeam echo sounder (like Bug2).
* Conducted **field experiments** in a swimming pool and showed its robustness and adaptability in real-world.

**Center for Robotics, UESTC Nov. 2019 – Jun. 2020**

*Undergraduate Research Assistant*   *Chengdu, China*

* **Robot Indoor Localization**
* Modified ACS files to create VizDoom Mazes with required behaviors: discretized agent’s actions and built APIs for interaction.
* Implemented *Active Neural Localizer* with A3C algorithm in the created mazes based on Bayesian Filter.
* Adjusted the Perception Model in 3D environment (used distances as inputs rather than images) and facilitated the system’s **practical application**.

# **SELECTED PROJECTS**

* **Compiler for Simplified C++, UCSB Apr. – Jun. 2019**
* Completed a simplified compiler using C++, including Scanner, Parser, Abstract Syntax Tree, Type Checking and Code Generation.
* Got an **A+** at last.
* **Development of an Eight-Stage Pipelined MIPS Processor, UESTC Apr. – Jun. 2018**
* Built a 32-bit CPU based on gate-level circuits; embedded deep pipeline into its ALU module; ran FFT on this simulated processor.
* Won **1st place** in the Efficiency Competition amongst all teams.

# **HONORS&AWARDS**

Shiqiang Scholarship (top 1%); 1st, 2nd Merit Student Scholarship in UESTC (top 5%).