Jiacong Xu

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Education

Texas A&M University (TAMU) — Collge Station, TX
Master of Science in Electrical Engineering — *Aug 2019 – Dec 2021*

University of Sci. & Tech. of China (USTC) — Hefei, P.R.China
Bachelor of Engineering in Mechanical Engineering — *Sep 2015 – Jun 2019*

Research

Real-Time & Accurate Semantic Segmentation[1]
Supervised by Prof. Zixiang Xiong, TAMU — *Jan 2022 – Jun 2022*

- Boundary branch to mitigate the overshoot issue of two-branch models
- State-of-art results for real-time semantic segmentation (**Ranking**)

Control for Optimization & Optimization for Control[2,3]
Supervised by Prof. Shankar P. Bhattacharyya, TAMU — *Jan 2021 – Dec 2021*

- An analogy between control system and optimization process
- Improvement of PSO on convergence speed and optimization accuracy
- Application on online tunning of PID controller for dynamic systems

Simulation & Design of Optical Gas Sensor
Supervised by Prof. Keyi Wang and A/Prof Zhigang Liu, USTC — *Oct 2018 – Apr 2019*

- Numerical simulation of experiments for optical sensing system
- A high-sensitivity sensors to detect the change of gas composition

Publication

[1]PIDNet: A Real-time Semantic Segmentation Network Inspired from PID Controller
***Jiacong Xu**, Zixiang Xiong and Shankar P. Bhattacharyya, arXiv*

[2]A PID Controller Architecture Inspired Enhancement to the PSO Algorithm
Jiacong Xu** and Shankar P. Bhattacharyya, FICC 2022, ***Best Student Paper*

[3]Efficient Tuning of PID Controllers using Swarm-based Optimization Algorithms
***Jiacong Xu** and Shankar P. Bhattacharyya, ICSC 2021*

Research Internship

Edge Detection of Electron Microscopic Images for 2D Materials
Supervised by A/Prof Yuerui Lu, Australian National University — *Jul 2018 – Sep 2018*

- Real-time FPGA and PC communication using UDP over 1000M Ethernet
- Hardware implementation of Sobel algorithm for edge detection

Course Projects

HredNet: Hign-Resolution Path Guided Encoder-Decoder Network | *Computer Vision*

- Combination of the concepts of dual-path and encoder-decoder architectures
- 77.7 mIOU on Cityscapes Val with inference speed of 8ms on RTX 3090

Attack Detection for Malicious Programs | *Machine Learning*

- A simple decision tree model to handle different kinds of malicious programs
- Demonstration of its superiority over other advanced or complex ML models

Interests

Robotics, Computer Vision, Optimization & Control

Background and Skills

Mathematics & Statistics: Stochastic Processes, Theory of Linear Model, Equation of Mathematical Physics, Function of Complex Variable, Mathematical Statistics, Computational Mehthods

Programming: C/C++, Python, Verilog HDL, MATLAB, LabVIEW, JavaScript
Library: mmdetection, detectron2, PaddlePaddle

Microcontroller: 80C51, STM32, Arduino and Raspberry Pi
FPGA: FIFO, PCIE, SDRAM/DDR3, SPI, I^2C, LVDS, JESD204B, VGA, USB3.0, HDMI, Ethernet, SFP/SFP+