Wentao **Shangguan**

ELECTRONIC AND SYSTEM ENGINEERING · WASHINGTON UNIVERSITY IN ST. LOUIS

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Education

Washington University in St. Louis   *St. Louis, US*
MSc IN ELECTRONIC AND SYSTEM ENGINEERING   *Jan. 2020 - Present*

- Advisor: Prof. Ulugbek Kamilov
- Member of Computational Imaging Group (CIG)
- Cumulative GPA: 3.9

Nanchang University   *Nanchang, China*
B.E. IN COMMUNICATION ENGINEERING   *Sep. 2015 - June. 2019*

- Advisor: Prof. Qiurong Yan
- Supervisor of Cognitive Radio and Sensor Network Undergraduate-Laboratory   *Sep. 2016 - June. 2019*

Skills & Research Interests

Programming	Python, Matlab, CUDA, C/C++, Java, HTML, PHP, JavaScript, Django, Verilog HDL, LaTeX
Software Skills	PyTorch, Tensorflow, OpenCV, Quartus, KEIL, Multisim
Others	FPGA, Full Stack Development, Analog Circuit Design, Switch Power Supply Design
Research Interests	Neural Fields Representation, Video Processing, Computational Imaging, Computer Vision, Optimization, Inverse Problem

Publications & Patents

PUBLICATIONS

- **Shangguan, W.**; Yan, Q.; Wang, H.; Yuan, C.; Li, B.; Wang, Y. Adaptive Single Photon Compressed Imaging Based on Constructing a Smart Threshold Matrix. *Sensors* 2018, 18, 3449. DOI: 10.3390/s18103449.

PATENTS

- **Wentao Shangguan**, A Kind of Self-powered Intelligent Protective Case, Patent No.: 201720014838.5.(CN)
- **Wentao Shangguan**, Sule Zhang, An Intelligent Separating Soldering Station, Patent No.:201820251464.3.(CN)

Working Experience

Shenzhen Institutes of Advanced Technology (SIAT), Chinese Academy of Science(CAS)   *Shenzhen, China*
CENTER FOR OPTOELECTRONIC ENGINEERING TECHNOLOGIES
Position: Research Assistant   *Mentor: Professor Jianping Li*   *Mar. 2019 - Dec. 2019*

- Assisted to develop a plankton imaging system for long time online in situ plankton monitoring and classifying, which is highly integrated, intelligent, and reliable.
- Helping establish our own image database of zooplankton and phytoplankton in Daya Bay Shenzhen China with our imaging system to train the neural network for classifying.
- Designed and built the hardware and software for an online chemical oxygen demand (COD) sensor based on a spectrophotometer for in situ monitoring seawater quality.
- Placed the COD sensor in Daya Bay, Shenzhen, China for two months, and maintain it regularly.
- Exhibited our Underwater Plankton Imaging System and online COD sensor in *2019 China Marine Economy Expo.*

Cognitive Radio and Sensor Network Undergraduate-Laboratory   *Shenzhen, China*
NANCHANG UNIVERSITY
Position: Supervisor   *Mentor: Dr. Yuhao Wang*   *Sep. 2016 - July. 2019*

- Gave lectures related to analog circuit design, and program design for switching power supply to the undergraduates.
- Designed some mini projects for those undergraduates
- Hired some ambitious undergraduates to our lab and introduced them to other professors who might have available research openings.

Research Projects

learning continuous representation for the single-molecule localization microscopy of 3D orientation and anisotropic wobble (Ongoing)

Lew lab, WUSTL

ADVISOR: MATTHEW LEW

Research Assistant

Spring 2022 - Present

- Learning the representation of 3D orientation and anisotropic wobble of the single-molecule.

Neural Video Representation(NeVR) for Video Frame Interpolation (Forming Paper)

CIG, WUSTL

ADVISOR: ULUGBEK KAMILOV, YU SUN

Goal: Representation discrete video frames with Continuous Neural Field Based Network.

Sep. 2020 - Present

- The first to propose a Neural Field (NF) Based Model NeVR for continuously representing the discrete video frames.
- NeVR is trained for video frame interpolation(VIF) task, which means synthesizing the intermediate frame in the two successive frames. It is the first NF-based video frame interpolation algorithm.
- Proved the importance for NF-Based neural representing of NeVR by ablation study.
- Experiments showed that NeVR achieves a good result. The relevant paper is being formed now.

Reconstruction Algorithm of Single Pixel Imaging based on Convolutional Neural Network (Capstone Project)

Nanchang University

MENTOR: PROFESSOR QIURONG YAN

Goal: To develop a novel reconstruction algorithm for Single Pixel Imaging (SPI) using convolutional neural networks (CNN).

Feb. 2019 - June. 2019

- Based on TensorFlow framework, proposed a model named CSCNN to reconstruct the image for SPI, which improves the reconstruction quality by about 1.25 times and cut down the reconstruction time from seconds to milliseconds.
- For the nature of SPI, built a dataset for training.
- Designed a new measurement matrix for DMD in the Single Pixel Camera according to the Neural Network.

Study on Single-Photon Compressed Imaging

Nanchang University

MENTOR: PROFESSOR QIURONG YAN

Goal: To propose an adaptive sampling algorithm for Single Photon Compressed Imaging, which improves its imaging quality

June. 2017 - Nov. 2018

- Proposed a novel adaptive sampling algorithm for Single Photon Compressed Imaging, in which I constructed an adaptive measurement matrix based on the coefficients of image in the sparse basis to improve the effect of Compressed Sensing theory.
- This algorithm has better image reconstruction quality even with 25 percent measurements and has higher anti-noise ability, proving that the system is fast and have higher sensitivity, which is suitable for imaging at extremely low light level.
- Conducted simulation and experiment to evaluate the method's availability.
- Published the result to *Sensors*. *[DOI: 10.3390/s18103449.]*

Development of a three phase inverter

Nanchang University

NATIONAL UNDERGRADUATE ELECTRONICS DESIGN CONTEST

Aug. 2017

- Designed the software for two DC-AC voltage stabilizing inverters, which converts 12 volts of direct current into 24V three-phase alternating current. Also, their outputs could be connected together with our algorithm.
- Designed voltage feedback module to increase load regulation and voltage regulation factor by using operational amplifier and ADC of STM32
- Designed and built auxiliary power supply (APS) based on TPS5430.
- Won the the second prize of Jiangxi Section.