Zhankun Luo

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OBJECTIVE

My research focuses on computer vision and I am interested in deep/machine learning based, data-driven algorithms.

EDUCATION

Purdue University West Lafayette — West Lafayette, IN
Ph.D. in Electrical and Computer Engineering — *Aug 2021 – Present*

Purdue University Northwest — Hammond, IN
Master in Electrical and Computer Engineering GPA 3.96/3.96 — *Aug 2019 – May 2021*

Beijing Institute of Technology — Beijing, China
Bachelor in Telecommunication Engineering — *Sept 2015 – Jun 2019*

RESEARCH EXPERIENCE

Computer Vision Techniques for Structured Light Vision Systems — Hammond, IN
Department of Electrical and Computer Engineering, Purdue University Northwest — *Sept 2019 – May 2021*
- Conducted experiments of 3D reconstruction with structured light method
- Developed framework for a structured light system with multiple cameras and multiple lasers
- Established a Multi-level RANSAC algorithm to tackle intersection points of the multiple laser planes
- Published and presented papers to the IEEE eit 2020 conference and the UEMCON 2020 conference
- Instructed and mentored three students for senior design on 3D reconstruction

Comparison of Capsule Networks and Other Networks for Object Segmentation — Hammond, IN
Department of Electrical and Computer Engineering, Purdue University Northwest — *Sept 2019 – Jan 2020*
- Customized CNN and compared performance of SegCap, DenseNet, and U-Net on DRIVE dataset for segmentation
- Examined performance of VideoCapsuleNet on the action recognition UCF101 dataset

Automated Fetal Brain Segmentation Using Deep Convolutional Neural Network — Hammond, IN
Department of Electrical and Computer Engineering, Purdue University Northwest — *Sept 2018 – Jan 2019*
- Manually labeled 2.8 thousand fetal brains from 30 to 33 weeks of 2139 images, 1900 images, and 2669 images for coronal, transverse, and sagittal MRI scans, respectively
- Implemented FPN, U-Net, WGAN architectures, and focal loss for automatic fetal brain segmentation
- The segmented slices of volume will further be used in autonomous fetus brain registration

WORK EXPERIENCE

Research Assistant — West Lafayette, IN
Video and Image Processing Laboratory (VIPER), Purdue University West Lafayette — *Aug 2021 – Present*
- Investigated reliable and effective methods for Fine-Grained Visual Classification (FGVC)
- Involved in developing an ios application for Technology Assisted Dietary Assessment (TADA)

Research Assistant — Hammond, IN
Center for Innovation through Visualization and Simulation (CIVS), Purdue University Northwest — *Feb 2020 – May 2021*
- Developed a machine learning application using DNN, lightGBM to provide steel casting temperature predictions
- Collaborated application with SQL database and GUI using Unity to display predictions and parameters
- Awarded the AIST 2021 Digitalization Applications Technology Best Paper Award
- Mentored and guided three students, and taught models for sequential predictions

TECHNICAL SKILLS

Programming: Python, Java, C/C++, SQL, C#, Objective C, MATLAB, Assembly, Bash, Mathematica, Git, Cmake
Frameworks: PyTorch, TensorFlow, Keras
Developer Tools: PyCharm, Colab, VS Code, Visual Studio, IntelliJ, Eclipse, KDevelop, Qt, Android Studio, Nsight
Libraries: OpenCV, scikit-learn, eigen3, pangolin, Sophus, ceres, g2o, PCL

PROFESSIONAL SOCIETY

IEEE Young Professionals
IEEE Signal Processing Society
Computer Vision Foundation
Material Advantage
Association for Iron & Steel Technology (AIST)

Awards

Energy Saving and Emission Reduction Competition   Beijing, China
Beijing Institute of Technology   *May 2017 – Aug 2017*
- Devised circuits to store charge generated by graphene oxide moisture, simulated charge and discharge process with Multisim, and provided theoretical analysis
- Awarded national third prize in the 10th College Students' Energy Saving and Emission Reduction Social Practice and Technology Competition

Math Modeling Contests   Beijing, China
Beijing Institute of Technology   *Mar 2016 – Jan 2017*
- Implemented algorithms including SVM, K-means, Markov chain, LDA, PCA, ARIMA, multi-variable regression
- Led a team to win the second prize in CUMCM in Sep 2016, the Honorable Mentioned prize of ICM in Jan 2017

Honors

AIST 2021 Digitalization Applications Technology Best Paper Award	*2020*
Innovative Practice Outstanding Student (5%)	*2019*
The Second Prize of the People's Scholarship	*2015 – 2017*

Publications

[1] **Zhankun Luo**. 2021. **"Structured Light Vision Systems Using a Robust Laser Stripe Segmentation Method."** Master thesis. Purdue University Graduate School, 2021. https://doi.org/10.25394/PGS.14536011.v1

[2] **Zhankun Luo**, Yaan Zhang, and Lizhe Tan. 2020. **"Multi-Level Random Sample Consensus Method for Improving Structured Light Vision Systems."** In *2020 11th IEEE Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON) (IEEE UEMCON 2020)*. New York, USA. https://doi.org/10.1109/UEMCON51285.2020.9298161

[3] Yaan Zhang, **Zhankun Luo**, Jintao Hou, Lizhe Tan, and Xinnian Guo. 2020. **"Computer Vision Techniques for Improving Structured Light Vision Systems."** In *2020 IEEE International Conference on Electro Information Technology (EIT)*, pp. 437-442. IEEE, 2020. https://doi.org/10.1109/EIT48999.2020.9208332

[4] Nicholas J. Walla, **Zhankun Luo**, Bin Chen, Yury Krotov, and Chenn Q. Zhou. 2020. **"Smart Ladle: AI-Based Tool for Optimizing Caster Temperature."** In Proceedings of *the Iron & Steel Technology Conference*. Nashville, USA. https://doi.org/10.33313/380/250