

Zhankun Luo

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EDUCATION

Purdue University Northwest <i>Master in Electrical and Computer Engineering GPA 4.0/4.0</i>	Hammond, IN Aug 2019 – May 2021
Beijing Institute of Technology <i>Bachelor in Telecommunication Engineering</i>	Beijing, China Sept 2015 – Jun 2019

RESEARCH PROJECTS

Computer Vision Techniques for Structured Light Vision Systems <i>Department of Electrical and Computer Engineering, Purdue University Northwest</i> <ul style="list-style-type: none">Conducted the experiments of 3D reconstruction with the structured light methodDeveloped the framework for structured light system with multiple cameras and multiple lasersEstablished the Multi-level RANSAC algorithm to tackle the intersection points of the multiple laser planesReconstructed the shape of object using one camera and a single projector with Gray code sequencePublished and presented papers to the IEEE eit 2020 conference and the UEMCON 2020 conferenceInstructed and mentored three student for their senior design on 3D reconstruction	2019 – Present Hammond, IN
Comparison of Capsule Networks and Other Networks for Object Segmentation <i>Department of Electrical and Computer Engineering, Purdue University Northwest</i> <ul style="list-style-type: none">Customized the neural network architecture and compared the performance of SegCap, DenseNet and U-Net on the DRIVE data set for object segmentation taskExamined the performance of VideoCapsuleNet on the action recognition UCF101 data set	2019 – 2020 Hammond, IN
Automated Fetal Brain Segmentation Using Deep Convolutional Neural Network <i>Department of Electrical and Computer Engineering, Purdue University Northwest</i> <ul style="list-style-type: none">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, respectivelyImplemented the FPN, U-Net and WGAN architectures and the focal loss for automatic fetal brain segmentationThe segmented slices of the volume will further be used in the autonomous fetus brain registration	2018 – 2019 Hammond, IN
Detection of Objects in Video Streams Using Deep Convolutional Neural Networks <i>Department of Electrical and Computer Engineering, Purdue University Northwest</i> <ul style="list-style-type: none">Developed the program using Convolutional Neural Networks for parking space classification and counting occupied parking spaces, whose accuracy reached 90%, precision was 96%Incorporated the mutual information method for image registration and the affine transformation to eliminate the impact caused by camera shake, the robustness of detection was enhanced	2018 – 2019 Hammond, IN

WORK EXPERIENCE

Research Assistant <i>Center for Innovation through Visualization and Simulation, Purdue University Northwest</i> <ul style="list-style-type: none">Developed a machine learning application using DNN, lightGBM to provide steel casting temperature predictionsCollaborated the application with SQL database and GUI using Unity to display predictions and parametersPublished the paper that was selected for the AIST 2021 Digitalization Applications Technology Best Paper AwardMentored three students and taught the models for sequential predictions	Feb 2020 – May 2021 Hammond, IN
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AWARDS

Energy Saving and Emission Reduction Competition <ul style="list-style-type: none">Devised the circuit to store the charge generated by graphene oxide moisture, simulated the charge and discharge process with Multisim, and provided the theoretical analysisAwarded the national third prize in the 10th College Students' Energy Saving and Emission Reduction Social Practice and Technology Competition	May 2017 – Aug 2017
Math Modeling Contests <ul style="list-style-type: none">Implemented algorithms including SVM, K-means, LDA, PCA, multi-variable regression, time series analysisLed the team to win the second prize in CUMCM in Sep 2016, the Honorable Mentioned prize of ICM in Jan 2017	Mar 2016 – Jan 2017

PROFESSIONAL SOCIETY

IEEE Member	2019 – Present
Material Advantage Member	2021 – Present
Association for Iron & Steel Technology (AIST) Member	2021 – Present

HONORS

The Second Prize of the People's Scholarship	2015 – 2017
Innovative Practice Outstanding Student (5%)	2019

TECHNICAL SKILLS

Languages: Python, Java, C/C++, SQL, C#, MATLAB, Mathematica, Git, Cmake
Frameworks: Pytorch, Tensorflow, Keras
Developer Tools: Pycharm, Colab, VS Code, Visual Studio, IntelliJ, Eclipse, KDevelop, Qt, Android Studio, Nsight
Libraries: eigen3, pangolin, Sophus, opencv, ceres, g2o, PCL

PUBLICATIONS

- [1] Luo, Zhankun, 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>
- [2] Zhang, Yaan, 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>
- [3] Luo, Zhankun. 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>
- [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>