

# Zhankun Luo

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## EDUCATION

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

## RESEARCH PROJECTS

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

## WORK EXPERIENCE

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

## AWARDS

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

## PROFESSIONAL SOCIETY

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IEEE Member

2019 – Present

## HONORS

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The Second Prize of the People's Scholarship

2015 – 2017

Innovative Practice Outstanding Student (5%)

2019

## TECHNICAL SKILLS

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**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, Android Studio, Nsight

**Libraries:** eigen3, pangolin, Sophus, opencv, ceres, g2o, PCL

## PUBLICATIONS

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[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] 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>