

# Zhang Handuo

Date of Birth: 28/05/1988

Nationality: Chinese

## INFORMATION

 **Web:** <https://handuo.top>

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## EDUCATION

### NANYANG TECHNOLOGICAL UNIVERSITY (NTU)

#### PH.D IN ROBOT VISION

2016-2021 | Singapore

Cum. GPA: 4.67/5.00

clear up confusion and answer questions for EEE undergraduate students in "Data structure" and "Signal Processing" as Teaching Assistant.

### NORTHEASTERN UNIVERSITY

#### M.SC IN PATTERN RECOGNITION & INTELLIGENT SYSTEM

2011 - 2013 | Shenyang, China

College of Information Science & Engineering

Major GPA: 3.94 / 4.0

#### BACHELOR'S DEGREE IN AUTOMATION

2007 - 2011 | Shenyang, China

College of Information Science & Engineering

## SKILLS

### PROGRAMMING

C & C++ • Python • SQL

### TECHNOLOGY

ROS • Pytorch • TensorFlow • FastAPI

## AWARDS

2013 National Graduate Scholarship

2012 2 times of school 1<sup>st</sup>-class scholarship.

2011 **1<sup>st</sup> Prize** for 8<sup>th</sup> National Graduate Mathematical Contest in Modeling.

2010 **Meritorious Winner** (First Prize) for 2010 American Mathematical Contest in Modeling.

## WORKING EXPERIENCES

### SHANDA GROUP PTE. LTD AI SCIENTIST

September 2023 - Present | Singapore

- Lead a team of 5 AI engineers to develop a system to orchestrate APIs from agents to complex AI workflows.
- Research on vision-language model fine-tuning for understanding diagrams and flow charts, as well as social media pictures.
- AI-Powered HR Solution (W-Hiring): Architected an AI-driven virtual HR employee system, enabling SMEs to streamline recruitment processes with minimal human intervention. Implemented advanced NLP models for resume parsing and candidate matching.
- Intelligent Marketing Platform (G-Mate): Spearheaded development of an AI-powered growth engine. Designed and implemented multi-modal AI models for user behavior analysis, content generation, and omni-channel distribution strategies.
- AI-Driven Chatbot (Watt): Developed a conversational AI system for customer service and sales, leveraging transformer-based models for natural language understanding and generation. Implemented a multi-agent framework for orchestrating complex workflows and APIs.

### MIND POINTEYE PTE. LTD AI SCIENTIST

April 2021 - August 2023 | Singapore

- Tech leader of a team of 7 AI and data engineers on the development and deployment of video algorithms and IoT analysis.
- Lead development of "Multi-embedding query for person MOT-ReID System", which uses the innovative idea of pose-guided feature alignment to improve accuracy.
- Development of human action recognition and intrusion detection, with the combination of spatio-temporal and skeleton-based models.
- Construct an object detection pipeline with quantization-aware mixed precision training on top of RT-DETR and Mask2former, integrating semi-automatic labelling and curriculum learning.
- Development of model quantization and acceleration on edge devices of all video analysis related algorithms in C++. Target edge computing chips include Rocketchip RK3588 NPU and Sophgo TPU.
- Development of long-term time-series forecasting and classification for stock return forecasting, as well as remaining useful life prediction for IoT sensors.

### NTU EEE ROBOTICS I LAB PROJECT OFFICER

Sep 2015 - Jan 2016 | Singapore

Team leader of 3 post-graduate students in the collaboration project "Using Stereo vision System on a Fast Moving Unmanned Ground Vehicle" with ST Engineering.

# PUBLICATIONS

**PhD Thesis:** Visual metric and semantic localization for UGV, 2021.

- (1) GMC: Grid Based Motion Clustering in Dynamic Environment  
**Handuo Zhang**, K Hasith, Han Wang, Intelligent System Confernece (IntelliSys), 2019.
- (2) LaCNet: Real-time End-to-End Arbitrary-shaped Lane and Curb Detection with Instance Segmentation Network  
Hui Zhou, Han Wang, **Handuo Zhang** and K Hasith, ICARCV 2020.
- (3) Multiple Object Tracking With Attention to Appearance, Structure, Motion and Size  
K Hasith, Han Wang, **Handuo Zhang**, IEEE Access, 2019.
- (4) Real Time Multiple Object Tracking using Deep Features and Localization Information  
K Hasith, **Handuo Zhang**, Han Wang, ICCA, 2019.
- (5) A consistent and long-term mapping approach for navigation  
**Handuo Zhang**, K Hasith, Han Wang, International Journal of Research in Advent Technology (IJRAT), 2019.
- (6) Heading Reference-Assisted Pose Estimation for Ground Vehicles  
Han Wang, Rui Jiang, **Handuo Zhang**, SS Ge. IEEE Transactions on Automation Science and Engineering (T-ASE), 2018.
- (7) A hybrid feature parametrization for improving stereo-SLAM consistency  
**Handuo Zhang**, K Hasith, Han Wang, International Conference on Control and Automation (ICCA), 2017.
- (8) Ultra-wideband aided fast localization and mapping system  
Chen Wang, **Handuo Zhang**, TM Nguyen, L Xie, International Conference on Intelligent Robots and Systems (IROS), 2017.
- (9) Stereo vision based negative obstacle detection  
K Hasith, **Handuo Zhang**, Han Wang, ICCA, 2017.
- (10) Object co-segmentation via weakly supervised data fusion  
Shiping Wang, **Handuo Zhang**, Han Wang. Computer Vision and Image Understanding (CVIU), 2017.

# PROJECTS

For recent projects, please refer to <https://handuo.top/projects/>.

## STEREO VISION SYSTEM ON UGV

COOPERATION WITH ST ENGINEERING

2016 –2018 | Singapore

See project page: [ugv\\_stereo.gitlab.io](https://handuo.top/projects/ugv_stereo) for more details.

The project aims to develop and implement a high speed stereo vision system and apply it onto unmanned ground vehicles (UGV) with multi-sensor fusion with deep neural network. The method uses bird's-eye view representation space to preserve both geometric and semantic information.

We deploy obstacle detection & tracking system (for objects 50 meters away), road feature detection (including lanes and curbs), and visual SLAM into a unified system to make UGV run at 60 km/h speed.

- SLAM under heavy traffic has translation RMSE 0.043% and rotation 0.41°.
- Object tracking method (MASS): TPR is 0.947, MOTA 0.915, ranking 4<sup>th</sup> in KITTI tracking benchmark in 2019. (Right now ranked in 68<sup>th</sup> position due to the boom of deep learning based MOT methods).
- Object distance, bearing and size estimation mean error 1.58m, 1.25° and 0.45m in about 30 meters.
- Lane & Curb detection TPR 98%.