

# Zhang Handuo 张瀚铎

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## EDUCATION

### NANYANG TECHNOLOGICAL UNIV.

PH.D IN ELECTRICAL &  
ELECTRONIC ENGINEERING  
Expected Jun. 2020 | Singapore  
Cum. GPA: 4.67/5.00

### NORTHEASTERN UNIV.

M.Sc IN CONTROL THEORY & CONTROL  
ENGINEERING  
Expected Jun. 2013 | Shenyang, China  
Conc. in Pattern Recognition & Intelligent System  
College of Information Science & Engineering

### BS IN AUTOMATION

Expected May 2011 | Shenyang, China  
Conc. in Automation  
College of Information Science & Engineering  
Cum. GPA: 3.92 / 4.0  
Major GPA: 3.94 / 4.0

## PROJECTS

### STEREO VISION SYSTEM ON UGV

2016 ~ 2019

A high speed obstacle detection & tracking system, road feature detection, and SLAM for all terrain unmanned autonomous.

- Object tracking TPR is 0.947, MOTA 0.915, ranking 4<sup>th</sup> in KITTI tracking benchmark.
- Object distance, size and bearing estimation mean error 1.58m, 1.25° and 0.45m.
- SLAM under heavy traffic has translation RMSE 0.043% and rotation 0.41°.
- Lane & Curb detection TPR 98%.

### MULTI-CAM PANORAMIC STITCHING

2012 ~ 2013    Work during Master days

- Panoramic image of vehicle surroundings in bird-eye view with 4 fisheye cameras.
- In charge of Mei camera calibration, un-distortion, and scene warping based on homogeneous matrix.

## SKILLS

### PROGRAMMING

C & C++ • Python • MATLAB  
ROS • Pytorch • Tensorflow •  $\LaTeX$

## EXPERIENCE

### SHENYANG INSTITUTE OF AUTOMATION CHINESE ACADEMY OF SCIENCES | ASSISTANT RESEARCHER

Aug 2013 - Sep 2015 | Shenyang, China

- I was in charge of robot communication and console system development.
- During the two years, I took part in five projects and two of them are supported by nation-level programs.

### NTU EEE ROBOTICS I LAB | PROJECT OFFICER

Sep 2015 - Jan 2016 | Singapore

- Worked for the stereo vision based unmanned vehicle team to design and construct the hardware and software platform.
- Lead the project "Using Stereo vision System on a Fast Moving Unmanned Ground Vehicle" and mainly in charge of self localization and map fusion based on multiple cameras. For more details on research paper, please refer to Handuo's Page.

## RESEARCH

- GMC: Grid Based Motion Clustering in Dynamic Environment  
**Handuo Zhang**, K Hasith, H Wang, IntelliSys, 2019.
- a consistent and long-term mapping approach for navigation  
**Handuo Zhang**, K Hasith, H Wang, IJRAT, 2019 (Accepted).
- A hybrid feature parametrization for improving stereo-SLAM consistency  
**Handuo Zhang**, K Hasith, H Wang, ICCA, 2017.
- Ultra-wideband aided fast localization and mapping system  
Chen Wang, **Handuo Zhang**, TM Nguyen, L Xie, IROS, 2017.
- Stereo vision based negative obstacle detection  
K Hasith, **Handuo Zhang**, H Wang, ICCA, 2017.
- Multiple Object Tracking With Attention to Appearance, Structure, Motion and Size  
K Hasith, H Wang, **Handuo Zhang**, IEEE Access, 2019.
- Heading Reference-Assisted Pose Estimation for Ground Vehicles  
Han Wang, R Jiang, **Handuo Zhang**, SS Ge. IEEE Transactions on Automation Science and Engineering, 2018.
- Object co-segmentation via weakly supervised data fusion  
Shiping Wang, **Handuo Zhang**, H Wang. Computer Vision and Image Understanding, 2017.

## AWARDS

- 2013    National Graduate Scholarship
- 2012    2 times of school first-class scholarship
- 2011    1<sup>st</sup> for 8<sup>th</sup> National Graduate Mathematical Contest in Modeling
- 2010    **Meritorious Winner** (First Prize) for 2010 American Mathematical Contest in Modeling