

# NING-HSU WANG

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## SUMMARY OF QUALIFICATIONS

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- Research abilities developed by designing novel deep neural networks and submitting/presenting in top conferences/workshops.
- Robotics and Mechanical Engineering skills enhanced by designing mechanism and control system in multiple undergraduate projects.
- Project lead of a 14-month and ongoing stereo depth estimation project.
- Demonstrated teamwork skills as a collaborator of multiple projects (360° Stereo, Planar Reconstruction, 3D Horror Scene, etc.) and nationwide startup competition.
- Self-motivated fast learner who explores various fields of expertise from Computer Vision, Robotics to Business.

## EDUCATION

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### National Tsing Hua University

*January 2018 - Present*

Master in Electrical Engineering

Advised by Prof. Min Sun.

**GPA: 4.3/4.3**

### National Chiao Tung University

*Sep 2013 - June 2017*

Bachelor in Mechanical Engineering

**GPA: 3.41/4.0, Last 60: 3.67/4.0, Ranking: 13/49, 25/99**

## PUBLICATIONS

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### **360SD-Net: 360° Stereo Depth Estimation with Learnable Cost Volume**

- **Ning-Hsu Wang**, Bolivar Solarte, Yi-Hsuan Tsai, Wei-Chen Chiu, Min Sun
- *International Conference on Robotics and Automation 2020 (ICRA 2020)*, **Accepted**
- *Short Version in ICCV 2019 360PI Workshop*, **Spotlight**

## EXPERIENCE

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### Mediatek

*February 2020 - Present*

- *Computer Vision Research Intern*

### Vision Science Lab, National Tsing Hua University

*January 2018 - Present*

- *Research Student, advised by Prof. Min Sun.*

**Project lead of 360° Stereo Depth Estimation**, co-advised by Prof. Wei-Chen Chiu and Dr. Yi-Hsuan Tsai. We proposed the Learnable Cost Volume to improve stereo matching on 360° images, and was accepted in **ICRA 2020** (short version accepted as **Spotlight Paper in ICCV-W 2019**).

**Planar Reconstruction**, co-advised by Prof. Hwann-Tzong Chen, is currently in submission.

### Young Entrepreneurs of the Future, Epoch Foundation

*January 2018 - July 2018*

- *Contestant, Team Technical Lead*

A nationwide startup competition including the following progress: Garage Party, Elevator Pitch, Workshop, with a **Second Place Award** in Garage Party.

<b>Atos</b>	<i>August 2017</i>
- <i>On-site Engineer</i>	
- <i>29th Summer Universiade internet system maintenance.</i>	
<b>Tokyo Electron Limited Robot Combat</b>	<i>2017</i>
- <i>Contestant</i>	
<b>Programming Education Product Sales</b>	<i>2014 - 2016</i>
- <i>Part-time Sales</i>	
<b>Hsinchu District Badminton Competition</b>	<i>2015</i>
- <i>Umpire and Service Judge</i>	
<b>University System of Taiwan, Badminton Invitation Competition</b>	<i>2014</i>
- <i>Website Management and Promotion</i>	

## PROJECT HIGHLIGHTS

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### 360° Stereo Depth Estimation and 3D Reconstruction

- Presented a new 360° stereo dataset.
- Implementation of deep neural network baselines as well as conventional methods.
- Presented a deep neural network with several novel modules for 360° stereo depth estimation.

### Planar Reconstruction

- Presented a new 360° planar dataset as well as a new benchmark.
- Implementation of deep neural network baselines with adaption to 360° images.
- Presented a new planar representation to solve the 360° ground truth surface inconsistency.
- Proposed several modifications for the adaptation of perspective methods in 360° data.

### 3D Horror Scene: Horror Style Transfer Using 360° Views and 3D Reconstruction

- Collection of horror scene data.
- Implementation of **CycleGAN** for style transfer.
- Implementation of **LayoutNet** for 360° layout reconstruction.

### Design and implementation of Logistic UAV (Unmanned Aerial Vehicle)

- Design and implementation of UAV mechanism.
- Design and implementation of unloading mechanism and motor control system.
- Design of UAV surveillance system.
- Demonstration of UAV control for unseen location object unloading.

### Object Searching Robot Design

- Design and implementation of KNR mechanism and ultrasonic avoidance system.
- LabVIEW programming of motor control, sensor feedback and image processing.

### Validation of *The Lambda Method for Integer Ambiguity Estimation*

- Implementation of *The Lambda Method for Integer Ambiguity Estimation* with Matlab simulation.

## ABILITIES AND CERTIFICATIONS

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<b>Programming</b>	<b>Python, C/C++, Assembly, HTML, CSS</b>
<b>DL Framework</b>	<b>Pytorch, TensorFlow</b>
<b>Software &amp; Tools</b>	<b>LabVIEW: Industrial Control &amp; Simulation</b>
	<b>Matlab: Mathematics Simulation</b>
	<b>LTSpice: Electrical Circuit Simulation</b>
	<b>ANSYS-Fluent: Computational Fluid Dynamics Simulation</b>
	<b>AutoCAD, Solidworks: Computer-aided Design Drafting Software</b>
<b>Hardware</b>	<b>Arduino, 8051</b>
<b>Misc.</b>	<b>OpenCV, Github, Vim, Linux, L<sup>A</sup>T<sub>E</sub>X</b>
<b>Language</b>	<b>Fluent in Mandarin (Native)</b>
	<b>Proficient in English, TOEIC Golden Certification (Score: 900)</b>
	<b>Elementary Proficiency in Japanese (4 semesters)</b>