

# 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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### 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 (**ICCV 2019 Workshop Spotlight Paper**), with an extended work in submission.

**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.

### Atos

*August 2017*

- *On-site Engineer*
- *29th Summer Universiade internet system maintenance.*

### Tokyo Electron Limited Robot Combat

*2017*

- *Contestant*

**Programming Education Product Sales**

2014 - 2016

- *Part-time Sales***Hsinchu District Badminton Competition**

2015

- *Umpire and Service Judge***University System of Taiwan, Badminton Invitation Competition**

2014

- *Website Management and Promotion***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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**Programming**

Python, C/C++, Assembly, HTML, CSS

**DL Framework**

Pytorch, TensorFlow

**Software & Tools**

LabVIEW: Industrial Control &amp; Simulation

Matlab: Mathematics Simulation

LTSpice: Electrical Circuit Simulation

ANSYS-Fluent: Computational Fluid Dynamics Simulation

AutoCAD, Solidworks: Computer-aided Design Drafting Software

**Hardware**

Arduino, 8051

**Misc.**OpenCV, Github, Vim, Linux,  $\text{\LaTeX}$ **Language**

Fluent in Mandarin (Native)

Proficient in English, TOEIC Golden Certification (Score: 900)

Elementary Proficiency in Japanese (4 semesters)

**AWARDS**

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International Conf. on Computer Vision 2019 (ICCV 2019) 360 PI Workshop

2019

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

Young Entrepreneurs of the Future Garage Party, Epoch Foundation

2018

- *Second Place*