NING-HSU WANG

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RESEARCH INTERESTS

Topics: 3D Geometry, Robotics Perception, Computer Vision, Deep Learning
My current research focuses on 3D Geometry and Depth Estimation on 360°, Light-Field and shallow Depth of Field images with applications such as 3D Reconstruction and Robotic Perception.

EDUCATION

National Tsing Hua University *January 2018 - July 2020*
- Master in Electrical Engineering
- Advised by Prof. Min Sun.
- **GPA: 4.3/4.3**

National Chiao Tung University *September 2013 - June 2017*
- Bachelor in Mechanical Engineering
- **GPA: 3.41/4.0, Ranking: 13/49, 25/99**

PUBLICATIONS

360SD-Net: 360° Stereo Depth Estimation with Learnable Cost Volume, (ICRA 2020)
- ***Ning-Hsu Wang****, Bolivar Solarte, Yi-Hsuan Tsai, Wei-Chen Chiu, Min Sun*
- *Short Version in ICCV 2019 360PI Workshop,* ***Spotlight***

We proposed a novel DNN targeting 360° stereo images. With this new task in Computer Vision, we presented two datasets for this task and achieved state-of-the-art among many representative baselines.

Indoor Panorama Planar 3D Reconstruction via Divide and Conquer, (CVPR 2021 Oral)
- *Cheng Sun, Chi-Wei Hsiao,* ***Ning-Hsu Wang****, Min Sun*, Hwann-Tzong Chen

We proposed a new benchmark for indoor panorama planar reconstruction by extending existing 360° datasets and and adopting state-of-the-art methods to the 360° datasets. We presented a new method which leverages the phenomenon of indoor human structures and 360° images and achieved state-of-the-art on the proposed benchmark.

Bridging Unsupervised and Supervised Depth from Focus via All-in-Focus Supervision
- *In submission*

AWARDS AND HONOR SOCIETY

The Phi Tau Phi Scholastic Honor Society of the Republic of China. *2020*
- *Honorary Member of the Society*

Appier Conference Scholarship for Top Researches on Artificial Intelligence. *2020*

EXPERIENCE

MediaTek *February 2020 - March 2021*
- *Computer Vision Research Intern*

I worked as a research oriented internship with topics related to Stereo Matching, Disparity Estimation, Light-Field Camera, DoF (Depth of Field) Images and Blur/Bokeh Effects.

Vision Science Lab, National Tsing Hua University *January 2018 - July 2020*
- *Research Student, advised by Prof. Min Sun.*

I mainly worked as the **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 depth estimation on 360° images (**ICRA 2020**). I also worked on **Planar Reconstruction**, co-advised by Prof. Hwann-Tzong Chen. We proposed a new method as well as a new benchmark on indoor panorama planar reconstruction (**CVPR 2021 oral**).

Young Entrepreneurs of the Future, Epoch Foundation *January 2018 - July 2018*

- *Contestant*

I worked as the technical lead in this nationwide startup competition, which includes the following stages: Garage Party, Elevator Pitch, Workshop. We won the **Second Place Award** in the Garage Party stage.

Atos *August 2017*

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

PROJECT HIGHLIGHTS

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.
- Demostration 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

Programming	**Python, C/C++, HTML, CSS**
DL Framework	**Pytorch, TensorFlow**
Software & Tools	**LabVIEW**: Industrial Control & 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, LaTeX**
Language	**Fluent in Mandarin (Native)**
	Proficient in English, TOEIC Golden Certification (Score: 900)
	Elementary Proficiency in Japanese (4 semesters)