

# Chia-Kai (Kai) Yeh

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## Education

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### Northwestern University, Evanston, IL

*Ph.D. Computer Science*

*June 2020 (Anticipated)*

- Related courses: Machine learning, Deep learning, Introduction to computational photography, Introduction to computer vision, Advance computer graphics, Advance computer vision
  - Research interests: 3D reconstruction, Appearance acquisition, Multi-view stereo and Photogrammetry
- Advisor: Prof. Oliver Cossairt

### Northwestern University Kellogg School of Management, Evanston, IL

*Certificate in Management for Scientists and Engineers*

*Aug. 2019*

- Received certificate from program aimed at developing business and management skills in STEM PhD students.
- Topics included marketing, economic strategy, accounting, risk/uncertainty management, IP management, entrepreneurship, crisis management, finance, and operations management.

### Chang Gung University, Taoyuan, Taiwan

*Bachelor of Science Electronic Engineering*

*June 2013*

- Related courses: Digital signal processing, Microprocessor, Embedded system, Digital logic circuit design, Data structures, Numerical methods, Geometrical optics and Algorithm

### National Taiwan University — Yen Tjing Ling Industrial Research Institute, Taipei, Taiwan

*Certificate in Optical designed of mobile camera*

*May 2012 — June 2012*

- Learned optics theory, aberration theory, how to conduct the optical design for camera module product, and performing the stray light analysis of the design by using Code V and Light Tools

## Publications

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### A Streamlined Photometric Stereo Framework for Cultural Heritage.

Chia-Kai Yeh, Nathan Matsuda, Xiang Huang, Fengqiang Li, Marc Walton, Oliver Cossairt. ECCV Workshops on Computer Vision for Art Analysis 2016.

### Shape-from-Shifting: Uncalibrated Photometric Stereo with a Mobile Device.

Chia-Kai Yeh, Fengqiang Li, Gianluca Pastorelli, Marc Walton, Aggelos K. Katsaggelos and Oliver Cossairt. IEEE International Conference on eScience Workshop on High Throughput Digitization for Natural History Collections (BigDig) 2017

### Photometric Stereo by UV-Induced Fluorescence to Detect Protrusions on Georgia O'Keeffe's Paintings.

Johanna Salvant, Marc Walton, Dale Kronkright, Chia-Kai Yeh, Fengqiang Li, Oliver Cossairt, Aggelos Katsaggelos. Accepted for publication in the Springer Nature book: Metal Soaps in Art-Conservation & Research

### CS-ToF: High-resolution compressive time-of-flight imaging

Fengqiang Li, Huaijin Chen, Adithya Pediredla, Chia-Kai Yeh, Kuan He, Ashok Veeraraghavan, and Oliver Cossairt. Optics Express, 25(25) 31096-31110, 2017

### High spatial resolution time-of-flight imaging

Fengqiang Li, Huaijin Chen, Chia-Kai Yeh, Kuan He, Ashok Veeraraghavan, and Oliver Cossairt. Proc. SPIE 10669, Computational Imaging III, 1066908 2018

## Work Experience

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### Adobe Inc, San Jose, CA

*Research Intern*

*June, 2018 — Feb. 2019*

- Research in photorealistic human facial geometry and reflectance modeling
- Participated in the project of Light Dome setup for human facial geometry and reflectance modeling
- <https://research.adobe.com/news/photogeode-3d-faces-from-2d-imagery/>

Advisor: Dr. Sunil Hadap, Dr. Duygu Ceylan

## **Institution of Creative Technologies, University of Southern California, Los Angeles, CA**

*Visiting Researcher of Graphics Lab*

June, 2016 — Sept. 2016

- Research in markerless human body and facial 3D reflectance motion capturing under multi-view stereo videos from Light Stage
- Participated in the project of miniature dome setup for bidirectional texture function acquisition
- Advisor: Dr. Andrew Jones

## **3D Aperture Technologies Co., Ltd, Taipei, Taiwan**

*Camera Module Design Engineer*

Oct. 2014 — Aug. 2015

- Evaluated and designed the optical mechanical system and optical designed in array camera module
- Developed array camera module firmware, calibration process, image quality evaluation, demo software and UI designed
- Worked on camera sensor porting and image pipeline on embedded and Android platform
- Worked with clients such as Google (ATAP Project Ara) and Amazon Lab126 on advance mobile camera module development
- Led the team, built the 3D capture environment for multi-view stereo 3D reconstruction
- Researched in camera calibration, image pipeline, image fusion algorithm and multi-view 3D reconstruction

## **AAC CAMOS Technologies Co., Ltd, Taipei, Taiwan**

*Internship*

July 2013 — Oct. 2013

- Participated the mobile-based compact array camera module development; joined the development of 1x2, 2x2 array with 2Mp per channel with 4mm baseline project and performing the image performance evaluation and benchmarking
- Led the hardware and software development of the automated connectivity tester for array camera product in the production line by designed the digital logic circuit in CPLD and programed the software to control the hardware through I2C protocol

## **Media Coverage**

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### **New app reveals the hidden landscapes within Georgia O’Keeffe’s paintings.**

Sid Perkins, Science, February 16, 2019

<https://www.sciencemag.org/news/2019/02/new-app-reveals-hidden-landscapes-within-georgia-o-keeffe-s-paintings>

### **Why Are Georgia O’Keeffe’s Paintings Breaking Out in Pimples? A new handheld tool lets scientists diagnose the chemical reaction behind “art acne”-and learn how it can be prevented.**

Lily Strellich, Smithsonian.com, February 22, 2019

<https://www.smithsonianmag.com/arts-culture/why-are-georgia-okeeffes-paintings-breaking-out-pimples-180971518/>

## **Skills**

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- Coding skills: C/C++, Matlab, OpenCV, Python, Java, Javascript, Verilog, CUDA, WebGL, TensorFlow, Pytorch
- Professional skills: AutoCAD, LabView, CodeV, Protel (Circuit design, PCB layout), Soldering

## **Professional Experience**

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### **Professional Service**

2016 Student Volunteer-ICCP

2017 Reviewer-UIST

2019 Speaker-Adventures in Seeing Works of Art: A COSI Workshop in Deflectometry, Smart Museum of Art, The University of Chicago

### **Teaching Experience**

2016 Teaching Assitant-EECS101: An intro to computer science for everyone, Northwestern University

2017 Teaching Assitant-EECS110: Intro to Computer Programing (Python), Northwestern University

2019 Teaching Assitant-EECS395/495: Machine Learning: Foundations, Applications, and Algorithms, Northwestern University

## **Languages**

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Mandarin Chinese (Native); Taiwanese (Native); English (Professional proficiency)