Chih-Hui (John) Ho

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Education

Sep. 2019 - Now **University of California San Diego, La Jolla, CA**.
PhD candidate in Electrical Computer Engineering
Advisor: Prof. Nuno Vasconcelos

Sep. 2017 - Jun. 2019 **University of California San Diego, La Jolla, CA**.
M.S. in Computer Science, GPA: 3.87/4.0

Jan. 2016 - May 2016 **University of Illinois at Urbana-Champaign, Champaign, IL**.
Exchange student in Computer Science, GPA: 3.71/4.0

Sep. 2012 - Jun. 2016 **National Chiao Tung University, Hsinchu, Taiwan**.
B.S. in EECS Honor Program, GPA: 4.15/4.3

Research Interest

Computer Vision: Recognition, Multiview object classification, 3D understanding

Deep Learning: Metric learning, Adversarial attack, Self-supervised learning, Continuous learning

Publication

2022 **Chih-Hui Ho**, Nuno Vasconcelos, "DISCO: Adversarial Defense with Local Implicit Functions", In *Neural Information Processing Systems (NeurIPS)*, 2022 *[Paper]*

2022 **Chih-Hui Ho**, Srikar Appalaraju, Bhavan Jasani, R. Manmatha, Nuno Vasconcelos, "YORO - Lightweight End to End Visual Grounding", In *European Conference On Computer Vision Workshop (ECCVW)*, 2022 *[Paper] [Blog]*

2022 Brandon Leung, **Chih-Hui Ho**, Nuno Vasconcelos, "Black-Box Test-Time Shape REFINEment for Single View 3D Reconstruction", In *IEEE Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, 2022 *[ArXiv]*

2020 **Chih-Hui Ho**, Nuno Vasconcelos, "Contrastive Learning with Adversarial Examples", In *Neural Information Processing Systems (NeurIPS)*, 2020

2020 Tz-Ying Wu, Pedro Morgado, Pei Wang, **Chih-Hui Ho**, Nuno Vasconcelos, "Solving Long-tailed Recognition with Deep Realistic Taxonomic Classifier", In *European Conference on Computer Vision (ECCV)*, 2020

2020 **Chih-Hui Ho**, Bo Liu, Tz-Ying Wu, Nuno Vasconcelos, "Exploit Clues from Views: Self-Supervised and Regularized Learning for Multiview Object Recognition", In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020

2020 Jen-Hui Chuang, **Chih-Hui Ho**, Ardian Umam, HsinYi Chen, Mu-Tien Lu, Jenq-Neng Hwang, Tai-An Chen, "Geometry-Based Camera Calibration Using Closed-Form Solution of Principal Line" , IEEE Transaction on Image Processing (TIP) 2020. *[Paper] [ArXiv]*

2019 **Chih-Hui Ho**, Pedro Morgado, Amir Persekian, Nuno Vasconcelos, "PIEs: Pose Invariant Embeddings", In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019

2019 **Chih-Hui Ho**[*], Brandon Leung[*], Erik Sandstrom, Yen Chang, Nuno Vasconcelos, "Catastrophic Child's Play: Easy to Perform, Hard to Defend Adversarial Attacks", In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019

2019 Brandon Leung, **Chih-Hui Ho**, Amir Persekian, David Orozco, Yen Chang, Erik Sandstrom, Bo Liu, Nuno Vasconcelos, "OOWL500: Overcoming Dataset Collection Bias in the Wild", *[ArXiv]*

2018 Yu-Shiuan Tsai, Yi-Yu Hsieh, **Chih-Hui Ho**, Ya-Ching Chang, Yao-Yuan Chang, Heng-Jyun Lin, Han-Yang, Wang; Yu-Chen Chou, Jen-Hui Chuang, "Rule-Based Optical Character Recognition for Serial Number on Renminbi Banknote", In *IS&T Electronic Imaging 2018 (EI)* (oral presentation)

Preprint

2022 Simeng Zheng, **Chih-Hui Ho**, Paul H Siegel, "Modeling Flash Memory Channels Using Conditional Generative Nets", 2022, *[ArXiv]*

Professional Experience

Jan. 2018 - Now **Graduate Student Researcher, Statistical Visual Computing Lab, UCSD**.
Working on multiview recognition, 3D vision, self-supervised learning, structured embedding

Jun. 2021 - Sept. 2021 **Amazon AWS Applied Scientist Intern**.
Developed a visual grounding transformer model with 1.3x smaller size and 3x faster speed

Sep. 2017 - Dec. 2017 **Research Volunteer, San Diego Supercomputer Center**.
Reduced error of large scale operational facility data (200 GB) in scientific workflow by 23%

Nov. 2016 - Jun. 2017 **Research Assistant, NCTU Computer Vision Research Center**.
- Developed deep learning model for human activity analysis in aerial images
- Designed bill serial number recognition system with more than 99 % accuracy
- Developed camera calibration algorithm and implemented the algorithm into prototype
- Developed algorithm for automated optical inspection (AOI) for bobbin defects

Jan. - Dec. 2015 **Software Engineer Internship, Industrial Technology Research Institute**.
- Developed a prototype to calibrate robotic arm with an industrial camera
- Represented ITRI to attend 2015 Taiwan Automation Intelligence and Robot Show
- Received Mechanical and Systems Research Lab Prospective Project Excellence Award

Jul. - Aug. 2014 **Research Internship, Cornell University Advanced Multimedia Lab**.
Design algorithm to generate image collage based on emotional ROIs

Academic Services

Reviewer NeurIPS (2022, 2021, 2020), CVPR (2022, 2021 (**Outstanding Reviewer**), 2020), ECCV (2022, 2020), ICCV (2021), TPAMI (2021), ICML (2022 (**Outstanding Reviewer**), 2021), ICLR (2022), ACCV (2020), WACV (2022, 2021), CVPR Learning with Limited Labelled Data for Image and Video Understanding Workshop (2022), ECCV Imbalance Problems in Computer Vision Workshop (2020), ICIP (2022, 2020, 2019)

Volunteer CVPR 2020 Area Chair Meeting, San Diego

Teaching Experience

UCSD ECE 271A Statistical Learning I, ECE 271B Statistical Learning II, ECE 271C Deep Learning and Applications

Selected Projects

Jan. - Mar. 2018 **2018 Kaggle data science bowl**, *Keras*.
- Implemented image segmentation deep learning models for medical images
- Ranked top 18% in the competition

Nov. 2016 - Jun. 2017 **Deep learning based human activity analysis for aerial images**, *C*.
- Trained convolutional neural network to detect human with more than 91%
- Analyzed human behavior with principle component analysis and vanishing point

Nov. 2016 - Jun. 2017 **Assignment design for UIUC CS543 computer vision course**, *Matlab*.
- Implemented example code and designed example architecture to train Cifar 100
- Wrote deep learning tutorials and assignment walkthrough instructions on Kaggle

Jul. - Dec. 2013 **Human tracking mobile robots with Kinect**, *C++*.
- Identified user patterns with SIFT and GMM background subtraction algorithms
- Integrated depth sensor information, target user features and mobile robot control

Skills

Languages Python, C/C++ , MATLAB, C#

Library Pytorch, Tensorflow, Numpy, Pandas, Matplotlib, MatConvNet, OpenCV, Keras, Kubernetes, LaTeX

Leadership

2018-2022 **Summer Research Internship Program, UCSD**.

- Mentored students in the Spring/Summer Research Intern Program (SRIP) in computer vision research.
- **2018-2020** Collected a large scale dataset, Objects Obtained With fLight (OOWL), with drone. Published 3 paper using the collected dataset. *[Webpage]*
- **2021** Collected a large scale self-driving dataset with explanation on the driving action. *[Webpage]*
- **2022** Collected a large scale visual language dataset that contains unanswerable questions. One paper under submission.

2019-2020 **GEAR Research Mentor, UCSD**.

- Mentored students in Guided Engineering Apprenticeship in Research (GEAR) program in computer vision research.

2018-2019 **ENLACE bi-national summer research program, UCSD**.

- Mentored students in ENLACE, a high school outreach program promoting diversity in research, especially in Hispanic communities.

2013-2014 **President of Student Association of EECS Department, NCTU**.

- Organize student events and invite speakers from industry for tech talk

Award

Nov 2022 NeurIPS 2022 Scholar Award

June 2022 Amazon Post-Internship Fellowship

May 2021 2021 Qualcomm Innovation Fellowship Finalist [link]

Spring 2019 UCSD graduate student association travel grant award

Jan. 2016 - May 2016 Full Scholarship as exchange student at UIUC

Jul. - Aug. 2014 Full Scholarship for an internship in Cornell University

Sep. 2012 - Jun. 2016 National Chiao Tung University scholarship

Exchange Experience

Jan. - Jun. 2016 Exchange student at University of Illinois at Urbana-Champaign

Jul. - Aug. 2014 Short term internship in Advanced Multimedia Lab in Cornell University

Language

Mandarin, English