

# Chih-Hui (John) Ho

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## Education

- Sep. 2019 - **University of California San Diego, La Jolla, CA.**  
Now PhD candidate in Electrical Computer Engineering  
Advisor: Prof. Nuno Vasconcelos
- Sep. 2017 - **University of California San Diego, La Jolla, CA.**  
Jun. 2019 M.S. in Computer Science, GPA: 3.87/4.0
- Jan. 2016 - **University of Illinois at Urbana-Champaign, Champaign, IL.**  
May 2016 Exchange student in Computer Science, GPA: 3.71/4.0
- Sep. 2012 - **National Chiao Tung University, Hsinchu, Taiwan.**  
Jun. 2016 B.S. in EECS Honor Program, GPA: 4.15/4.3

## Research Interest

Computer Vision: Multiview object recognition, Visual language, 3D understanding  
Deep Learning: Large language/foundational model (LLM), Self-supervised learning, Metric learning, Adversarial robustness

## Publication

- 2023 **Chih-Hui Ho\***, Tz-Ying Wu\*, Nuno Vasconcelos, "ProTeCt: Prompt Tuning for Hierarchical Consistency", Under Review, 2023, *[Preprint]*
- 2023 **Chih-Hui Ho\***, Yuwei Zhang\*, Nuno Vasconcelos, "Toward Unsupervised Realistic Visual Question Answering", Under Review, 2023, *[Preprint]*
- 2023 Simeng Zheng, **Chih-Hui Ho**, Paul H Siegel, "Modeling Flash Memory Channels Using Conditional Generative Nets", Design Automation and Test in Europe, 2023, *[ArXiv]*
- 2023 **Chih-Hui Ho**, Ziheng Huang, NaYeon Kim, YouSuk Bae, Nuno Vasconcelos, "Tire Defect Detection with Limited Annotation", Electronic Imaging (EI), Intelligent Robotics and Industrial Applications using Computer Vision, **Oral**, 2023.
- 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**)

## Professional Experience

- Jan. 2018 - **Graduate Student Researcher, Statistical Visual Computing Lab, UCSD.**  
Now Working on multiview recognition, 3D vision, self-supervised learning, structured embedding
- Jun. 2021 - **Amazon AWS Applied Scientist Intern.**
- Sept. 2021 Developed a visual grounding transformer model with 1.3x smaller size and 3x faster speed
- Sep. 2017 - **Research Volunteer, San Diego Supercomputer Center.**
- Dec. 2017 Reduced error of large scale operational facility data (200 GB) in scientific workflow by 23%
- Nov. 2016 - **Research Assistant, NCTU Computer Vision Research Center.**
- Jun. 2017
- o Developed deep learning model for human activity analysis in aerial images
  - o Designed bill serial number recognition system with more than 99 % accuracy
  - o Developed camera calibration algorithm and implemented the algorithm into prototype
  - o Developed algorithm for automated optical inspection (AOI) for bobbin defects
- Jan. - Dec. 2015 **Software Engineer Internship, Industrial Technology Research Institute.**
- o Developed a prototype to calibrate robotic arm with an industrial camera
  - o Represented ITRI to attend 2015 Taiwan Automation Intelligence and Robot Show
  - o Received Mechanical and Systems Research Lab Prospective Project Excellence Award
- Jul. - Aug. 2014 **Research Internship, Cornell University Advanced Multimedia Lab.**
- 2014 Design algorithm to generate image collage based on emotional ROIs

## Academic Services

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

## Teaching Experience

- UCSD ECE 175A Elements of Machine Intelligence [Discussion Lead](Recording), ECE 271A Statistical Learning I, ECE 271B Statistical Learning II, ECE 271C Deep Learning and Applications

## Selected Projects

- Jan. 2021 - **Defect Detection, Pytorch.**  
Now
- o Collaborating with Korea Polytechnic University to detect tire and pcb defects
  - o 1 paper published in EI conference about defect detection with self-supervised learning techniques
- Jan. - Mar. 2018 **2018 Kaggle data science bowl, Keras.**
- 2018
- o Implemented image segmentation deep learning models for medical images
  - o Ranked top 18% in the competition
- Nov. 2016 - **Deep learning based human activity analysis for aerial images, C.**
- Jun. 2017
- o Trained convolutional neural network to detect human with more than 91%
  - o Analyzed human behavior with principle component analysis and vanishing point

- Nov. 2016 - **Assignment design for UIUC CS543 computer vision course, Matlab.**  
Jun. 2017
  - o Implemented example code and designed example architecture to train Cifar 100
  - o Wrote deep learning tutorials and assignment walkthrough instructions on Kaggle
- Jul. - Dec. 2013 **Human tracking mobile robots with Kinect, C++.**
  - o Identified user patterns with SIFT and GMM background subtraction algorithms
  - o Integrated depth sensor information, target user features and mobile robot control

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## Skills

- Languages Python, C/C++ , MATLAB, C#  
Library Pytorch, Tensorflow, Numpy, Pandas, Matplotlib, MatConvNet, OpenCV, Docker, Keras, Kubernetes,  $\text{\LaTeX}$

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## Leadership

- 2018-Now **Summer Research Internship Program, UCSD.**
  - o Mentored students in the Spring/Summer Research Intern Program (SRIP) in computer vision research.
  - o **2018-2020** Collected a large-scale dataset, Objects Obtained With fLight (OOWL), with a drone. Published 3 papers using the collected dataset. [\[Webpage\]](#)
  - o **2021** Collected a large-scale self-driving dataset with the explanation of the driving action. [\[Webpage\]](#)
  - o **2022** Collected a large-scale visual language dataset that contains unanswerable questions. One paper is under submission.
- 2019-2020 **GEAR Research Mentor, UCSD.**
  - o Mentored students in Guided Engineering Apprenticeship in Research (GEAR) program in computer vision research.
- 2018-2019 **ENLACE bi-national summer research program, UCSD.**
  - o 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.**
  - o Organize student events and invite speakers from the industry for tech talk

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## 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 - Full Scholarship as exchange student at UIUC  
May 2016  
Jul. - Aug. 2014 Full Scholarship for an internship in Cornell University  
Sep. 2012 - National Chiao Tung University scholarship  
Jun. 2016

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## 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

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## Language

Mandarin, English