

# Chih-Hui (John) Ho

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Google Scholar

## Education

- Sep. 2019 - **University of California San Diego, La Jolla, CA.**  
Mar. 2024 PhD in Electrical Computer Engineering  
Advisor: Professor Nuno Vasconcelos
- Sep. 2017 - **University of California San Diego, La Jolla, CA.**  
Jun. 2019 M.S. in Computer Science, GPA: 3.87/4.0
- Sep. 2012 - **National Chiao Tung University, Hsinchu, Taiwan.**  
Jun. 2016 B.S. in EECS Honor Program, GPA: 4.15/4.3

## Research Interest

**Deep Learning & Computer Vision & GenAI:** Publication in top-tier conferences across broad topics, including visual language model, self-supervised learning, anomaly detection, and model robustness

## Professional Experience

- April 2024 - **Applied AI Researcher, Articul8.ai.**  
Now
  - Developed multi-lingual multi-modal GenAI models for image understanding, visual question answering and image-text alignment.
  - Collaborated with engineering team to deliver task-specific large language models, including table analysis and harmful content detection.
  - Designed domain-specific GenAI models, including data curation, large-scale model training and domain-specific benchmark evaluation.
- Jan. 2018 - **Graduate Student Researcher, Statistical Visual Computing Lab, UCSD.**  
Mar. 2024
  - Worked on large foundational models, self-supervised learning, defect detection, and long-tail recognition
  - Collaborated with Korean Polytechnic University and PCB/Tire company for defect detection research
- Jun. 2023 - **Mitsubishi Electric Research Lab (MERL) Research Intern.**  
Sept. 2023
  - Conducted research on industrial anomaly detection using visual language foundational model
  - One paper in submission
- Jun. 2021 - **Amazon AWS Applied Scientist Intern.**  
Sept. 2021
  - Developed a visual grounding transformer model with 1.3x smaller size and 3x faster speed
  - Published a paper in ECCV2022 Workshop
- 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
  - 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.**  
2015
  - 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.**  
2014 Design algorithm to generate image collage based on emotional ROIs

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## Publication and Patent

- 2024 **Chih-Hui Ho**, Kuan-Chuan Peng, Nuno Vasconcelos, "Long-Tailed Anomaly Detection with Learnable Class Names", In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024
- 2024 **Chih-Hui Ho**, and Kuan-Chuan Peng, "Long-Tailed Anomaly Detection in Images", US Patent Application 18/590210, Feb. 28, 2024.
- 2024 Simeng Zheng, **Chih-Hui Ho**, Wenyu Peng, Paul H Siegel, "Flash-Gen: Spatio-temporal generator for flash memory systems", In *IEEE Transactions on Communications*, 2024
- 2024 **Chih-Hui Ho\***, Tz-Ying Wu\*, Nuno Vasconcelos, "ProTeCt: Prompt Tuning for Taxonomic Open Set Classification", In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024
- 2023 **Chih-Hui Ho**, SungBal Seo, NaYeon Kim, Pin-Ying Wu, YouSuk Bae, Nuno Vasconcelos, "Unsupervised PCB Anomaly Segmentation with Foundational Model", Electronic Imaging (EI), Intelligent Robotics and Industrial Applications using Computer Vision, **Oral**, 2024.
- 2023 **Chih-Hui Ho\***, Yuwei Zhang\*, Nuno Vasconcelos, "Toward Unsupervised Realistic Visual Question Answering", In *International Conference on Computer Vision (ICCV)*, 2023, [Paper]
- 2023 Simeng Zheng, **Chih-Hui Ho**, Paul H Siegel, "Modeling Flash Memory Channels Using Conditional Generative Nets", Design Automation and Test in Europe, 2023, [Paper]
- 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. [Paper]
- 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 [Paper]
- 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)

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## 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

Program ECCV2020 Imbalance Problems in Computer Vision Workshop, CVPR2022 Learning with Limited Labelled  
Committee Data for Image and Video Understanding Workshop  
Volunteer CVPR 2020 Area Chair Meeting, San Diego

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## 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, CSE166 Image Processing

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## Selected Projects

- Jan. 2021 - **Defect Detection**, *Pytorch*.  
Mar. 2024
  - o Collaborating with Korea Polytechnic University to detect tire and pcb defects
  - o 2 paper published in EI conference about defect detection using self-supervised learning techniques and segment anything model (SAM)
- Jan. - Mar. 2018 **2018 Kaggle data science bowl**, *Keras*.
  - 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, Numpy, Pandas, OpenCV, Docker, Kubernetes, AWS, Keras, Matlab, L<sup>A</sup>T<sub>E</sub>X

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## Leadership

- 2018-2023 **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 accepted in ICCV23.
- 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. Full Scholarship for an internship in Cornell University  
2014

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

## Exchange Experience

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

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

## Language

Mandarin, English