# WILLIAM HUANG

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## EDUCATION

**University of California, Los Angeles** September 2024 – Present
M.S./Ph.D. in Electrical and Computer Engineering *Los Angeles, CA*

**University of California, Los Angeles** September 2020 – June 2024
B.S. in Computer Engineering, *Cum Laude* (GPA: 3.92/4.00) *Los Angeles, CA*

## RESEARCH EXPERIENCE

**University of California, Los Angeles** December 2021 – Present
Research Assistant, Advised by Prof. Yang Zhang *Los Angeles, CA*

- Design data-driven approaches for personalizing mobility technologies through human-centric AI simulations.
- Simulated motor unit recruitment in hand fatigue through physics simulations of user movements in MuJoCo.
- Developed a configurable synthetic data generator in Unity for human-centric computer vision in wheelchair users.
- Demonstrated the validity of fine-tuning computer vision models with synthetic wheelchair user data to improve pose estimation (mAP +7.64%) and human detection (mAP +98.21%) performance on wheelchair users.

**University of California, Los Angeles** February 2023 – December 2023
Research Assistant, Advised by Prof. Vwani P. Roychowdhury *Los Angeles, CA*

- Tested and documented the user experience of a novel neural signals processing application for spike detection.
- Optimized training time and cleaned code of motion generation models through GPU acceleration.
- Led effort to unify 43 hours of SMPL motion capture sequences and labels into 6D joint representation.

**University of California, Los Angeles** September 2020 – July 2021
Research Assistant, Advised by Prof. Xiang 'Anthony' Chen *Los Angeles, CA*

- Analyzed predictors of problem gambling through time series anomaly detection in the activity of users on daily fantasy sports to discover correlations between "sawtooth" shaped activity trends and gambling addiction.
- Investigated ensemble machine learning algorithms to identify and predict problem gambling activity.

**University of California, Irvine** June 2020 – June 2021
Research Assistant, Advised by Prof. Edwin S. Monuki *Irvine, CA*

- Developed a human-centered annotation tool to categorize morphologies of Biondi bodies, reducing data collection time by 70% and reducing repetitive wrist strain.
- Designed a full user experience and relevant annotation tools to sample and count vacuoles in glial cells.
- Developed a data standard and pipeline for deep learning classification of biondi bodies, unifying over 15,000 prior manual annotations from 50 trials and all future works.

## PUBLICATIONS

**William Huang**, Sam Ghahremani, Siyou Pei, and Yang Zhang. "WheelPose: Data Synthesis Techniques to Improve Pose Estimation Performance on Wheelchair Users". In: *Proceedings of the CHI Conference on Human Factors in Computing Systems*. CHI '24. New York, NY, USA: Association for Computing Machinery, May 2024, pp. 1–25. ISBN: 9798400703300. DOI: 10.1145/3613904.3642555.

Deborah K. Fagan, Anastasia Bernat, Brett C. Simpson, Randy K. Tran, John Wilson, **William Huang**, Clara L. Stickney, David LePoire, Mark MacDonald, R. D. Hildebrand, and Hoffman Edward. "Sample Planning for Transportation Accident Environmental Characterization Using RISKIND and VSP". In: *Proceedings of the Waste Management Symposia*. WMS 2024. Phoenix, AZ, USA: Waste Management Symposia, Mar. 2024.

Michael J. Neel, Brett A. Johnson, Natarsha Vukalovich, Parastou Porahang, Chloe Zhao, **William Huang**, Sam Ghahremani, Andy Lin, Olivia Sandhu, Binh Nguyen, Kasra Pejhanfar, Joni L. Ricks-oddie, Peter Chang, and Edwin S. Monuki. "Biondi body amyloid is spatially clustered in the human choroid plexus: A manual and deep learning-based study". In: *Manuscript in preparation* (2024).

Michael J. Neel, Brett A. Johnson, Todd Soo, Irene Nguyen, Natarsha Vukalovich, **William Huang**, Sam Ghahremani, Kimia Keshvardoot, Shuhao Chen, Zhohaer Muttalib, Seongjoon Won, Sara Khan, Michael Phelan, and Edwin S. Monuki. "Individual and Alzheimer's disease-related differences in Biondi body amyloid morphologies in human choroid plexus epithelial cells". In: *Manuscript in preparation* (2024).

Brett A. Johnson, Michael J. Neel, Todd Soo, Parastou Porahang, Frances A. Goyokpin, Sara Khan, Ryan S. Salehi, Nicolas B. Maramica, **William Huang**, Sam Ghahremani, Peter Chang, and Edwin S. Monuki. "Lipid storage by the human choroid plexus". In: *Manuscript in preparation* (2024).

Michael J. Neel, Brett A. Johnson, Jessica M. Yeung, Aarij Gora, Ashley Nguyen, Juslyn Chan, Victoria Espericueta, Sam Ghahremani, **William Huang**, Jonathan Zebroski, Jackson Sousa, Nathan Schacherl, Kean Ehsani, Christina M. Magana-Ramirez, Peter Chang, Daniel Gillen, and Edwin S. Monuki. "Negative association between nodular stromal fibrosis and large lipid droplets in human choroid plexus epithelial cells". In: *Manuscript in preparation* (2024).

## POSTERS, DEMOS, EXTENDED ABSTRACTS

**William Huang**, Sam Ghahremani, Siyou Pei, and Yang Zhang. *Users in Wheelchairs (UIW) - a human centered RGB dataset of wheelchair users*. 2023.

Caitlin K. Chen, Kassidy M. Ford, Leela M. Wong, Eric L. Zhao, **William Huang**, and Daniel Eisenberg. *Differences in drug and alcohol consumption among college students during the COVID-19 pandemic*. 2022.

## PROFESSIONAL EXPERIENCE

**Pacific Northwest National Laboratory** June 2023 – December 2023
Applied Decisions Systems and Analytics Intern *Virtual / Richland, WA*

- Optimized big data processing of always-on gas, temperature, humidity, and pressure sensor arrays through high performance computing to reduce processing time by 97% and enable aggregate analytics.
- Co-authored an analysis on spatial plume distributions of particulate spread in waste transportation accidents.
- Conducted software testing of energy resilience model (NAERM) web services for deployment to energy partners.

**Intel Corporation** January 2022 – September 2022
Biomechanics Co-Op *Virtual / Santa Clara, CA*

- Extracted baseball, golf, running, performance metrics using posture data from single camera video capture.
- Fused 2D and 3D posture data to address poor prediction performance in elderly populations for rehabilitation data capture, reaching an accuracy of 98%.
- Designed filtering algorithms for noisy posture data to improve the accuracy of high speed angular data by 20%.
- Managed the first on-site commercial release of Intel 3D Athlete Tracking motion capture rig and software.

**UCLA Athletics** December 2020 – January 2022
Data Analytics and Sports Science Project Lead *Los Angeles, CA*

- Led 20 data consultants to provide data science and engineering support for 19 UCLA NCAA D1 athletic teams.

- Engineered a data pipeline to manage athlete wellness data through Sparta, AWS, and Microsoft Azure.
- Designed PowerBI dashboards on each athlete's daily performance for load management and injury prevention.

**National Institutes of Health – Office of AIDS Research** June 2021 – August 2021
Data Science Fellow *Virtual / Bethesda, MD*

- Developed an unsupervised classification algorithm through Doc2Vec to analyze and assign topical labels for submitted grant proposals to aid in reviewer selection, accurately replicating 80% of human-reviewed labels.
- Cleaned and compiled HIV/AIDS grant proposal data from a 13-year period to format into an unified database.
- Conducted and visualized network analysis on PI and institution collaboration across HIV/AIDS research.

## HONORS AND AWARDS

**Third Place, Education Track** – QWER Hacks 2021
**Beckman Legacy Awardee ($8,000)** – Beckman Foundation 2020

## SKILLS

**Languages:** English (native), Mandarin (beginner)
**Programming Languages:** Python, C, C++, C#, SQL, MATLAB, R, JavaScript, HTML, CSS,
**Mixed Reality and Modeling:** Unity, Oculus Quest v1/v2, MuJoCo, Blender
**Data Science:** NumPy, Pandas, Matplotlib, Seaborn, Tableau, PowerBI
**Machine Learning:** SkLearn, PyTorch, Tensorflow, NLTK

## SELECTED OUTREACH

**Sports Analytics Outreach Head**, UCLA DataRes 2021 – 2022
**Curriculum Developer and Python Instructor**, ACM Teach LA 2020 – 2021