# William Huang

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## Education

**University of California, Los Angeles (UCLA)** *September 2020 – June 2024*

BS in Computer Engineering *Los Angeles, CA*

- **GPA:** 3.92
- **Courses:** Algorithms and Complexity, Discrete Structures, Probability and Statistics, Introduction to Data Science, Systems and Signals, Neural Signals Processing, Digital Humanities, Digital Mapping and GIS, Internet of Things, Systems Design, Software Construction

## Research Experience

**UCLA – Human-Centered Computing and Intelligent Sensing Lab** *December 2021 – Present*

Research Intern *Los Angeles, CA*

- Integrated pose estimation models in VR to quantify the accuracy of replicating a given hand motion for applications in VR education.
- Simulated motor unit recruitment in hand fatigue through physics simulations of predefined user movements in Mujoco.
- Developed a configurable synthetic data generation pipeline for wheelchair users using no real-world data to generate images and annotations.
- Demonstrated the validity of fine-tuning pose estimation models with synthetic wheelchair user data to improve performance on wheelchair users.

**UCLA – Roychowdhury Group** *February 2023 – Present*

Research Intern *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 with trajectory data through reduction of GPU-CPU data transfers.
- Preprocessed 43 hours of motion capture sequences into their corresponding XYZ and rotational joint representations and labels model training.

**UCLA – Human-Computer Interaction Research Group** *September 2020 – July 2021*

Learning by Research Student *Los Angeles, CA*

- Analyzed predictors for problem gambling in the activity of users on daily fantasy sports and discovered a potential correlation between ”sawtooth” shaped activity trends and gambling addiction.
- Investigated ensemble machine learning algorithms for application in identifying and predicting problem gambling activity.

**University of California, Irvine (UCI) – Monuki Lab** *June 2020 – June 2021*

Research Intern *Irvine, CA*

- Cleaned and unified over 15,000 annotations from 50 trials to fit modern laboratory standards and data pipeline integration.
- Developed a human-centered annotation tool to categorize specific morphologies of Biondi bodies, reducing data collection time by 70%.
- Designed a full user experience and relevant annotation tools for the sampling and counting of vacuoles from HDF5 files.
- Rewrote and directed training curriculum, shortening training time by 30% for the categorization of Biondi body morphology in virtual settings.

## Publications

### Manuscripts in Preparation / Submission

**WheelPose: Data Synthesis Techniques to Improve Pose Estimation Performance on Wheelchair Users**
**William Huang**, Sam Ghahremani, Siyou Pei, Yang Zhang
*Manuscript in submission*, 2023

**Lipid storage by the human choroid plexus**
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, Edwin S. Monuki
*Manuscript in preparation*, 2023

**Individual and Alzheimer’s disease-related differences in Biondi body amyloid morphologies in human choroid plexus epithelial cells**
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, Edwin S. Monuki
*Manuscript in preparation*, 2023

**Biondi body amyloid is spatially clustered in the human choroid plexus: A manual and deep learning-based study**
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, Edwin S. Monuki
*Manuscript in preparation*, 2023

**Negative association between nodular stromal fibrosis and large lipid droplets in human choroid plexus epithelial cells**

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, Edwin S. Monuki

*Manuscript in preparation*, 2023

**Action-Conditioned Realistic Motions Generation in Sketches from 2D Trajectories**

Yipeng Zhang, Yuanyi Ding, Mingjian Lu, **William Huang**, Qiujing Lu, Vwani Roychowdhury

*Manuscript in submission*, 2023

### Posters, Demos, Extended Abstracts

**Users in Wheelchairs (UIW) - A Human Centered RGB Dataset of Wheelchair Users**

**William Huang**, Sam Ghahremani, Siyou Pei, Yang Zhang

*UCLA Summer Undergraduate Research Program Research Journal*, 2023

**Differences in Drug and Alcohol Consumption Among College Students During the COVID-19 Pandemic**

Caitlin K. Chen, Kassidy M. Ford, Leela M. Wong, Eric L. Zhao, **William Huang**, Daniel Eisenberg

*2022 UCLA Undergraduate Research Week*, 2022

## Selected Work Experience

**Pacific Northwest National Laboratory** *June 2023 – Present*

Applied Decisions Systems and Analytics Intern *Virtual / Richland, WA*

- Optimized data cleaning of large datasets (100 million rows+) through high performance computing techniques to reduce processing time by 97%.
- Co-authored a statistical analysis on spatial plume distributions of particulate spread through IoT data from wearables.

**Intel Corporation** *January 2022 – September 2022*

Biomechanics Co-Op *Virtual / Santa Clara, CA*

- Developed sports specific modules using pose estimation data to compute related performance metrics with an accuracy of 98% in over 300 tests.
- Designed a new filtering algorithm for noisy pose estimation data to improve the accuracy by of high speed angular data by 20%.
- Managed the first commercial release of Intel 3D Athlete Tracking motion capture and software, acting as an on-site technician and aid.

**UCLA Athletics** *December 2020 – January 2022*

Data Analytics and Sports Science Project Lead *Los Angeles, CA*

- Led a team of 20 data consultants to provide data science and data engineering support for 19 UCLA NCAA D1 athletic teams.
- Engineered a full end-to-end data pipeline to manage athlete wellness and workout data through Sparta, Bridge, Catapult, and Microsoft Azure.
- Designed PowerBI dashboards on an athlete's daily performance and surveyed wellness 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 in reviewer selection, accurately assigning labels on 80% of tested grant proposals.
- Cleaned and compiled HIV/AIDS grant proposal data from a 13-year period to format into an extendable and unified database.
- Conducted and visualized network analysis on PI and institution collaboration across the HIV/AIDS research community.

## Honors and Awards

**Dean's Honors List**, UCLA *2020 – 2023*

**Third Place**, QWER Hacks Education Track *2021*

**Beckman Legacy Awardee**, Orange County Beckman Legacy Award *2020*

## Volunteer Experience

**Self–Employed** *June 2019 – June 2021*

Volunteer Tutor *Virtual / Irvine, CA*

- Provided free college application, SAT, and math tutoring for students in need, writing over 50 unique lessons and free SAT study guides.
- All SAT students saw a 120+ point improvement in their SAT score under my tutelage.

**UCLA ACM Teach LA** *October 2020 – June 2021*

Curriculum Developer and Python Instructor *Virtual / Los Angeles, CA*

- Wrote an 11-week advanced Python course for middle schools in the Los Angeles area, emphasizing fun and hands-on projects and lessons.
- Taught an 11-week introductory Python course covering fundamental programming concepts to 35 middle school students.