

# William Wang

Pasadena, CA | (213) 675-1449 | whw2112@columbia.edu

Personal Website: [wwang22.com](http://wwang22.com)

## EDUCATION

---

### Columbia University, Fu Foundation School of Engineering and Applied Science

Bachelor of Science, Electrical Engineering

Relevant Coursework: Analog Electronic Circuits, Computer Architecture, Digital VLSI Circuits, Advanced Logic Design, Advanced Programming

New York, NY

Expected May 2027

## RESEARCH EXPERIENCE

---

### ROAM Lab, Columbia University

In-Hand Manipulation w/ Raw Tactile Signals

New York, NY

Jan 2025 - Present

- Designed a multi-modal behavior-cloning transformer that integrates visual, proprioceptive, and tactile signals to predict action sequences.
- Trained a robust in-hand manipulation policy with a dexterous hand using raw tactile signals performing 10-14x better than RL baseline.
- Learned tactile policy kept a spinning lugnut aloft for  $\approx 180$  s from near-failure grasps versus 13 s for the RL baseline and outperformed it across all tested start heights (178 s vs 103 s at high grasp, 196 s vs 174 s nominal).

### SLURM Lab, USC

VLM Integrated Robot-to-Human Handover Pipeline

Los Angeles, CA

Summer 2025

- Trained a robust RL in-hand rotation policy on the Allegro and LEAP hand that can generalize to unseen objects using an adaptation policy and an object semantics policy to predict privileged information using tactile signals and depth-based point cloud.
- Designing a VLM-guided pipeline that directs low-level policies for robust in-hand manipulation and robot-to-human handovers (ongoing).

## INTERNSHIPS

---

### MeetKai

Software Engineering Intern

Los Angeles, CA

Summer 2023

- Designed and implemented a browser-based driving simulator in Rapier.js, integrating Pacejka's magic formula for tire physics; tuned  $>20$  parameters to balance realism with playability, resulting in smooth, responsive driving across desktop and mobile.

### SpaceX

Incoming GNC Software Engineering Intern

Hawthorne, CA

Spring 2026

## PROJECTS

---

### 3D Gaussian Renderer

C++/CUDA

New York, NY

Fall 2025

- Implemented and benchmarked OneSweep in CUDA; achieved 10x-20x performance increase compared to NVIDIA CUB sort at higher array lengths ( $N > 6$  billion) and benchmarked with naïve implementation of RADIX sort achieving over 100x-200x performance increase.
- Built a high-performance 3D/4D (spacetime) Gaussian renderer; implemented GPU preprocessing (view-frustum culling, tiling, sort-by-tile) and an interactive OpenGL viewer (orbit/zoom, live HUD).

### Simple "Microprocessor" Core Design and Layout

VLSI / Cadence Virtuoso

New York, NY

Fall 2025

- Designed and laid out tiny microprocessor core with 8 bytes of SRAM memory, an 8-bit ripple-carry adder, an 8-bit logarithmic left shifter, an espresso-optimized PLA opcode decoder, and control logic; the whole design passes DRC and LVS checks with TSMC n65 technology.
- Sized transistors and optimized layout design to achieve a max operating speed of  $\approx 265$  MHz; simulations were done with UltraSim.

### Discrete Convolution FIR Filter

Verilog / PrimeTime

New York, NY

Spring 2025

- Built a 64-tap, 16-bit fixed-point FIR filter core in synthesizable Verilog; synthesized RTL to gate-level netlist and verified functionality.
- Designed and tested a clock-domain crossing synchronizer / FIFO, ensuring metastability under asynchronous clocks.
- Performed post-synthesis power analysis in PrimeTime using switching activity from simulation (VCD) to estimate dynamic/leakage power.

### P6 Style Out-of-Order Processor

SystemVerilog

New York, NY

Spring 2025

- Implemented an out-of-order RISC-V core (P6 style) in SystemVerilog with register renaming (32-entry map table), a 32-entry reorder buffer, multi-entry reservation station and common-data bus.
- Architected the memory subsystem: an 8-entry unified Load-Store Queue for speculative loads plus a non-blocking, write-back D-cache with dirty-line eviction; delivered a 99.8% hit rate on the search-and-sort workload and kept CPI as low as 3.8.

More projects on website: [wwang22.com/projects](http://wwang22.com/projects)

## PUBLICATIONS

---

Chang, E. T., Ballentine, P., He, Z., Kim, D., Jiang, K., Liang, H. H., Palacios, J., Wang, W., Piacenza, P., Kymissis, I., & Ciocarlie, M (2026). SpikeATac: A Multimodal Tactile Finger with Taxelized Dynamic Sensing for Dexterous Manipulation. Submitted to IEEE International Conference on Robotics and Automation (ICRA **under-review**).