# Zhiyu (Iris) Ren

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## EDUCATION

**Cornell University,** College of Engineering, Ithaca, NY **Expected May 2026**
Bachelor of Science in Mechanical Engineering, Minor in Design & Environmental Analysis, GPA 3.907
**University of California, Santa Barbara** College of Arts and Science, Goleta, CA **Sep 2021-Jun 2023**
Bachelor of Science in Environmental Studies, GPA 3.94

## RESEARCH EXPERIENCE

**Biodegradable Pressure Sensor, NUS**, *Research Intern* **May 2025-Jul 2025**

- Developed a 1.5mm-high sustainable pressure sensor with kombucha bacterial cellulose and recyclable magnets
- Conducted a 21-day biodegradation test on KBC sensor components to assess material biocompatibility
- Integrated optimized pressure sensors into functional insole devices contributing to a published research article

**SEA Lab,** Cornell University, Multidisciplinary Design Optimization Team, *Researcher* **Jan 2024-Aug 2024**

- Manufactured parts for RM3 and RM5 wave energy converter by laser cut and 3D printing
- Generated analysis figures and refined simulation code for WEC hydrodynamic models
- Improved model outputs using gradient-based and pattern-search optimization algorithms

**Cheadle Center for Biodiversity and Ecological Restoration**, Goleta, CA, *Researcher* **Jan 2023-Mar 2023**

- Researched hypothesis to examine the relationship between bee morphology and climate change
- Built a dataset of 951 dorsal and multi-view bee specimen images for morphological analysis
- Measured intertegular spans for 152 bee specimens and uploaded them into Zooniverse, a digitalized system

## PROJECT

**Global Action Impact Association**, Cornell University & Trujillo, Peru, *Project Member* **Aug 2023-Present**

- Designed and adapted wind-turbine electronics for integration with solar-charge controllers
- Secured local sourcing in Trujillo and finalized an electronic design system under $305
- Developed a long-lasting data-collecting system for vibration of bicycles from World Bicycle Relief, achieving over 65% data capture reliability in field experiments.

**Computer Vision for Digital Farming & Agricultural Robotics,** Cornell university, *Designer* **Aug 2024-May 2025**

- Built a phone-mounted laser scanning system enabling farmers to measure vine-pruning weight at a five-foot range
- Integrated modular dovetail system to enable the sliding engagement between robot Z-axis rail and toolhead
- Designed 3D-printed mechanical mounts for sensors and timers enabling real-time measurement of soil moisture

**Cornell University Sustainable Design**, Soil Factory Subteam, *Subteam Member* **Aug 2023-May 2024**

- Conducted burnings to produce biochar and analyzed the deficiency of kiln design and combustion process
- Researched and optimized the kiln design, reducing 30% burning smoke and retaining nutrients in biochar
- Implemented experiment to testify biochar's capacity to prevent soil erosion and reduce salinity

## EXCURRICULAR

**Engineering Competitors for Sustainability**, Cornell University, *Club President* **Jan 2024-Aug 2025**

- Established the club from inception, recruiting 70% initial members and securing faculty advisor approval
- Organized six-month technical workshops and arranged venues for annual competition days
- Communicated with competition organizations to orient the club activities in preparation for new competition

## PUBLICATION

Chan, X.Y., Sun, X., Pang, E.Y.L., **Ren, I.Z.**, Zhang, X., Chen, P., & Tan, Y.J. (2025). From Grave to Cradle: Kombucha Waste for Sustainable Electronics. Advanced Science (Wiley-VCH). https://doi.org/10.1002/advs.202514521

## HIGHLIGHTS

**Prototyping:** 3D printing, Laser cutting, Waterjet Cutting, Drill press.
**Software:** Fusion 360, AutoCAD, Rhino, Revit, Ansys, MATLAB, Linux, LabVIEW, Python, R, C++.