

Zhe Wee (Derrick) NG

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🐙 **GitHub:** www.github.com/NGZheWee/ZheWee-NG-Portfolio/

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Education

University of California, Berkeley

BA in Computer Science

August 2023 - Expected May 2025

University of California, San Diego

Transferred Credits towards Computer Science Degree

September 2020 - May 2023

Research Experience

Research Assistant – Berkeley Engineering Design Scholars Program & Co-Design Lab

Jacobs Institute for Design Innovation & Department of Mechanical Engineering, UC Berkeley

June 2024 – Present

- Leading research on sustainable design, started during the [Berkeley Engineering Design Scholars Program](#), and continuing under the [Co-Design Lab](#) with Dr. Kosa Goucher-Lambert.
- Analyzed sustainable design opportunities using natural language processing (NLP) on certification data and customer reviews, delivering insights on how certifications affect consumer perceptions.
- Developed web scraping tools with DrissionPage, Selenium, and BeautifulSoup to extract and analyze Amazon product data, automating pagination, login, and data extraction with error handling.
- Conducted sentiment analysis comparing LLMs, BERT, and VADER using correlation matrices and aspect-based analysis with keyword matching in Python. Applied LDA topic modeling to assess customer perceptions and inform sustainable design strategies.

Independent Research – Predictive Maintenance Modelling (Manuscript Under Review)

April 2024 – Present

- Conducted independent research on predictive maintenance, developing Long Short-Term Memory (LSTM) networks to forecast equipment failures and improve maintenance strategies in industrial settings.
- Implemented machine learning models in Python, achieving enhanced predictive accuracy and reduced downtime compared to traditional maintenance approaches.
- The research has been documented in a manuscript, *Enhanced Equipment Reliability Through Predictive Maintenance Modeling: A Machine Learning Approach*, which is currently under peer review.

Multimodal Single-Cell Integration Kaggle Competition (Silver Award)

September 2022 - December 2022

- Collaborated in a team of 5 to develop predictive models analyzing covariation among DNA, RNA, and protein measurements in single cells.
- Utilized Python and R for model development, employing XGBoost, Random Forest, and Neural Networks.
- Achieved a top 5% ranking (24th out of over 2,000 teams) and secured a Silver Award, demonstrating strong analytical and problem-solving skills.

International Genetically Engineered Machine Competition (Silver Award)

July 2019 - September 2019

- Led the design and implementation of a BioBrick part using CRISPR-Cas9 technology to target Human Papillomavirus (HPV) and cervical cancer.
- Conducted PCR, plasmid construction, cell transfection, and mass spectrometry-based proteomics to create and validate a functional prototype of the BioBrick part.
- Secured a Silver Award at the iGEM Competition, ranking in the top 20 out of over 100 entries for innovative synthetic biology solutions, demonstrating the prototype's potential for early diagnosis and treatment.

Work Experience

Web Development Engineer (Internship)

AoSheng Global Inc., El Monte, CA, U.S.A

September 2023 - December 2023

- Developed and implemented adaptive websites using HTML, CSS, and JavaScript, ensuring cross-platform compatibility.
- Optimized performance by employing algorithms to enhance loading times and responsiveness.
- Applied UI/UX design principles to create intuitive, visually appealing interfaces, enhancing user engagement.
- Participated in strategic development meetings, providing insights on web technology trends to influence the company's digital strategy.

Data Analyst (Internship)

Hironpal Holdings, Singapore

March 2022 - August 2022

- Utilized SQL within the ERP system to analyze sales and inventory data, developing automated reporting tools like inventory turnover reports and stock level alerts, which streamlined inventory management processes and reduced holding costs.
- Developed sales and revenue forecasting models using Python, applying linear regression and KNN algorithms against historical sales data, customer purchasing patterns, and market trends.
- Implemented A/B testing using Google Optimize to compare the effectiveness of different marketing strategies, leading to improved prediction accuracy and actionable insights into customer behavior.
- Collaborated with the marketing team to leverage data insights for product selection and market positioning, optimizing advertising strategies for various demographics, which resulted in increased campaign ROI.

Test Engineer (Internship)

Serica Semiconductor Technology, Beijing, China

November 2021 - January 2022

- Conducted simulations in ModelSim to verify the functionality and stability of Phase-Locked Loop (PLL) circuits, analyzing frequency and phase noise characteristics to ensure compliance with specified parameters.
 - Developed and executed C test scripts to validate RSA encryption/decryption functions using the OpenSSL library, comparing outputs against expected results with a series of test vectors.
 - Utilized thermal imaging tools to identify PCB hot spots, and collaborated with ANSYS Icepak to simulate thermal performance, optimizing thermal pad placement to enhance heat dissipation and maintain optimal operating temperatures.
- Employed an oscilloscope to measure signal integrity on PCIe lanes, addressing signal distortions, reflections, and crosstalk by adjusting trace routing and impedance matching for clean and stable signals.

Venture Capital Analyst (Internship)

JinDing Capital, Shanghai, China

May 2020 - December 2020

- Conducted comprehensive analyses of technology sector trends, focusing on advancements in DPU, CPU, semiconductors, and software management services by consulting with industry experts and examining market data to identify promising investment opportunities.
- Evaluated the potential of technology firms' products, such as machine vision systems and magnetoencephalography devices, by assessing their development stages and technical specifications. Prepared in-depth reports and presentations for senior management.
- Assessed tech firms' overall business potential using qualitative methods to examine their process models, development methodologies, and management practices, and quantitative methods such as financial modeling and valuation techniques to determine financial viability and inform strategic investment decisions.

Skills

- **Communication:** Effective communication, conflict resolution, bilingual (English and Mandarin Chinese)
- **Project Management:** Coordinating research projects, evaluating technology trends, strategic planning and decision-making
- **Programming Languages:** Python, Java, C, R, MATLAB, JavaScript, HTML, CSS
- **Programming Techniques:** Data structures, algorithm design and evaluation, software engineering principles
- **Data Analysis:** SQL data management, predictive modeling (Linear Regression, KNN, XGBoost, Random Forest, Neural Networks)
- **Database Systems:** Full-stack database system design and evaluation, database services including protection and integrity control
- **Web Technologies:** Web scraping (DrissionPage, Selenium, BeautifulSoup, pandas), UI/UX design, performance optimization, adaptive web development
- **Artificial Intelligence:** Foundational AI principles, machine learning methodologies, aspect-based sentiment analysis, LDA topic modeling, correlation matrix analysis
- **Cryptography:** Theoretic foundations of cryptography, encryption/decryption methods, secure communication protocols
- **Computer Architecture:** Digital logic design, ModelSim for simulations, ANSYS Icepak for thermal analysis, oscilloscopes for signal integrity measurement, OpenSSL for encryption/decryption validation