

Zhe Wee (Derrick) NG

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🐙 **GitHub Portfolio:** 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.
- Developed automated web scraping tools using DrissionPage and BeautifulSoup to extract and analyze Amazon product data.
- Applied advanced NLP methods in Python to analyze certification data and customer reviews. Techniques included aspect-based sentiment analysis with LLMs like BERT and VADER, LDA topic modeling, and evaluation of model performance through correlation matrices. Provided insights on how certifications impact consumer perceptions, informing sustainable design strategies.

Independent Research – Predictive Maintenance Modelling (Manuscript Under Review)

April 2024 - Present

- Conducting research on predictive maintenance to enhance equipment reliability in industrial settings.
- Developed and implemented Long Short-Term Memory (LSTM) neural networks in Python to forecast equipment failures using time-series data. Achieved improved predictive accuracy and reduced downtime compared to traditional maintenance approaches by evaluating model performance with metrics like mean squared error and precision-recall analysis.
- Authored a manuscript titled "*Enhanced Equipment Reliability Through Predictive Maintenance Modeling: A Machine Learning Approach*", 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 among over 2,000 teams by securing the 24th lowest error score on the test dataset, earning a Silver Award.

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).
- Conducted laboratory techniques including 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, demonstrating the prototype's potential for early diagnosis and treatment of HPV.

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 tailored to the education consulting industry to create intuitive interfaces, enhancing client 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. Developed automated reporting tools, including inventory turnover reports and stock level alerts, to streamline inventory management processes.
- Developed sales and revenue forecasting models using Python, applying linear regression and KNN algorithms to analyze historical sales data, customer purchasing patterns, and market trends.
- Implemented A/B testing using Google Optimize to compare the effectiveness of various marketing strategies, resulting in improved prediction accuracy and providing actionable insights into customer behavior.
- Collaborated with the marketing team to leverage data insights for product selection and market positioning, optimizing advertising strategies for diverse demographics, and increasing campaign ROI.

Test Engineer (Internship)

Serica Semiconductor Technology, Beijing, China

November 2021 - January 2022

- Conducted simulations using ModelSim to verify the functionality and stability of PLL circuits. Analyzed frequency and phase noise characteristics to ensure compliance with specified technical parameters.
- Developed C test scripts to validate RSA encryption and decryption functions utilizing the OpenSSL library. Compared outputs against expected results using predefined test vectors to ensure accuracy and reliability.
- Utilized thermal imaging tools to identify PCB hot spots and employed ANSYS Icepak simulations to optimize thermal pad placement, enhancing heat dissipation.
- Employed an oscilloscope to measure signal integrity on PCIe lanes. Mitigated signal distortions and crosstalk by optimizing trace routing and impedance matching, resulting in clean and stable signal transmission.

Venture Capital Analyst (Internship)

JinDing Capital, Shanghai, China

May 2020 - December 2020

- Conducted analyses of technology sector trends by consulting with industry experts and examining market data to identify promising investment opportunities in DPU, CPU, semiconductors, and software management services.
- Assessed tech firms' business potential using qualitative methods (examining process models, development methodologies, management practices) and quantitative methods (financial modeling, valuation techniques) to determine financial viability and inform strategic investment decisions.
- 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.

Skills

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