

ZHEN-DE CHEN

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SUMMARY

Strategic Process & Automation Engineer with a dual background in mechanical systems and data science. Proven excellence in cross-functional leadership, serving as a key liaison between R&D, production, and international vendors to resolve critical equipment integration issues. Expert at translating complex analytical logic into actionable strategies for technical and non-technical stakeholders. Focused on leveraging AI-driven diagnostics and process control to eliminate abnormalities and maximize operational efficiency.

EDUCATION

AI & Data Analytics Excellence Program | *NYCU, Taiwan* Dec 2025 – Mar 2026

- 278-hour intensive program covering applied statistics, end-to-end machine learning workflows, business intelligence, regression/ANOVA, clustering, association rules, dimensionality reduction, time-series forecasting, and SVM.

MSc in AI and its Applications | *University of Essex, UK* Oct 2022 – Dec 2023

- Advanced coursework in ML, DL, and RL algorithms applied to predictive analytics and decision optimization.

BSc in Mechanical Engineering | *Tatung University, Taiwan* Sep 2015 – Jun 2019

- Built a foundation in mechanical engineering, mechatronics, embedded control, and manufacturing problem solving.

EXPERIENCE

Data Analytics Instructor & Tech Consultant | *Freelancer* Sep 2024 – Oct 2025

- Translated complex data analysis concepts into clear, practical language to support learning and decision-making.
- Explained technical logic and assumptions in a structured way for non-technical audiences.

Process & Automation Engineer | *Star Technologies* Nov 2020 – Aug 2022

- Developed an automated coordinate mapping system and custom fixtures, reducing manual entry errors and ensuring stable, repeatable equipment setup to lower production costs.
- Led production integration and cross-functional troubleshooting for key probe products, serving as a primary liaison between production, R&D, and German equipment suppliers.
- Monitored in-line process abnormalities and tracked work orders; deconstructed production errors to identify root causes and implement effective corrective actions.

PROJECTS

Turbofan Engine Predictive Maintenance *Python - PCA, Mutual Information, RF, XGBoost, DNN, GRU, SVR*

- Built a Remaining Useful Life (RUL) prediction workflow using 33,000+ sensor logs across 21 parameters to **detect early degradation patterns** and support maintenance planning for complex equipment systems.
- Applied feature engineering (PCA, Mutual Information) and benchmarked ensemble and deep learning models to **improve fault-related signal interpretation** from multivariate sensor data.

STM32 & Motor Control System Academic Project *STM32 - HMI, PWM, Stepper Motor Control*

- Developed an **STM32-based HMI** and motion-control workflow for motor-driven equipment, implementing **PWM, stepper motor control**, and precise step timing for stable operation.
- Tuned motion profiles to reduce vibration and improve response stability during acceleration and direction changes, strengthening understanding of electromechanical system behavior.

Electricity Allocation Strategy Optimization *R - Linear Programming, SARIMA, VAR*

- Built a **rolling energy-allocation model** using **Linear Programming** to compare cost-oriented, carbon-oriented, and balanced policy strategies under real-world operating constraints.
- Formulated demand, capacity, and policy rules as a **constraint matrix**, encoding demand balance, source capacity limits, nuclear-share caps, and renewable-mix targets for scenario comparison and variable optimization.

TECHNICAL SKILLS

Precision Engineering: Mechatronics, Precision Alignment, Vacuum Systems, PLC, AutoCAD, SolidWorks.

Control Systems: Motion Control (PWM, Stepper Motor), STM32 (HMI), Arduino, NodeMCU.

Semiconductor Ops: Equipment Integration, Onsite Technical Support, SOP, Quality Control (QC).

Data Science & AI: Predictive Maintenance, Statistical Modeling, Python, R, SQL, Power BI, JMP.

Technical Liaising: Cross-functional Coordination, International Vendor Collaboration (PacTech).

Certifications: DataCamp Data Analyst Associate, Google Cloud Computing Foundations.