Ke WANG

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EDUCATIONAL BACKGROUND

Simon Fraser University Vancouver, BC

Master of Applied Science: Mechatronic Systems Engineering Expected in 04/2026

Simon Fraser University Vancouver, BC

Bachelor of Applied Science: Mechatronic Systems Engineering 09/2017 - 09/2023

Dean's List Honoree 2022 Fall

RESEARCH INTERESTS

AI-driven generative design, machine learning in designs optimization and acceleration

TECHNICAL SKILLS

SOFTWARE: ROS, OpenCV, PCL, Linux, MATLAB and Simulink, Quartus, SolidWorks, STM32, 8051, LabVIEW, RobotStudio (ABB robot), EPLAN, Portal

LANGUAGE: C/C++, Python, scl, lad, Assembly, Verilog

ACADEMIC PUBLICATIONS

- **Ke, W.,** Nguyen, V., Tian, Y., Dastan, M., & Wang, G.* (2025). *RePaint-enhanced Conditional Diffusion Model for Generating Designs under Performance Constraints. Journal of Computing and Information Science in Engineering* (under review).
  Selected for presentation at the ASME IDETC-CIE 2025 Conference.
- Nguyen, V., **Ke, W.,** Gary W.*, (2025). *Effective prompting with ChatGPT for problem formulation in engineering optimization, Engineering Optimization*

ACADEMIC PROJECT

Performance-Oriented Design Generation via Foundation Models 2025-09 to Present

Research Project, Surrey, BC **- Research Assistant**

This project explores the application of *foundation models* for *training-free, performance-guided generative design*, aiming to integrate large-scale pre-trained foundation models into physics-informed design synthesis workflows. This work is expected to produce a journal paper as output.

- Literature review in Generative Models, Parametric Design, Foundation Models and Dataset of Engineering Design
- Experiment design for performance comparison and study of influencing factors
- Coding of major framework of design generation, experiments and data analysis

Compact Selective Laser Melting (SLM) 3D Printer 2023-01 to 2024-06

Capstone Project and Research Project, Surrey, BC **- Mechatronic System Engineer**

- Designed and engineered the hardware system for a compact SLM 3D printer, utilizing Bigtreetech Optopis STM32 controller, stepper motors, and various sensors and switches
- Mechanical design of the main structure, including powder feeding mechanism, powder recoating mechanism and optical components' level modifying mechanism.
- Engineered an embedded control system with a PID loop to modify the PWM control signal of the valve,

maintaining the gas concentration of the internal printing chamber in C language

INDUSTRIAL EXPERIENCE

Hunan Central South Intelligent Equipment Co., Ltd, Hunan, China - Electrical Engineer Intern 2021-07 to 2022-01

Bosch Power Tools (China) Co., Ltd, Zhejiang, China **-** Automation Engineer Intern 2022-02 to 2022-08

INDUSTRIAL PROJECT

Vision-guided Robot Chiseling System 2022-02 to 2022-08

Bosch Power Tools (China) Co., Ltd, Hangzhou, China **- C and Python Programmer, Industrial Robot Programmer**

- Implemented the coordinate transfer function using OpenCV. Utilized multiple photos of the target ArUco mark as input to the "eyes to hands calibration" function, achieving high accuracy transfer matrix to calibrate the camera's coordinate
- Developed the system framework on the Jetson Nano platform using ROS to efficiently manage task assignment, error handling, and safe workflow
- Optimized the communication efficiency by designing a specific data compression algorithm and applying Modbus protocol to transport data packs between the upper computer and the PLC
- Programmed robot motion control logic using KUKA RobotStudio and controller to perform correct test actions and test postures

DC Power Supply Management System for Battery Packs 2022-02 to 2022-08

Bosch Power Tools (China) Co., Ltd, Hangzhou, China **- Electrical Engineer**

- Designed the electrical system to safely charge and discharge 12 battery packs under PLC control. Utilized EPLAN to create electrical diagrams and participated in component selection
- Devised a viable structural design to separate the control cabinet and battery compartment. This design protected the core control components from the harsh working environment
- Developed the main program for the PLC and created a GUI in HMI screen to manage the charging and working condition of each battery pack in Portal using LAD and SCL languages

Handling Robot of Grinding Station in Sinotruk 2021-12 to 2022-01

Hunan Central South Intelligent Equipment Co., Ltd, Jinan, China **- Electrical Engineer, Temporary On-site Leader**

- PLC programming. Used PLC to control the operation of two robots, including the triggering of different handling tasks, roller table control and communication with grinding stations
- Solved the problem of abnormal communication by that applying a PN coupler and hardline signal to protect the transmission from noise signal pollution to ensure the safe operation of equipment

Hole Blowing Robot in Weichai Power 2021-10 to 2022-11

Hunan Central South Intelligent Equipment Co., Ltd, Weifang, China **- Electrical Engineer**

- The construction and programming of the S7 communication with the factory's mainline. Established communication with the customer's on-site main line through the DP coupler, and perform configuration and signal distribution in the PLC
- Debugging and troubleshooting of V90 servo by V-Assistant. Inferred the cause of the fault by interpreting the history error code in the V-Assistant's log and solved the problem by modifying the performance parameters in combination with the actual working scene

LINK

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https://kewang-atn.github.io/