david.bw.cheng@gmail.com

DAVID CHENG

www.linkedin.com/in/davidcheng16

SKILLS

Programming	C++/C, Java, Python, Assembly (8051)
Software	Git, Gitlab, CMake, Linux, Qt Framework, QEMU, MATLAB, Jira, Polarion, Confluence
Embedded	Arduino, ESP32, ESP8266, Raspberry Pi Pico

WORK EXPERIENCE

CNH Industrial Oak Brook, IL

Embedded Software Engineer II – *Guidance Team* July 2024 - Present

- Worked on the guidance backend component in C++, processing operator inputs and real-time data for UI visualization in a Qt application, running on an embedded Linux device using Yocto.
- Led the development of agricultural swath recording features in C++, improving swath creation, selection, and deletion efficiency by 30% through event-driven workflows using Qt signals and slots.
- Accomplished real-time guidance line tracking for the first time on the new proprietary OS by developing swath rendering code, interfacing the swath generation output API with the display API.
- Improved operator setup and load times by 20% by offloading persistence operations to a separate thread, ensuring critical events are handled and displayed to the UI without delay.

Embedded Software Engineer I – *Automatic End-of-Row Turn (AEORT) Project* July 2022 - July 2024

- Led the development of an automated field turn planner that generates the shortest, drivable turns between swaths, by implementing a Dubins-Clothoid-based turning algorithm.
- Designed and proposed a dynamic turn planning solution to address collision turns, dividing them into sub-turns for re-planning, resulting in a formal IP submission.
- Accelerated the transition from proof-of-concept to production by leveraging existing interfaces, enabling rapid algorithm testing on agricultural vehicles via sideloading.
- Documented newly designed software at different levels using Doxygen, Markdown, Mermaid diagrams, ADRs, and Confluence, improving clarity throughout the development process.

PROJECTS

GitHub Portfolio Page: https://daviecheng.github.io/

Wearable Posture Corrector Device, *Self-Project*

- Prototyped and designed a wearable posture-correction device using the SEFR machine learning algorithm to detect and notify users of prolonged slouching.
- Interfaced an accelerometer with a microcontroller over I2C for real-time posture monitoring.
- Extended battery life to 4.5 days by decreasing the system clock frequency and removing unused internal LEDs on the microcontroller.
- **Utilized**: C/C++, Python, Arduino, ATmega328 MCU, Multimeter, Soldering, Fusion 360

EDUCATION

New York Institute of Technology Sept 2017 - May 2022

M.S. Electrical & Computer Engineering GPA: 3.96/4.00

B.S. Electrical & Computer Engineering GPA: 3.89/4.00

Degree Honors: *summa cum laude*, Presidential Honor List (2018-2021)