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Li Tang

Education

Beijing Jiaotong University

2021, Sep – Present

Undergraduate·Class of 2021 (Junior)·Communication Engineering · Tien-Yow Jeme Honors College

- Courses： Advanced Mathematics/Algebra, Digital/Analog Circuits, Communication Principles, Digital Signal Processing, Computer Principles
- Self-study: Automatic Control Principles, Introduction to Robotics, Computational Graphics

Projects

2023 – Present

Partly, visit Github for more

PANCAKE：Distributed Automated Transport Vehicles

High-load capacity 3D printed autonomous vehicle swarm, completed transport tasks using distributed control. Reduced costs by 80% and increased efficiency by 130% at the same time.

- **Lead hardware design.** Complete research, feasibility studies, and schematic design; complete PCB fabrication and electronic hardware debugging.
- **Lead 3D design.** Complete 3D Modeling, 3D printing testing, metal prototyping, and assembly.
- **Lead software development.** Complete embedded software development (STM32+ESP32); establish ROS environment, deploy drivers, and develop software; coordinate hardware-software integration.
- **Lead a team of three** in the "2023-2024 College Students Entrepreneurship and Innovation Competition"; manage project progress and organize regular meetings. **Project is currently under evaluation.**

PIONEER：STM32F103 Smart Vehicle Development Board

Optimized for four-wheel smart car applications, accelerated and improved the tutorials in lab.

- **Contribute to hardware design.** Include chip selection, schematic drawing, layout review, small-scale manufacturing (100 units), and testing phase.
- **Lead software development.** Build STM32 HAL + CMAKE development environment for various peripheral drivers (C/C++), and integrate third-party frameworks like LVGL and FreeRTOS.
- **Conduct lab trainings.** Create both online and offline tutorials and resolve student inquiries.

Brushless Motor Drive Control Board

High performance BLDC driver with FOC algorithm.

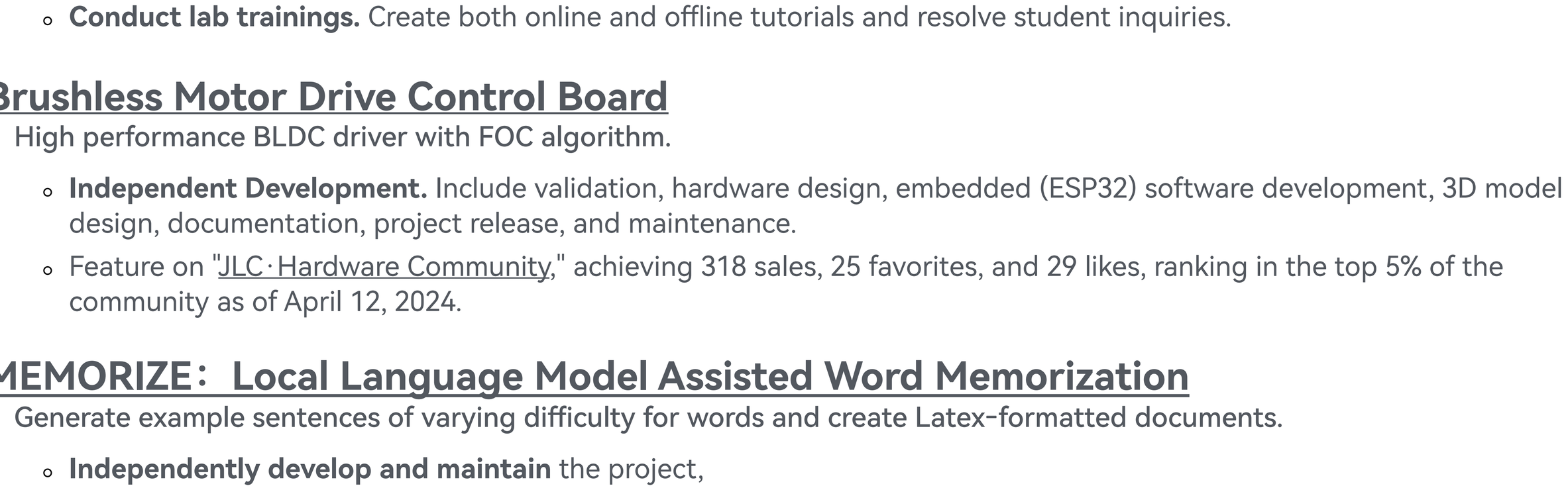
- **Independent Development.** Include validation, hardware design, embedded (ESP32) software development, 3D model design, documentation, project release, and maintenance.
- Feature on "JLC·Hardware Community," achieving 318 sales, 25 favorites, and 29 likes, ranking in the top 5% of the community as of April 12, 2024.

MEMORIZE：Local Language Model Assisted Word Memorization

Generate example sentences of varying difficulty for words and create Latex-formatted documents.

- **Independently develop and maintain** the project,
- Aid me in learning 2100 words in 14 days, preparing for an IELTS exam.

Skill Map



PANCAKE: Distributed Automated Transport Vehicles

High-load capacity 3D printed autonomous vehicle swarm
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Reduced costs by 80% and increased efficiency by 130% at the same time.

Project Target

Disadvantages of Traditional AGV

- High one-time investment
- Limited scene
- Limited goods

Advantages of Distributed Automated Transport Vehicles

- Lower cost at deploy
- Wider scene
- Higher reliability

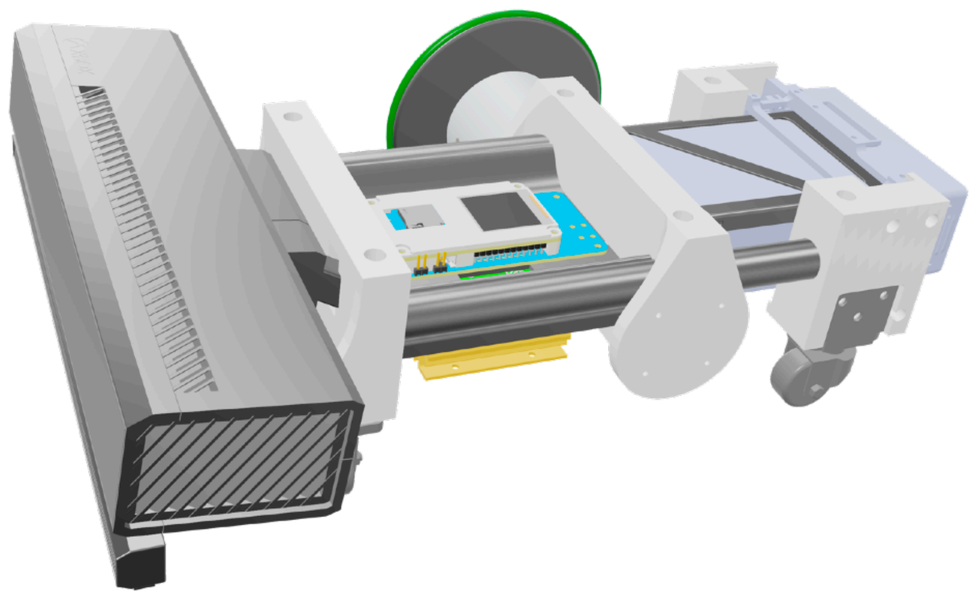
+

Keep Advantages of Traditional AGV

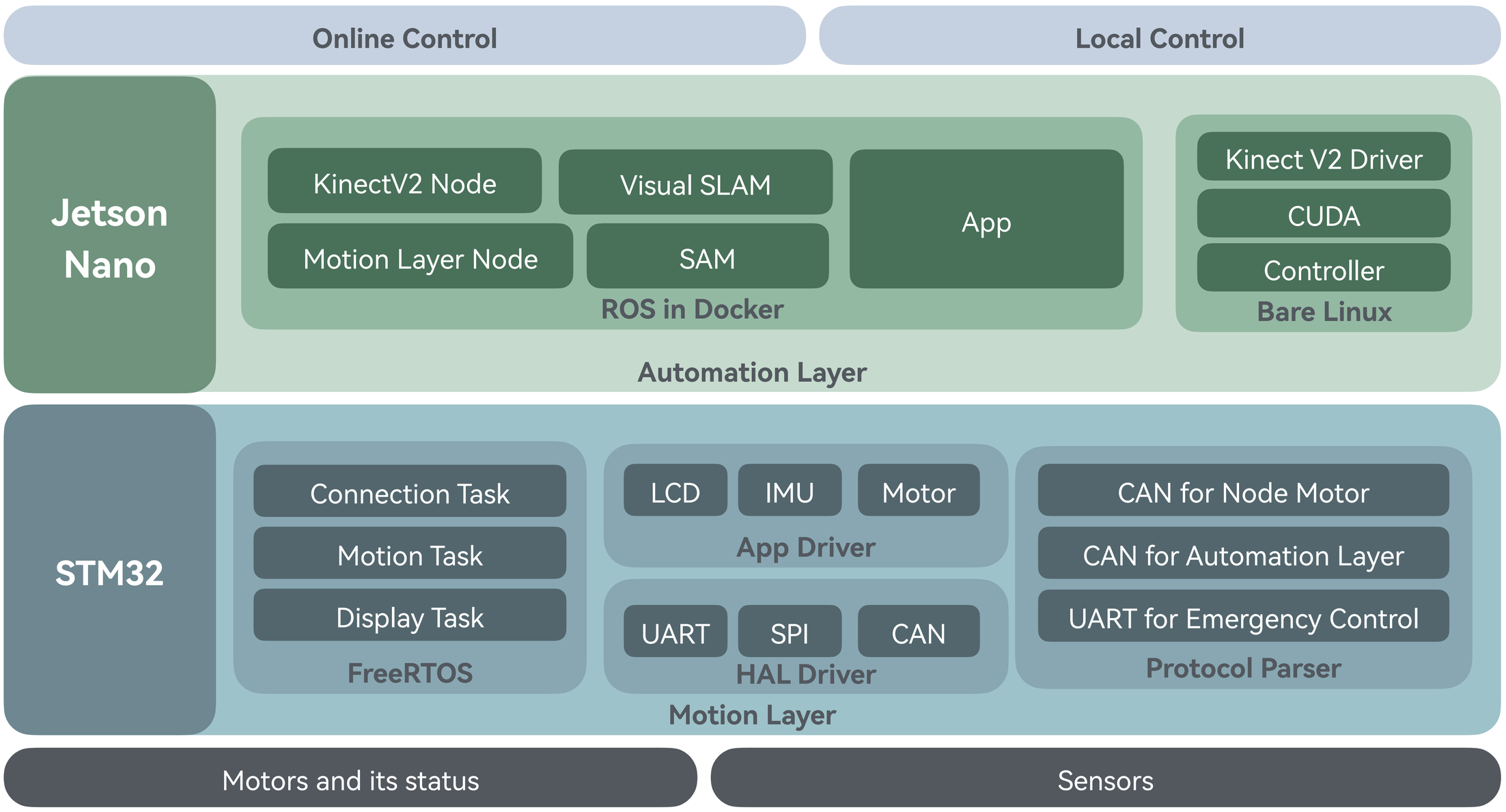
- Reduce costs for labor
- Smart management
- Hight-load capacity

Hardware Solution

- Pioneer STM32 Dev-Board（more on next page）
- Jetson Nano 4G
- BLDC + Planetary reduction gear
- 100% 3D Printed structure parts（parts in white）
- 2x Carbon-fiber tube + Aluminum alloy panel



Software Solution



Demonstration