

# THE KEY TECHNOLOGIES EXPLORATION AND DEVELOPMENT ANALYSIS OF ORCHARD AGRICULTURAL ROBOTS IN SOUTH CHINA —— CASE SHARING

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This study delves into the essential technologies and future development directions of orchard agricultural robots in South China. Within the context of modern agriculture, agricultural robots are regarded as innovative solutions to enhance orchard productivity and address labor shortages. Based on prior research and development of smart weeding robots and pineapple harvesting robots, this report focuses on fundamental mechanical structures, underlying control systems, and intelligent algorithms and modules. Key technical aspects explored include visual recognition, spatial positioning, autonomous navigation, path planning, intelligent control, and multi-sensor fusion. Furthermore, the study integrates these components to conduct reliability verification and experiments. Through demonstration applications and field practices, various bottleneck factors influencing the equipment's market deployment are analyzed incrementally. The conclusions and findings offer robust technological references and practical foundations for the future development of orchard agricultural robots. With continuous technological breakthroughs and innovations, agricultural robots will further evolve towards low-cost, digitized, and intelligent solutions, injecting new vitality into agricultural production.

**Keywords:** South China Orchards, Agricultural Robots, Reliability, Intelligence, Smart Technology, Market application