Hanoi University of Science and Technology
School of Information and Communication Technology

Project Report: Game Tetris using STM32CubeIDE hardware and software

IT4210E - Embedded Systems

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1 Introduction

This project aims to replicate the classic arcade game "Tetris" on an embedded system platform. The primary goal is to demonstrate the integration of real-time operating systems (FreeRTOS), graphical user interfaces (TouchGFX), and hardware peripheral control (GPIO, Timers, Interrupts) on the STM32F429I-DISCO development board.

The system features a 240x320 pixel color display, a dedicated audio engine for background music and sound effects using PWM, and physical button controls for game interaction. The software architecture is designed using the Model-View-Presenter (MVP) pattern provided by TouchGFX, ensuring a clean separation between game logic and visual rendering.

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