

Team 06: Automated Medication Dispense Unit

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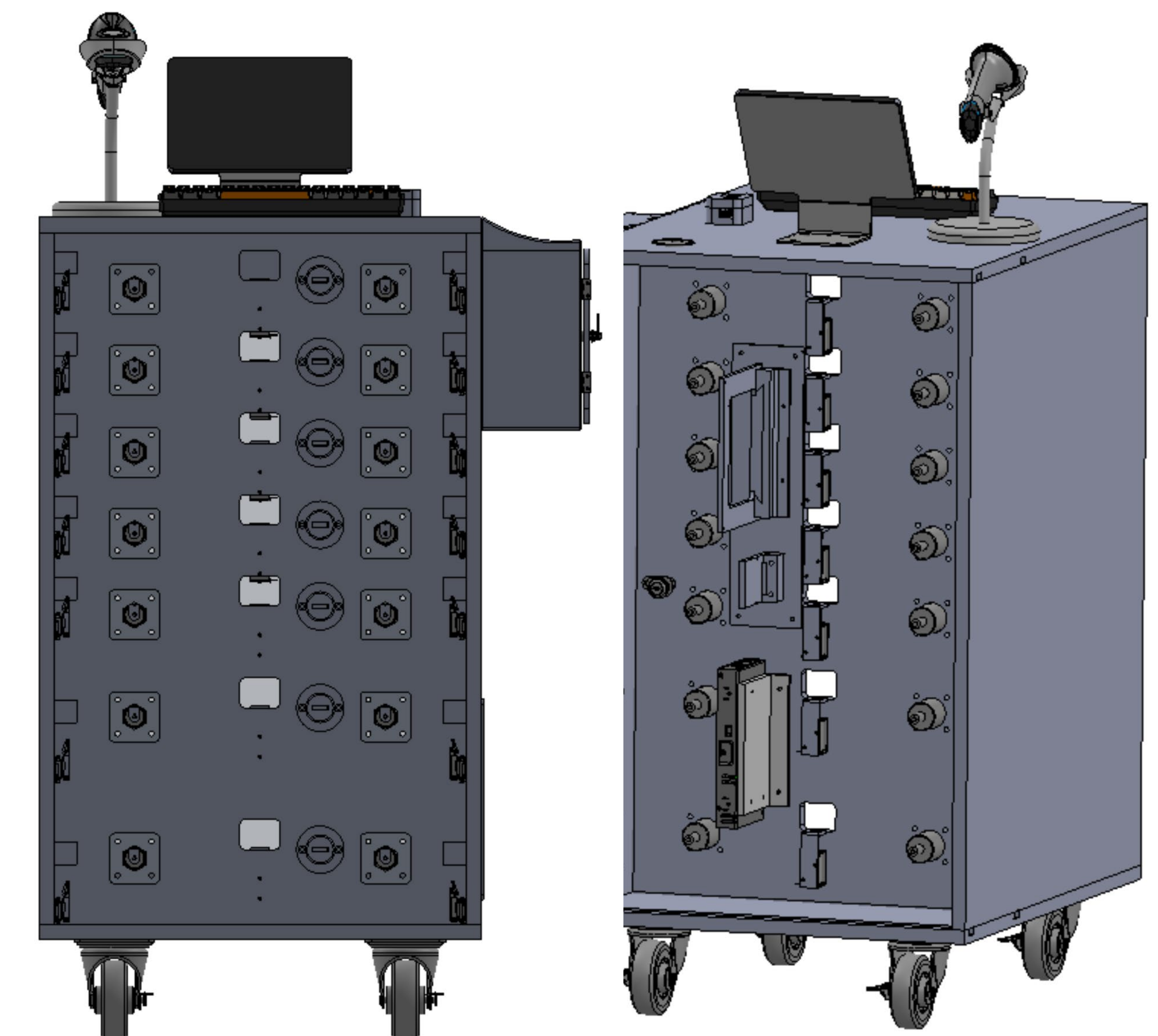
Purpose

Commercial automated medication dispensers provide realistic clinical training but are often too expensive for educational use. We designed a portable, lower-cost simulation unit that allows nursing students to practice secure medication retrieval, verification, inventory management, and waste procedures before entering clinical environments.



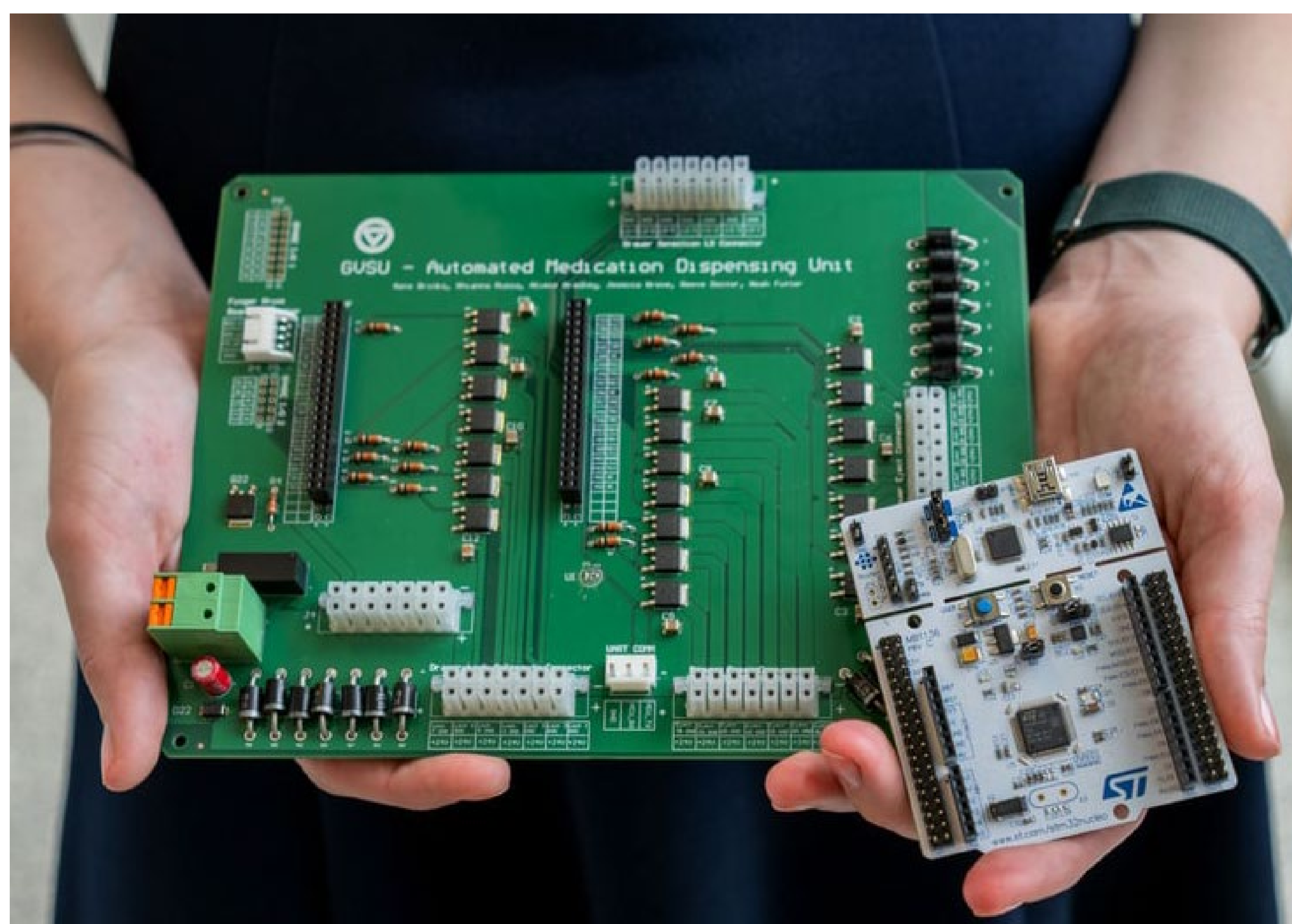
Design Highlights

The system combines a custom enclosure, seven electronically controlled drawers, custom circuit boards, embedded controls, barcode scanning, and a Python-based user interface. A Raspberry Pi manages the touchscreen, inventory database, transaction history, and barcode scanner, while an STM32 microcontroller controls the drawer locks, ejection solenoids, position sensors, and simulated fingerprint scanner. Locking casters allow the unit to be moved around the simulation center.



How it Works

Users sign in with credentials and simulated fingerprint verification, then select a patient and medication using the touchscreen. The drawer with the requested medication automatically unlocks and partially opens. After retrieving the medication, the user scans its barcode for verification. The system then records the transaction, updates inventory and confirms that the drawer has been closed.



Impact

This project gives GVSU nursing students hands-on experience with realistic medication workflows while providing faculty with a flexible, lower-cost training platform.