Trauma-induced coagulopathy (TIC) is a lethal condition that affects our blood’s normal clotting behavior. Given that 30% of TIC-related fatalities occur within the first hour, rapid detection and treatment is imperative to patient safety. However, current coagulopathy detectors are only available as large, stationary machines in hospitals and consume valuable time to deliver results.

**Overview / Design Specs**

TRAC is a portable, handheld trauma-induced coagulopathy detector intended for use in the field, capable of delivering results in under two minutes. This enables first responders to quickly and correctly treat their patients.

Features
- Intuitive touchscreen interface for ease of use
- Internal temperature control system that brings the blood chip to a target temperature for more accurate results
- Integrated rechargeable battery

**Hardware / Key Components**

STM32F469I Microcontroller
- ARM Cortex M4 (180MHz)
- Supports MIPI DSI interface for touchscreen compatibility
- Low power draw and fast boot times

Peltier Module
- When powered, one side heats up and one side cools down
- Used to control the temperature of the blood test chip to give accurate results

EmStat Pico
- Connects to electrodes on the blood test chip to perform the coagulopathy test
- Features a 30C discharge rate to maximize the heating/cooling rate of the Peltier module

High Discharge Rate LiPo Battery
- Features a 30C discharge rate to maximize the heating/cooling rate of the Peltier module

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**UI Workflow**
- Home Screen
  - "Start Test" Button
  - "Start Test" Prompt "Insert Chip"
- Results Screen
  - Test Results
  - Test Finished
- Testing Screen
  - Current Temperature Test Status
  - Chip Inserted

**Block Diagram**

Blood Chip
- Mux
- EmStat Pico
- Touchscreen Module
- UART
- MIPI DSI
- LCD Screen
- Battery Management System
- Battery

Temp Sensor
- Flash Memory
- Microcontroller
- H-Bridge
- Battery