Mathtech – 514

Wireless Hemodynamic Monitoring Wearable for Non-Invasive Hemorrhagic Shock Prediction

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A division of Mathtech, Inc.

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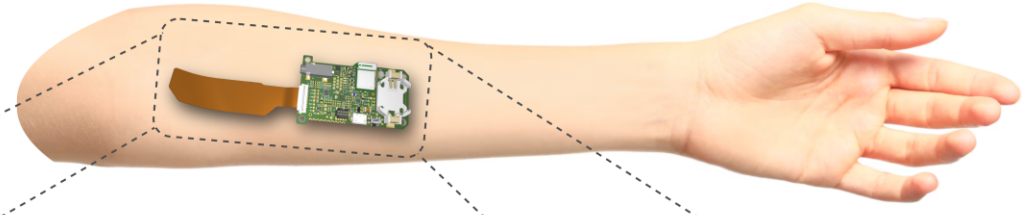
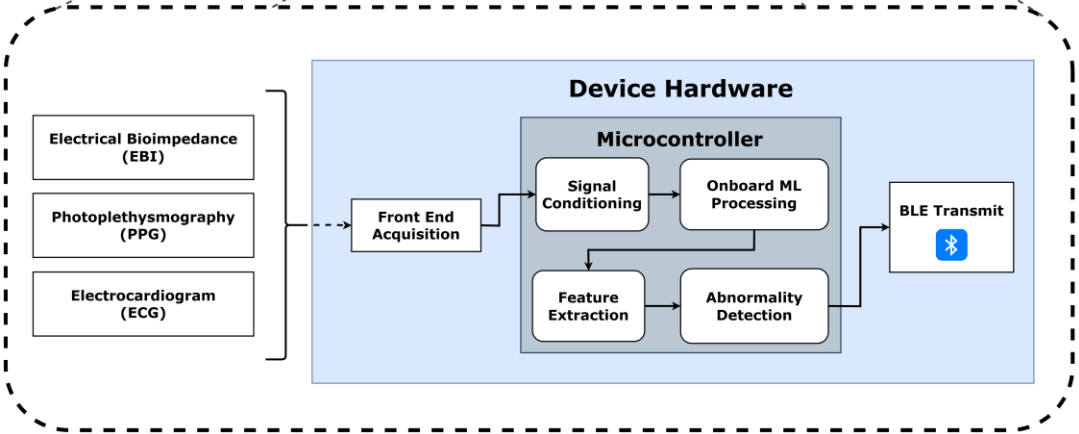
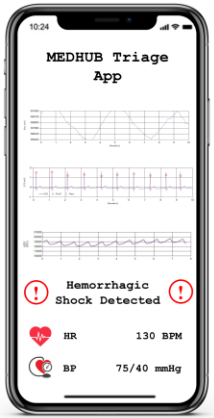
Hemorrhagic Shock Facts

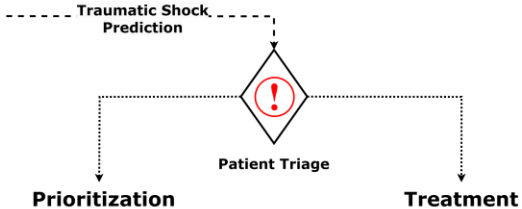
- Leading cause of death in the battlefield
  - Accounts for ~85% of preventable battlefield deaths
  - 1.5 million deaths/year (AAST, 2024)
- Hemorrhagic shock onset is unpredictable
  - Seemingly fine patients may deteriorate rapidly
- Typical standard of care involves ICU vital monitoring
  - Impractical in dynamic/battlefield settings

Main markers: Heart Rate, Systolic Blood Pressure, Blood Volume









Our Technology

Proactive Intervention	○ **Early detection** *before* hemorrhagic shock ○ Saving lives in battlefield settings
Advanced Monitoring	○ Continuous & non-invasive ○ Multi-modal, concurrent sensing
Triage Aid for Medics	○ **Identifies and prioritizes** critical patients in high-stress environments
Wearable, Cost-Effective Design	○ COTS-based, low-power, wireless, fully self-contained wearable ○ Suitable for in-field environment

The Only Wearable Device Purpose-Built for Hemorrhage Shock Prediction

	Electrocardiogram (ECG)	Pulse Oximetry (PPG)	Bioimpedance (EBI)	Fully Wearable	Hemorrhagic Shock Predicting?
Our Device	✓	✓	✓	✓	✓
Compensatory Reserve Index (USAISR)	✗	✓	✗	✗	✓
CoVa (Baxter)	✓	✓	✓	✓	✗

Market Opportunity & Strategy

- **Target Markets:**
  - Military and civilian trauma care sectors (dual use)
    - Field medics
    - Emergency response workers
  - Broader blood flow monitoring market
    - Dialysis, edema, HBP, etc.
- **Commercialization Strategy:**
  - Potential US Army partnership via existing MEDHUB communication system

Current Status & Milestones

- Concept → Prototype → **Proof-of-Concept** → Early Clinical Data

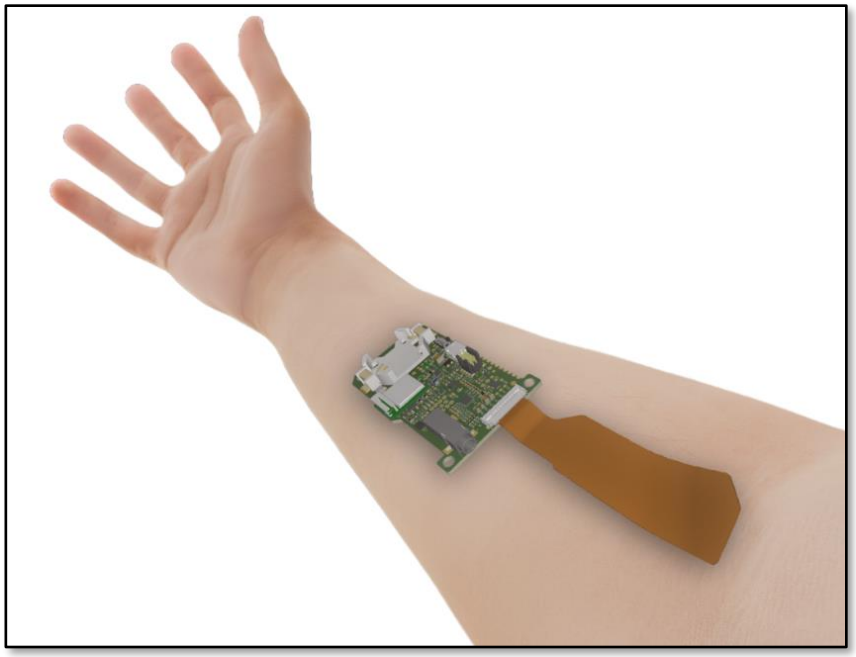
- Milestones:
  - Hardware prototyped – sensing modalities verified
  - Published seminal IEEE conference paper

IEEE Advancing Technology for Humanity

- Next steps:
  - Continue software algorithm development
  - Further hardware development

Funding Request & Closing

- **R&D Funding:** Support for further hardware refinement
- **Testing and Compliance:** Resources for patient testing, FDA approval expenses, and clinical trials
- **Manufacturing Readiness:** Funding to establish production capabilities for scalable, low-cost manufacturing



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