

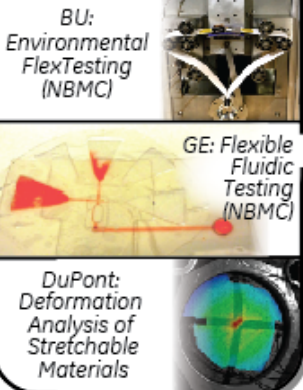
Topic 2.8: Assessment and Optimization of the Reliability of Wearable Performance Monitors

April 1, 2017 to March 31, 2019

Project Team



Prior Work



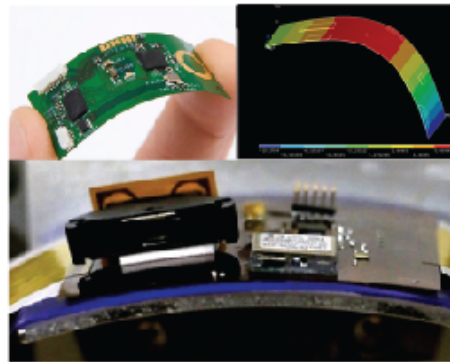
Assessment & Optimization of the Reliability of Wearable Performance Monitors

(24 months, \$3.1MM)

Objective: Develop infrastructure for testing and understanding the physics of failure for wearable human health/performance monitoring devices in a variety of use conditions

Technical Approach:

- Evaluate wearable monitoring devices by identifying operation ranges, corresponding stresses & conducting appropriate reliability testing
- Develop physics based failure models validated by experiments on WPMs & custom designed test vehicles
- Develop models and appropriate accelerated testing capabilities for life prediction



Technical Challenges:

- The wearable performance monitoring devices may not reflect realistic defects and/or process variations and baseline performance may remain unknown
- Accelerated tests may cause different damage mechanisms than in use, leading to incorrect life predictions
- Mechanistic models may not apply to the selected WPMs and input materials properties for the models may be lacking

Deliverables & Benefits:

- Fundamental understanding of the physics of failure in wearable performance monitoring devices under operationally relevant conditions
- Recommendations for design, manufacturing and quality assessment of next generation robust, high performing WPMs
- Centralized Reliability Labs with broad simulation and testing capabilities at Binghamton University, available to NextFlex Community for quality & reliability assessment of WPMs under military, athletic & clinical use conditions

