#### Project Title Wearable Real-time Injury Prevention System

#### Requester: Dr. Raoul Ouedraogo

#### Phone/Email: 339-223-0152

#### Company: MIT Lincoln Laboratory

#### Address: 244 Wood Street Lexington MA 02420

#### 

#### Date: 08-12-2019

### Please note that all RFP Forms must be completed by or before August 1 of a project cycle. If you have any questions regarding the RFP process for Senior Capstone Projects please contact the College of Engineering at 508-999-8539. Email inquires may be sent to rlaoulache@umassd.edu

**Title:**

# WRIPS: Wearable Real-time Injury Prevention System

**Description:**

<Enter a brief project description. What problem are you trying to solve? What are your project needs? Do **not** describe the solution.>

Prevention of resistance training related shoulder injuries will be the main focus of this project. The purpose of this project is to develop a wearable and wireless device that has a long-term goal of providing a user with haptic and visual real-time injury prevention, as well as user-friendly app-based analytics to provide helpful feedback that also aids in injury prevention.

**Diagrams (optional):**

*<Insert block diagrams, flow charts, assembly drawings, schematics, etc to better describe your needs.>*

**Scope:**

<Describe the scope of the project.>

The scope of this project is to create a prototype wearable monitor that collects shoulder movement/shoulder muscle activity data that pertains to resistance training focusing on the shoulder-related muscles. This data will need to be analyzed for a minimum of 1 or 2 resistance training exercises, and a method should be researched as to how this data can be used to prevent shoulder injuries in resistance training.

**Known constraints (if any):**

* Hardware (subject to change)

*<List hardware specifics. Note equipment to be used, etc.>*

Sensors (EMG,accelerometer,gyroscope),microcontroller

* Software (subject to change)

<List software specifics. Note required operating systems, programming languages, development tools, etc.>

C

* Interfaces (subject to change)

*<List interfaces to other hardware and software.>*

**Deliverables:**

<List reasonable expectations at the completion of the project. For example, design documentation, schematic diagrams, printed circuit layout, bill of materials, hardware, software, users manual, maintenance manual, etc.>

* Functioning wearable device with hardware
* Design documentation
* Research on data analytics

**Legal Information:**

Check below if this project involves:

IP Ownership by Sponsor (please contact rlaoulache@umassd.edu)

Non-Disclosure Agreement (please contact rlaoulache@umassd.edu)

**Project Classification:**

Select one of the classifications— Intradisciplinary1 or Interdisciplinary[[1]](#footnote-1):

Intradisciplinary (select a single discipline)

Bioengineering

Civil and Environmental Engineering

Computer and Information Science

Computer Engineering

Electrical Engineering

Mechanical Engineering

Physics

Interdisciplinary (select multiple disciplines)

Bioengineering

Civil and Environmental Engineering

Computer and Information Science

Computer Engineering

Electrical Engineering

Mechanical Engineering

Physics

**Special Instructions:**

<List specific instructions here.>

(To be completed in September by the team that undertakes the project)

Team Number: ­­­­\_\_\_\_\_\_\_\_

#### Student 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Project Manager)

Student 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Student 3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Student 4: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Student 5: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Faculty Advisor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Project Mentor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Intradisciplinary: working within a single discipline.

   Interdisciplinary: integrating knowledge and methods from different disciplines, using a real synthesis of approaches. [↑](#footnote-ref-1)