"The Faculty Mentor has initiated ongoing collaboration with UAH Athletics"

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**Faculty or Research Mentor**

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RCEU History: I mentored Noah Pring in the 2018 RCEU program

**Project Summary**

The faculty mentor has initiated ongoing collaboration with UAH athletics, primarily in IRB approved research studies involving the UAH Hockey team. Research studies this summer aim to continue building the foundation of collaborative work between the Department of Kinesiology and the Department of Athletics at UAH. The main focus of summer research efforts will be focused on the utilization of wearable sensors that utilize accelerometers and GPS technology to monitor player movements and physiological parameters during exercise and team competition. The system used will be the Polar Team Pro System (PTPS), which is a system of 20 heart rate monitors that are integrated with a central monitoring system on an iPad. The heart rate monitors communicate via blue tooth to the central system, and accelerometers built into the system have the abilities to track player velocity, speed, and accelerations. The addition of GPS technology allows for accurate tracking of distances covered.

The Department of Kinesiology has previously implemented PTPS in monitoring player load during training activities. Implementation of the PTPS at UAH, however, has been limited to hockey. Unfortunately, since hockey is an indoor sport, the inability to use GPS tracking for distances result in the system relying on algorithms programmed specifically for hockey that don’t appear to be as accurate as true tracking systems.

The aim of this RCEU project will be for the student and mentor to expand the use of PTPS at UAH to include outdoor sports such as lacrosse and soccer in order to examine physiological demands and movement patterns of players by comparing positions, skill levels, and across genders. Further, the system can be implemented to assess physiological stress related to coaching and officiating the sports. A separate study will be conducted to assess demands on players and officials in hockey, which will utilize the pre-programmed algorithms. This study will utilize the GPS capabilities with outdoor sports, allowing for a comparison of demands across sports as well as establish a means of comparing PTPS assessment abilities in indoor and outdoor sports.

**Student Prerequisites**

No course work prerequisites are needed, but the individual should be in either junior- or senior-level standing.

**Student Duties**

The student will be expected to work closely with the faculty mentor to perform the following duties in the conjunction with the Department of Kinesiology’s Human Performance Laboratory:
- Preparation of study documents, subject recruitment, and testing coordination
- Maintenance, calibration, and utilization of equipment
- Conducting familiarization and data collection sessions with the equipment
- Analysis of results related to the study

The student will be expected to work closely with the faculty mentor to perform the following duties across campus, particularly in the HPL, the UAH Strength and Conditioning Weight Room in Spragins Hall, and various sporting fields on campus:

- Measuring player metrics and work load utilizing PTPS
- Utilizing accelerometry and GPS data to analyze player movement patterns during the activity
- Coordinating future testing sessions with the research participants and coaching staff

The primary benefits to the students are:

- Hands-on learning with various laboratory techniques involved in human performance testing
- Opportunity to grasp the research process, from hypothesis generation to data collection, ultimately ending with a dissemination of findings
- Opportunity to contribute to a manuscript submission in a reputable journal or conference proceedings, depending on the progress of the study

**Mentor Supervision and Interaction**

The faculty mentor will provide the daily supervision to the student. In addition, the student is expected to update the mentor with a weekly progress report and during bi-weekly meetings. The following items are specific expectations related to faculty supervision and interaction:

- Weekly progress report
  o Written together with the student to monitor progress of the program
  o Discuss ongoing efforts related to the study and other research-related tasks, highlight any current issues, and establish plans for the following week
  o Evaluation: the faculty mentor will provide feedback for each report. The faculty mentor will assess and provide feedback on the writing, scientific progress, and quality of work.
- Bi-weekly progress update meetings with the student
  o Discuss current data, analysis of results, and actions to correct any issues that arise
  o Frequency of the meetings will be increased as needed throughout the summer
  o Evaluation: the faculty mentor will provide detailed instruction for the ongoing work and offer suggestions for improvement