Duke UNIVERSITY | BIOMEDICAL ENGINEERING

BME 590
Neurotrauma

Head Impact Instrumentation Project, Fall 2023

DUE: Wednesday, October 11, 2023 In-Class – [15% of Final Grade]

Project Overview: You and your partner have been selected to present at a conference on head impact exposure instrumentation systems. You have been given a 30 minute time slot to report on a single instrumentation system used to study head impact exposure, neurotrauma, or head injuries. Students should assume the audience is comprised of both subject matter experts and "intelligent lay-people." **Students will be expected to discuss a specific instrumentation system** in detail, as described below. Class participants should utilize resources such as Google Scholar, PubMed, and Web of Science to locate relevant academic peer-reviewed literature.

Assignment: In groups of 2, students will select an instrumentation system described, tested, and used in the literature. Each group will present a conference-style talk, fitting within a 30 minute time slot, allowing appropriate time for questions and answers. Your presentation should cover at minimum the following, in whatever order and organizational manner best conveys the information to your audience:

(1) What is the device?
   a. What sensors does it employ?
   b. How is the device used?
   c. Who is the intended end-user?
   d. What data does it gather, and what data does the end-user receive?
   e. How is the data intended to be processed/analyzed/interpreted?

(2) How was it tested/validated?
   a. Cite studies as relevant

(3) What studies have used this system in the literature? What have they found?
   a. How do these studies compare to the validation studies of the same device?

(4) What are the limitations of this system?

(5) What questions/areas of interest could this device help us address/study?
   a. Think about what we could learn about neurotrauma from this system, and how what we learn could be used to inform public policy.

(6) Any other information that would be relevant to fully understand the device, how it works, how it has been tested, how it has been used, etc.

Note that in keeping with general conference practices, your time slot is intended to encompass both your presentation and allow time for questions from the audience. When building and practicing your presentation, you should ensure that there is time for at least 2-4 questions from the audience. For context, for a 20 minute presentation slot, our lab typically plans for a roughly 15 minute presentation and 5 minutes of questions at the end. While not a strict rule, I would suggest aiming for a roughly 22-25 minute presentation.

You are encouraged to discuss your instrumentation selection with Dr. Luck or Mitchell to ensure you have identified an appropriate system for this project.