

# BME205 Practicum Reflection

## Part 1: Please suggest a grade for yourself, with comments

Holistic Grade; Check a box:

I Didn't do much	I Did a minimal amount	I did some	I did a lot	I did everything	I did yeoman's work
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Grade Value; Enter a number: 100

Explain how you arrived at this grade. (I don't need an essay but some succinct, high quality personal reflection is welcome).

I am choosing this grade because I accomplished all the tasks outlined in the practicums (in less time as well since I lost my first Practicum time slot due to unforeseen circumstances), as well as learned a lot about sensors and using them to measure different signals in the body. I always worked with the highest quality I could and I completed the write ups in a timely manner, while processing and visualizing the collected data in a communicative way. Having finished the practicum content, I was able to better communicate with a friend of mine who was having some health tests conducted. Since I understood what the different sensors did and could measure, I was better able to understand their situation and help be a good friend and listener. Because of all of these factors I believe I deserve this one hundred grade.

## Part 2: Your name: Joaquin

What is the key question you would like to answer here?

**How can this technology be used to help the most people, especially those in need?**

Ask the question, and answer it (or if you don't know the answer yet, how will you approach it?):

**I don't know how to answer this question. But I suspect I would need to do a lot of research and find problems that could benefit from the use of these technologies in scanning biology. This process is similar to Praxis I and II.**

## Part 3: Looking at specifics

Model of investigation:

- Choose 3 of your favorite or best or most fabulous questions and type them in here. Why did you choose these?
- Choose 3 of the artifacts that you created in the practicum and paste them in. Why did you choose them?

Questions:

1. What was the maximum heart rate you reached with your Valsalva maneuver?

**I record this question since it was fun to do the maneuver.**

2. What differences did you notice in the response with increased stoop test difficulty?

**I really enjoyed doing the test even if it was stressful.**

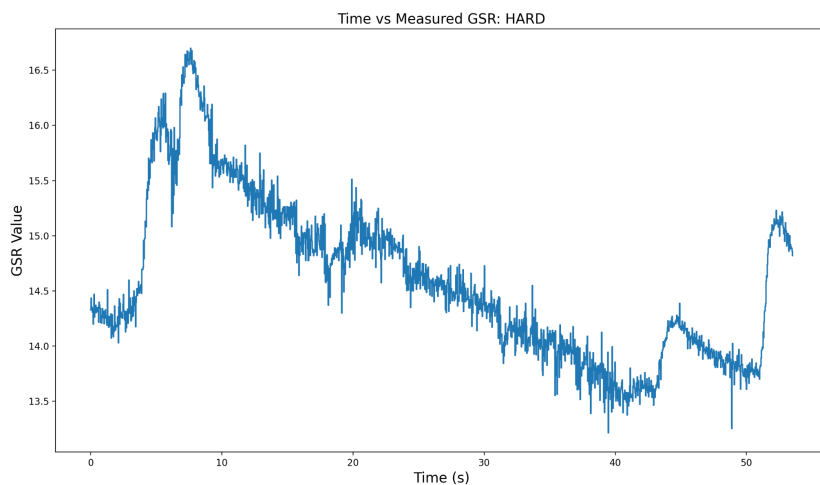
3. What was your heart rate immediately after exercise

**Watching my lab partner after he had done the exercise was memorable.**

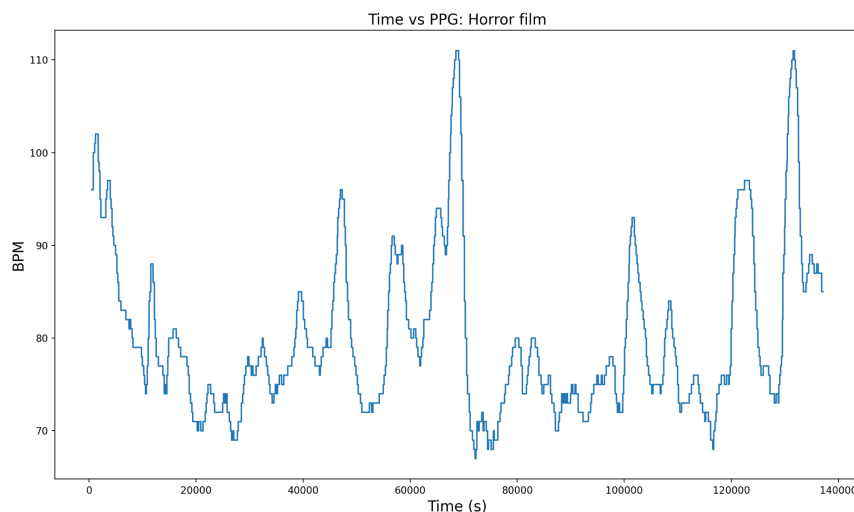
### Artifacts:



**Coding the program that did this was a lot of fun**



**Doing this activity was fun**



**I loved making up this lab**

## Part 4: General reflections

### What do you know now that you did not know in January?

At the most basic level, I now have a better idea of how biosensors work and what information they can read from the body. When I go to the doctor's office or a medical office, I will understand or at least be able to guess what the technical machines are measuring and how they are performing those measurements. While this not helpful in the short term because I am not pursuing a career in this field, from a general knowledge perspective, it is good information to know.

### What work was challenging? What was fun? What was useful? What didn't seem useful?

The work that seemed the most challenging was anything to do with the Arduino. While interesting in concept, the amount of technical issues that occurred was extremely frustrating, especially since it seemed that no one knew what to do. Without more prior experience using the device in that way, it was arduous to try to collect any data from it thus it felt like the least useful device and path in the lab.

However the bio-radio was extremely fun and useful. Since it was easy to use, collecting data using it didn't feel like a chore and allowed for more time spent in analyzing the data and results, rather than troubleshooting the collection process. If I were to get a bio-radio for myself, I'd be able to conduct most if not all the experiments in the labs as well as any creative and personal experiments I'd like to conduct.

### Did you learn anything unexpected?

I learned that heart rate and breathing are more connected than I thought. I always thought that breathing and heart rate, while connected obviously since the heart is pushing oxygen to the rest of the body, were still very separate processes and could exist without the other (if something went really wrong). However during Practicum 2 I learned that you could manipulate your heart rhythm by changing your breathing. Although there are no good applications of this information its still interesting to know.

### Did you expect to learn something that you didn't learn?

I had hoped to be able to learn about measuring brain activity but in the end I chose not to pursue this in Lab 3 since it was not a sensor I had learned already and I was pressed for time, having less practicum time than I should've. If given another opportunity, that is the information I would like to learn more about.

### Did you develop some new questions?

Similar to above, I have more questions about brain activity and what it can be affected by. If given another opportunity I want to see how much different types of music can affect our brain activity and whether or not there is an 'optimal' style of music for certain tasks.

Did you change your mind about anything?

Not really. I was open to this process and was interested in exploring new topics, ones that I had never explored before. If I was given more time, I think I would've had an excellent time exploring all these different topics.

If you were going to write a physiology myth—something people generally believe about their body, but which is false—what would it be? And why?

In your own words, what do “quantified self” or “bioinstrumentation” mean to you?

I think that these words refer to whether or not we associate our identities with our bodies, or whether or not we believe that bodies are just physical vessels that contain us. If we do not fully understand our body, can it really be a part of us? I don't consider a car a part of my identity, even when I'm driving. Could our bodies be the same way?

What is our quantified self? Are we merely bioinstrumentation? In my answer to these questions, I think about how my body is more than just a part of me. For others it is the only part of me they can perceive since they can't see my thoughts, my emotions etc. These more inner feelings are represented on my body but to others the body and all its reactions and interactions, *are me*. So to me my body is a part of my quantified self. I am more than just bioinstrumentation.

What do you wonder about? What soul-burning question(s) do you currently have? What questions would you like to investigate? When? How?

As a religious person, I believe in God. My question is how God uses the specifics of science to create and/or control the universe. The more I learn about how physics works, and how our mere existence is dictated by very insane statistical coincidences the more I realize that based on science there has to be some sort of higher power that is controlling these probabilities. Just because statistically it was inevitable that life would be born, doesn't make it anymore of a miracle. So I wonder how God is involved in the science I am learning in this program.

What's one random fact you learned this semester? Where did you learn it?

I learned how a computer processor worked which was a magical moment. For most of my life I had known how the basic circuits of and and or gates worked through minecraft, and then the larger processes like OS but I didn't know how the two were related until this year.

What's a profound insight you've gained?

We only understand a little bit of the universe.

## Part 5: Some feedback

- Did you ever talk about the practicums outside class? Often / occasionally / **rarely**.
- Were there any memorable readings? **Not really**.
- Did you follow a suggested model or forge your own path? **Mostly followed the suggestions but also made some modification for time's sake**.
- Did you become curious about anything new? **Sometimes, but I felt restricted and unable to explore it**.

- e) Did this class connect with any other courses? **It connected a lot to physics since physics dealt with molecules and how they interact with biology.**
- f) What was your initial reaction to the lack of focus on a grade? How do you feel about it now? **Because I'm a perfectionist, it didn't change anything.**
- g) Did you make a new friend? **No. Since our tutorial sections have been the same all year, by this point I got to know everyone in my section outside of this class.**
- h) What do you think you'll remember in 5 years? **I'll remember the positives and (hopefully) none of the negatives.**
- i) Have you thought about the ways you learn? Have you observed anything that you might take forward with you? **This program lets you see a lot of different things but doesn't give you the opportunity to explore them. You have to choose and explore them on your own.**

## Part 6: Numbers

- a) Approximately how many hours did you spend reading about material related to the practicum on your off weeks? **1 Hour**
- b) In terms of participation in the practicum activities, how engaged and mentally present were you in the labs? (Some potential options: there and ready to go all the time; sometimes engaged and sometimes texting or surfing or doing work for other classes; pretty remote) **I was always ready and engaged. Trying to finish all the tasks as soon as I could.**
- c) Approximately how much of the protocols did you read?
  - ☐ 90–100%
  - ☒ **75–89%**
  - ☐ 50–74%
  - ☐ less than 50%
- d) Do you have any comments about \_\_\_\_? **None**

## Part 7: Give yourself a check for each activity completed

- ☒ ☒ ~~Electrodermal Activity/Galvanic Skin Response~~
- ☒ ☒ ~~Photoplethysmography~~
- ☒ ☒ ~~Electromyography (dry electrodes)~~
- ☒ ☒ ~~Electromyography (wet electrodes)~~
- ☒ ☒ ~~Electrocardiogram~~
- ☐ ☐ Other type of sensor available in the Design Studio; list: \_\_\_\_\_
- ☐ ☐ Other type of sensor you used with approval of TA; list: \_\_\_\_\_
- ☒ ☒ ~~Bioradio~~
- ☒ ☒ ~~Arduino (with difficulty)~~
- ☐ ☐ I used the Matlab scripts provided
- ☐ ☐ I made modifications to the Matlab scripts provided
- ☐ ☐ I created new Matlab code
- ☐ ☐ I used Matlab Simulink
- ☒ ☒ ~~I used the Python scripts provided~~
- ☒ ☒ ~~I made modifications to the Python scripts provided~~
- ☒ ☒ ~~I created new Python code~~
- ☒ ☒ ~~Followed protocols~~
- ☒ ☒ ~~Modified protocols~~

- ☒ ☐ ~~Created an entire new protocol~~
- ☒ ☐ ~~I used the design model of exploration~~
- ☒ ☐ ~~I used the learning cycle model of exploration~~
- ☒ ☐ ~~I used the scientific inquiry model of exploration~~
- ☐ ☐ I used my own model of exploration, and I call it: \_\_\_\_\_

## Part 8: Do you have any other comments?

Have a wonderful summer break! Keep in touch!