

# Coding a Neuroscience Database

**Sophie Greer, Spring 2021, Praxis**

**What Was My Course?**

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# My Praxis Course

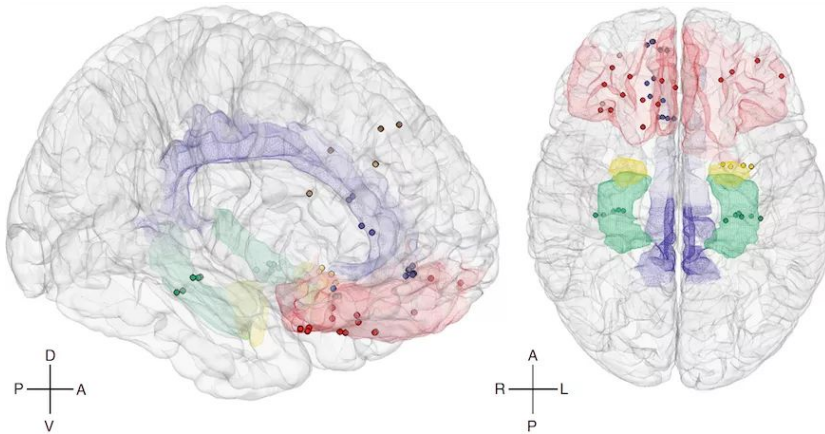
- Spring 2021 semester (Feb. 22 – May 14; almost 3 months)
- Van Hooser Lab, Brandeis University (Waltham, MA), but done remotely from my dorm
- Course title: “Coding a Neuroscience Database”
- Field: computational neuroscience
- Up to 10 hours/week
- Faculty advisor: Professor Rebecca Compton (Haverford)
- Involved using code to help the lab create the Neuroscience Data Interface, a platform (combination database & interface) that researchers can use to analyze, store, and exchange neuroscience, physiological, and imaging data
- I used MATLAB, a computer science language often used for data analysis

# **What is Computational Neuroscience?**

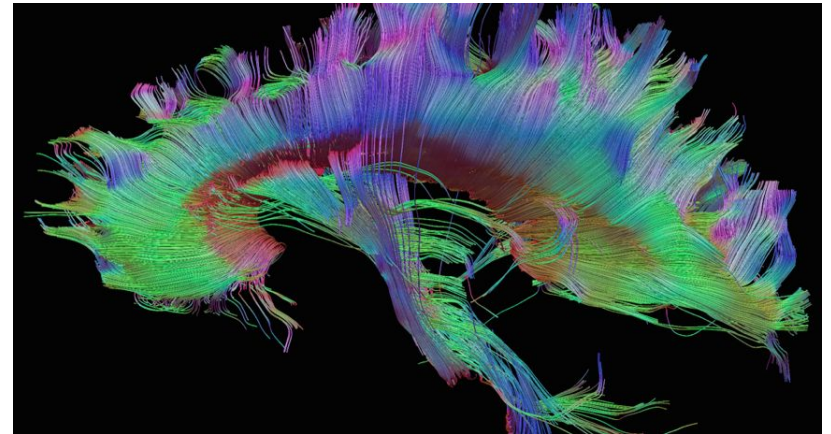
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# What is Computational Neuroscience?

- Combination of computer science and neuroscience
- Involves things like artificial intelligence (AI), analyzing brain scans using code, and in my case, coding a platform that can take in and process scientific data, including data from neuroscience studies



3D visualization of the brain with some regions highlighted. From <https://www.emotiv.com/glossary/computational-neuroscience/>



Diffusion Tensor Imaging (DTI) scan. From <https://www.fens.org/>

# **The Framework for My Course**

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## Course Description

“This Praxis Independent Study course would explore the basics of computational neuroscience. Through this course, the student will learn about how to facilitate the replication of research studies, collaboration between labs, and storage and analysis of data by helping code the Neuroscience Data Interface, a new database that will help labs store, analyze, and exchange neuroscientific data. The student will learn how to model neurological and neuropsychological concepts with math and computer science, and will learn more about programming languages commonly used in computational neuroscience. The course will involve programming languages such as MATLAB and Python and will hopefully culminate with the student getting their name on a research paper.”

# Learning Objectives

1. Over the course of a semester, learn how to collect and analyze neurological/neuropsychological data in the form of raw data, graphs, charts, and tables in a lab environment
2. Over the course of a semester, learn how to model neurological/neuropsychological concepts with Python and MATLAB
3. Over the course of a semester, learn how researchers within and between scientific labs work together to replicate studies and exchange data, and how to support them in doing this by helping to develop a database



# **My Journey to This Course**

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# My Relevant Academic Background

- I have loved neuroscience with a passion since middle school
- My interest in computer science came about later
- I took some brief coding classes online in high school but the field did not grab me until I took Computer Science I in the Fall of 2020
- I learned of the field of computational neuroscience in the fall of 2020 when I read about it in a scientific article assigned for class. I instantly fell in love and felt I had to know more about the field

# How I Found This Internship

- In searching for Praxis internships and internships for this summer, I attended a virtual career fair held by the Society for Neuroscience in early November 2020
- I made many connections through this fair, including one with Brandeis
- I emailed them my resume and participated in an informal interview
- I have had a lot of research experience prior to this semester so recruiters liked me
- I also found institutions via Google

# My Advice for People Interested in a Praxis Independent Study

- I highly recommend going to a career fair if you're looking for job opportunities, internships, etc
- Have your resume ready to give to people when you go
- Make sure to get recruiters' contact information before you leave
- Within a day or two after the fair, email recruiters and remind them who you are and what you're looking for and send your resume (again, as the case may be)
- With luck, you might get an interview
- Some fields are more competitive than others so you may need to contact many, many places before getting a call back
  - In total, I emailed 50 - 75 institutions; 15 emailed me back (computational neuroscience is very competitive)
  - I got offers from 5 places, and accepted the one from Brandeis!

**Why Brandeis?**  
**Why the Van Hooser Lab?**

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# Why Brandeis? Why the Van Hooser Lab?

- I looked at Brandeis when I was applying to college so I have known they are strong in STEM for a long time
- I had wanted to contribute to research in neuroscience, preferably computational neuroscience, ever since I first learned of the field in one of my classes in Fall of 2020 (right before I applied to the Praxis program)
- The Van Hooser Lab seemed to be doing the most interesting work out of all the labs I interviewed at that fall

**What's Next?**

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## Summer 2021

- I will continue interning for the Van Hooser lab this summer, and now they'll pay me!
- I will intern for 20 - 35 hours/week, instead of the Spring's 10 hours/week
- I will continue working on the lab's Neuroscience Data Interface using MATLAB, and will begin work in Python (another computer science language) as well