

**SUMMER 2020 – SC EPSCOR / INBRE RET PROJECT DESCRIPTION FORM**

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<b>Research Subject Area</b>	Computational Biology/Neuroscience and Biomedical Physics

**A. Briefly describe overall research program at your laboratory.**

*My research lab develops computational models of biological systems with specific emphasis on neural networks. We closely work with experimentalists from the Medical University of South Carolina (MUSC) and Utah State University (USU) to answer biologically-relevant research questions.*

**B. Briefly describe specific project(s) for your teacher:**

***Optogenetic modulation of cerebral activity.*** *We work with MUSC to better understand the basis of theta rhythm activity. The research project focuses on designing a data-driven model for the prefrontal cortex. Our goal is to generate new testable hypothesis regarding the effect of optical stimulation of neurons on neural activity.*

***Time perception.*** *We collaborate with USU to model behavioral and electrophysiological data that could lead to a better understanding of the neuroanatomical structures involved in time perception. We developed a computational model that captures a significant portion of experimental observations. We are interested in further exploring the hippocampus structures involved in memory storage.*

***Lab equipment.*** *The lab also has a wide range of devices for monitoring and recording neural activity. We have one research-grade set of EEG/ECG amplifiers with 32 electrodes for behavioral experiments. We also have an EMOTIV EPOC+ 14 channel mobile EEG for brain-computer interface. The lab has multiple eye tracking devices and a research-grade near infrared functional imaging unit.*

**C. Will any other people (post docs, grad students, undergraduate students, colleagues, etc.) be involved directly with your teacher?**

*The teacher would work with me and possibly an undergraduate student.*

**D. Will you require any advanced reading/preparation for the teacher? If yes, please briefly describe.**

*Yes, I will assign appropriate reading materials for the respective project. Working with the equipment requires an in-depth study of the user manual. For computational projects we will cover some basic programming.*