



SHP Student Interns for Research and Scholarly Activities Project Proposal Form

Instructions:

Please fill each box to the right of the required fields, obtain the required signature and return via email to Michele Sisco (mcoral@shp.rutgers.edu) by **March 24, 2026**.

If you are sending attachments, please ensure your contact information is added to all your forms.

Please note if you are a Non-Resident Alien to see the tax withholdings:
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Faculty Contact Information:

Date submitted:	March 27, 2026
Faculty Name:	Soha Saleh
Department/Program:	Rehabilitation and Movement Sciences
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Project Detail:

Project Title: (56 characters max)

Real-time EEG-controlled Brain Stimulation for Movement Rehabilitation

Hypothesis:

closed-loop EEG guided brain stimulation approach increases neural engagement and improves within-session performance compared with sham

Description:

(Include design, methodology, data collection, techniques, data analysis to be employed, evaluation and interpretation methodology for research component)

Stroke survivors often have persistent upper-extremity motor impairment and cognitive fluctuations that limit their ability to engage in the high-dose, task-specific practice needed for meaningful recovery. Exergame-based rehabilitation offers an accessible, engaging platform for intensive, multi-joint training, but outcomes remain highly variable, partly because of inconsistent cognitive engagement and lack of real-time personalization. Transcranial alternating current stimulation (tACS) can modulate neural oscillations involved in motor and cognitive function, yet current protocols use fixed stimulation parameters and have been tested only in simple tasks, limiting clinical relevance. Thus, it remains unclear whether personalized, closed-loop tACS can enhance neural engagement and motor performance during complex, functional upper-extremity training. The goal of the project is to test a closed loop personalized tACS system guided by real time EEG recording (DuaITask tACS) in a single blinded study design. We will extract individualized oscillatory features and cortical targets from baseline EEG during exergame play, then apply reinforcement learning to modulate tACS in real time based on neural markers of cognitive motor engagement. In a single session within participant comparison, we will quantify feasibility, usability, neural engagement, and motor performance relative to sham. Hypothesis: EEG tACS will be feasible and will enhance task relevant neural activation and motor performance compared with sham.

Specific Student Responsibilities:

The student will support the experiments to validate the EEG-tACS system. They will support data collection, and analysis of EEG and behavioral data.

Start / end date of project: June-August 2026

2/12/2026

WHAT OTHER EDUCATIONAL OPPORTUNITIES ARE AVAILABLE TO STUDENTS? (e.g., journal club, seminars, clinic, rounds)	Student will participant in lab meetings and journal clubs.
WHERE DO YOU PLAN TO PRESENT OR PUBLISH THE FINDINGS WITH THE STUDENT? (e.g., national or state meetings, newsletter or journal, SHP poster day)	The project will be presented at SHP annual student symposium and in Society of Neuroscience meeting.

CHECK ALL APPROPRIATE BOXES BELOW AND PROVIDE REQUESTED INFORMATION.

This project is: clinical laboratory behavioral survey educational
 Other: please specify _____

This project involves the use of human subjects (including chart review, retrospective studies and questionnaires).

Pending Approved IRB Protocol Number _____

IRB approval must be obtained by June 2025

Are you an Employee at RU? Yes No

Are you a Non-resident Alien? Yes No

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 Signature of Department Chair

3/27.2026

 Date