

**SHP Student Interns for Research and Scholarly Activities
Application of Project Proposal Form**

Instructions:

Please fill out the form and return via email to Michele Sisco (mcoral@shp.rutgers.edu) by **March 25, 2024**. Please fill each box to the right of each required field. If you are sending attachments, please ensure your contact information is added to all your forms.

Faculty Contact Information:

Date submitted:	3/25/2024
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Project Detail:

Project Title: (56 characters max)	Design computer-based gamified multidisciplinary treatment for children with cerebral palsy (CP) to improve their speech intelligibility and upper extremity function.
Hypothesis:	Gamified therapy will provide fun and engaging activities that will increase the children’s adherence to treatment. Combining speech and upper extremity motor treatment will allow for interdisciplinary skill transfer, which may result in more enduring benefits and the retention of acquired abilities.
Description: (Include design, methodology, data collection, techniques, data analysis to be employed, evaluation and interpretation methodology for research component)	We propose to have two half time interns; one from either the OT or PT program and one from the SLP program. The interns will collaborate with the team to integrate gamified upper extremity therapy with gamified speech intelligibility therapy. The speech games will utilize the Speech Intelligent Treatment (SIT) methodology. The interns will work with an engineer and speech and physical therapists to create three computer-based games that combine speech and hand elements, designed to be operable through voice, hand/arm movements, or a combination of both. The accuracy and movement range of the upper extremity tasks will be matched to the level of mouth opening and the intensity of voice projection. Game 1. Speech component: Word intelligibility. UE component: Precision of whole hand opening. Game 2. Speech component: Sentence intelligibility. UE component: Finger individuation.

	<p>Game 3. Speech component: Conversational intelligibility. UE component: Reaching range of motion.</p> <p>Game design includes 3 aspects:</p> <ul style="list-style-type: none"> • Game Concept • Gameplay Mechanics • Level and World Design
Specific Student Responsibilities:	<ol style="list-style-type: none"> 1. Perform a thorough review of the latest studies on gamified speech therapy and upper extremity therapy for children with CP, highlighting the advantages and disadvantages of each approach. 2. Determine the five most frequently utilized gamified activities in speech therapy to improve intelligibility, and the five most frequently used gamified upper extremity/hand activities to improve upper arm/hand function. 3. Outline five distinct methods utilized for assessing speech intelligibility and upper extremity function for children with CP in a clinical setting (five for each type of function). 4. Utilize the insights gained from tasks 1 to 3 to devise three preliminary game designs that are applicable for speech therapy, upper extremity rehabilitation, and a combination of both. 5. Create the narrative, setting, characters, and lore that will enrich the game world and engage players. 6. Rules and Objectives: Establish how the game is played, what the goals are, and what rules players must follow. 7. Player Interaction: Design how the player will interact with the game world, including controls and user interface. 8. Create engaging levels, maps, and environments that are fun to explore. 9. Create a comprehensive Game Design Document (GDD) that outlines games' concept, mechanics, story. This document serves as the blueprint for games and a presentation tool. 10. List five types of feedback therapists use during Speech Intelligibility Treatment (SIT) to facilitate improvement. 11. Utilize insights gathered from tasks 1 through 4, devise three preliminary game designs suitable for speech therapy, upper extremity therapy, and combined therapy.
Start / end date of project:	Approximately 6/24/2024 – 8/16/2024

Educational:

<p>WHAT OTHER EDUCATIONAL OPPORTUNITIES ARE AVAILABLE TO STUDENTS? (e.g., journal club, seminars, clinic, rounds)</p>	<p>Students will be given the chance to collaborate in a lab focused on creating technology-assisted rehabilitation systems. They will acquire hands-on experience by working alongside engineers, speech therapists, and physical therapists to design rehabilitation activities with a gamification approach, utilizing VR/AR technologies.</p>
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<p>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)</p>	<p>Based on the Game Design Document (GDD), three playable prototypes will be developed. The functionality and user experience of these prototypes will undergo evaluation. The concepts behind the game design and its usability will be showcased during the SHP Poster Day.</p>
	<p>These prototypes will be advanced into three computer-based, gamified, multidisciplinary therapeutic interventions. A research study will be carried out to assess both the feasibility and the efficacy of these interventions for speech and upper extremity rehabilitation, as well as to investigate the brain responses associated with both domains following the therapy. Insights gained from the feasibility study will inform future grant applications and academic publications.</p>

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 2024

 PT, DPT, PhD.

March 26, 2024

Signature of Department Chair

Date

OR-For internal use

Form: (1)

Reviewed date: _____

Date processed on website: _____