Dr. Alex,

As we have discussed earlier, I am writing to formally ask if I can continue my research under you during the Spring 2024 semester for my Senior Project. I am also writing on behalf of two of my peers, Ian Kreger and Michael Wong, to request whether they can join the research team; as I have explained, we were planning on doing a project together, but one of our teammates was ultimately unable to commit to working with us. I can vouch for Ian's and Michael's skills, and I believe they would be valuable additions to the current team. I will personally handle familiarizing them with the tools we use (e.g., Unity).

To briefly reiterate/outline the project for the purposes of your communication with Dr. Thomas, we would be working on an application of Tangible Usable Interfaces in Montessori learning environments. Montessori education emphasizes learning through experience and hands-on exploration, such as through the use of alphabet blocks. Children can arrange the letters however they want to in order to form short words, which can then be explained or described to the children. Montessori education also minimizes the use of technology, only encouraging it when interactions are meaningful or there are no alternatives.

Our research attempts to update the alphabet block learning experience with modern technology—using Tangible User Interfaces, we turn the blocks themselves into the input mechanism and present output on a screen that is integrated into the learning space. This minimizes the technological feel of the experience so that it agrees with Montessori education principles. The software would recognize a word that a child forms and return an associated image as well as other information, such as a definition

or a related sound (e.g., a bark sound if the child forms the word “dog”). If the child forms a word that is not real, but is similar to a real word or combines two real words, the system would be able to react dynamically and present an imaginary concept (e.g., if a child combines “cat” and “dog,” the system could show half an image of each stitched together). This latter ability of the system justifies the interactions as meaningful beyond a simple “high-tech upgrade” to an existing approach. If this is deemed too narrow or small in scope as-is, a potential extension of this idea involves recreation of the concept in Virtual Reality.

As this is a research project, the goal is to actually be able to collect data before or by the end of the semester—at minimum, we want a working prototype. Broad milestones for this research are having functional hardware, having software that can recognize letters in a given arrangement, and software that can find an image to present to the user based on the word input.

I’m glad to be able to continue working with you in my final semester at UF! Please let me know if you and Dr. Thomas require any more details or other information.

Best,
Tony Gupta