Online learning which is provided by a computer interface was first introduced as a supplement to traditional classroom-based learning. It has changed from a supplemental to a low cost alternative approach to education. Online learning has been growing over the past decade and it is becoming a strong competitor for classroom-based education. As the online learning programs are becoming more popular, there are essential elements that are still missing in general online learning platforms. Online students can manage their learning schedules much easier and more productive based on their personal constraints (job, family, etc.). They can participate in the learning process no matter how far they are from the campus. They can join in online discussions, post their assignments, and take their exams at their time convenience. However, online learning as a viable alternative needs to reach a new level by addressing its shortcomings in comparison with classroom-based learning. The main advantage of a classroom-based learning over online learning is professor-student engagement in the classroom environment. Interactive textbooks and online lectures cannot exclusively provide personal help that students need. Online asynchronous communication with an invisible professor and faceless classmates lacks the professor-student and student-student engagements that are promoted in a classroom setting. For example, students in a classroom can ask their questions to get clarification in the moment by raising hands rather than having to ask their questions by sending emails and waiting for a reply.

1. The objectives of the proposed project are:
   
   I. To provide proof of concept by setting up a virtual reality platform (hardware and
software) to practice online learning in a virtual classroom.

II. To design student and professor avatars in the virtual classroom designed in (I).

III. To maintain the advantages of online learning while providing professor-student and student-student engagement by attending in a virtual classroom in the proposed platform.

IV. Investigating the required resources to promote Florida Tech’s online learning to a new high level through this proof of concept experiment.

V. Student engagement in research and teaching. Students are the core of this project to help setting up the platform, programming of the simulator, testing and providing feedback based on their expectations of a virtual online class.

2. This project is not part of my current research (which is focused on image and signal processing, computer vision, and statistical analysis). However, it intersects with my interests in research and teaching.

3. Information technology plays a significant role in the proposed work. To set up the platform, to assign the online resources for the simulations, and to assess Florida Tech’s online learning program requirements in the proposed virtual reality platform.

4. This minigrant will help to purchase the equipment to set up a minimum platform that will be used to provide the proof of concept for an NSF grant “Cyberlearning and Future Learning Technologies (Cyberlearning) - Exploration Projects (EXPs)” that I plan to submit


Budget

**Software:** Quest3D from $1900.00 (*Virtual Realities Ltd.: http://www.vrealities.com/*)

**Hardware and Accessories (Virtual Realities Ltd.: http://www.vrealities.com/*)**

- **Head Mounted Display** – Virtual Viewer 3D: from $599.00,
- **Head Tracker** – Virtual Cube: from $449.00,
- **Internal motion tracker** – Virtual Cube: from $449.00,
- **3D Controller** – Space traveler from $199.00,
- **Data Glove** – Peregrine: ~ $144.00

**Student Stipend:** $1260.00