



BUILDING UP A VIRTUAL/CYBER- PHYSICAL STEM LAB

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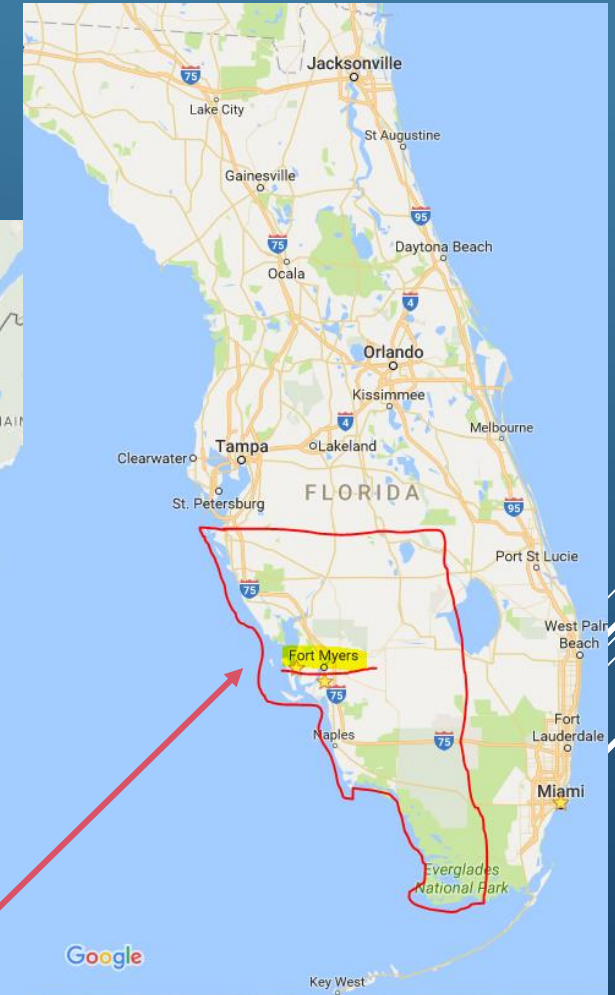
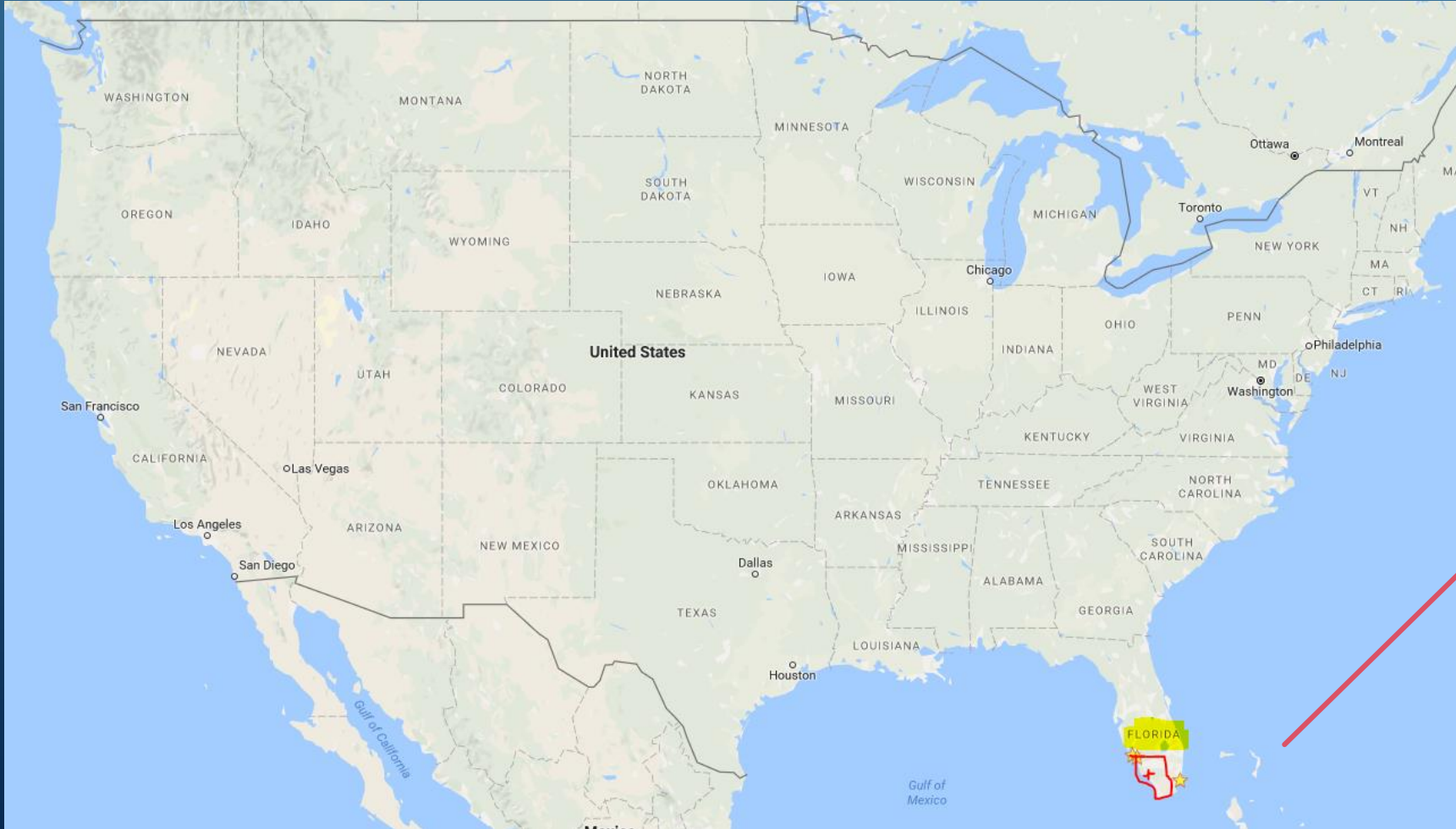


PROJECT BACKGROUND 1

- ▶ Florida Gulf Coast University (FGCU) is a very young university (1997-2017). It is the only comprehensive state university in southwest Florida, and includes:
 - ▶ College of Arts and Sciences
 - ▶ College of Education
 - ▶ College of Health Professions and Social Work
 - ▶ Lutgert College of Business
 - ▶ The UA Whitaker College of Engineering

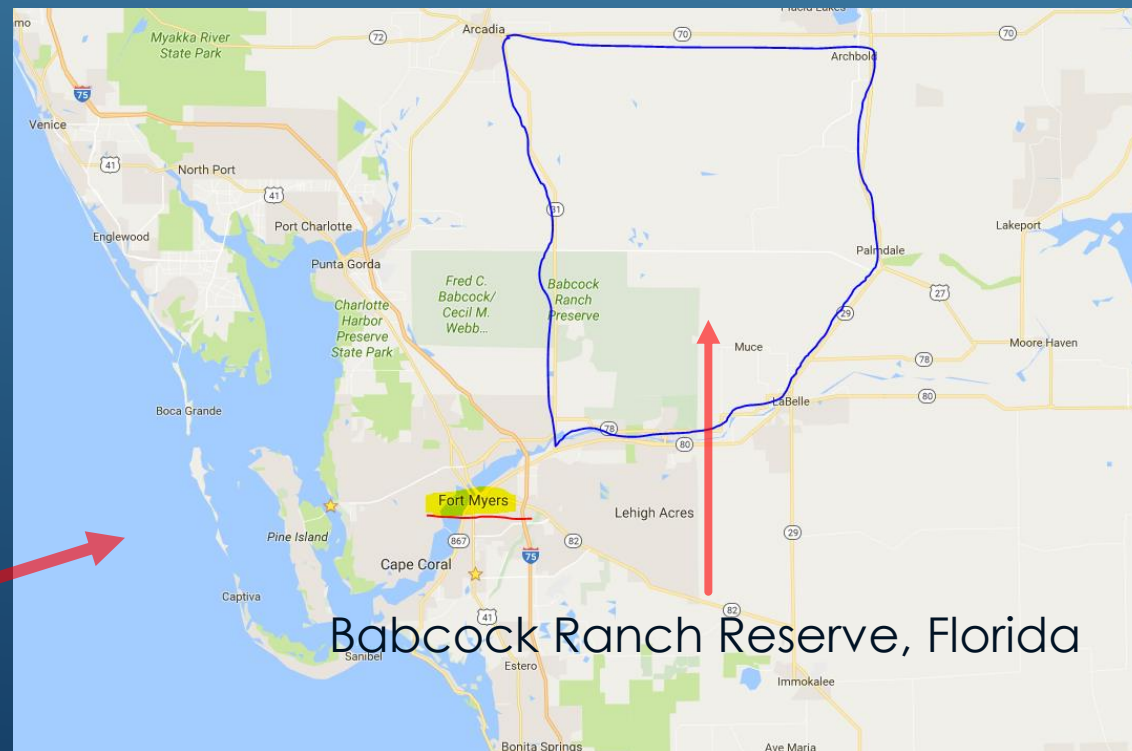
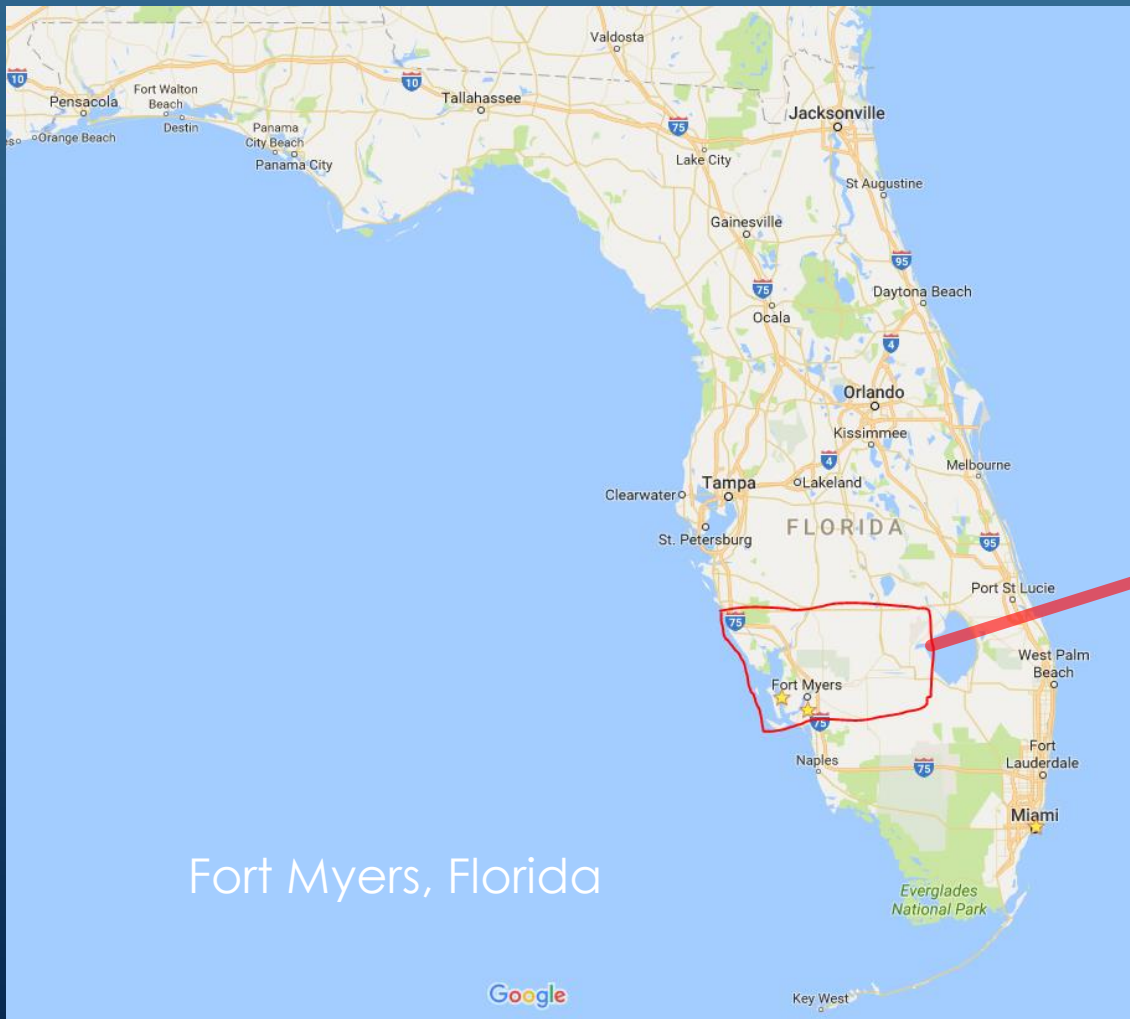


Location of FGCU in southwest Florida





City of Fort Myers and Babcock Ranch Reserve in southwest Florida





PROJECT BACKGROUND 2

- ▶ The Babcock Ranch Charter School is a new school being built on a large ranch in north Fort Myers, Florida. The ranch construction developer and the new school board are working with Florida Gulf Coast University to build their school and its curriculum. In addition, this new school and Florida Gulf Coast University are also working to establish a new Experiential Learning Center of Tomorrow.
- ▶ The Experiential Learning Center of Tomorrow will explore new technologies for learning and instruction with focuses on (1) Virtual Lab and Tele-Presence, (2) Integration of Wearable Technologies, (3) Internet of Things, and (4) Digital Immortality.
- ▶ Our research project is related to the first focus of Virtual Lab and Tele-Presence.



PROJECT OBJECTIVES

- ▶ Explore the design of a framework for a mobile dashboard that will support cyber-physical robotics along with other distance-based manipulatives (such as 3D printing) to facilitate individualized experiential learning.
- ▶ Promote the pedagogical framework of comprehensive 'engineer-think' STEM curriculum.
- ▶ Guide the development of an adaptive, assessment-based and fully functional user mobile-first dashboard learning engine that will make STEM content more meaningful and relevant to individual learners.
- ▶ Integrate a proven English language learning curriculum with STEM-related content for Chinese students who are studying English as a Foreign Language.



PROJECT STATUS

- ▶ This project was approved by Advanced Innovation Center for Future Education (AICFE) on December 14, 2016, right after our fall semester ended last year. This is the first week of our Spring semester 2017. There has been no progress made between then and now.
- ▶ The research team will review and revise the project timeline to fit the schedule suggested by AICFE. The original timeline is to be shared on the next slide.



PROJECT TIMELINE

| Tentative Time | Tasks to Be Completed |
|----------------|---|
| 1/15/2017 | Participate in the Second Seminar for Future School 2030 |
| 3/15/2017 | Systematic data, literature and documents review, and the completion of research design |
| 5/25/2017 | Attend the 3rd seminar for Future School 2030 |
| 6/1/2017 | Design the Lab and write and submit a report |
| 9/30/2017 | Design and develop two sections of online manipulative instructional materials for using a mobile dashboard to access the cyber-physical lab, and two sections of online robotics instructional materials for using a mobile dashboard to access the cyber-physical lab |
| 2/1/2018 | Testing and refining those instructional materials |
| 5/1/2018 | Pilot Testing completed and paper submission |
| 12/1/2018 | Submission of the Project Report and closing the project |



PROJECT SCOPE

- ▶ While we have been able to successfully design mobile apps to access various remote robotics applications, what is needed is a comprehensive, generic user-friendly dashboard that supports multiple input formats for different robotic devices.
- ▶ Our project will investigate the feasibility of setting up a remote dashboard that functions as an access platform for students to manipulate remote robotics applications for learning purposes from a distance.
- ▶ Our project will also pilot test with students to discover the learning effects of using the Virtual Lab.



PROJECT SIGNIFICANCE

- ▶ The students in remote areas have the same needs to explore hands-on activities and manipulatives as others who have immediate first person access to robotics labs.
- ▶ This Project will provide opportunities for experiential learning for students via a remotely accessed virtual lab.
- ▶ This Project will provide documents for designing and developing a virtual learning lab with experiential learning resources and remotely controlled manipulatives.



CONTACT INFORMATION

- ▶ If you have any questions about this project, please feel free to contact Dr. Charles Xiaoxue Wang at xxwang@fgcu.edu

Thank You Very Much!