

Project Summary

Overview:

Project Elements:

- New REU Site.
- *Project Title:* REU Site: Secure, Accessible, and Sustainable Transportation.
- *Principal Investigator:* Dr. Sandip Ray.
- *Submitting Organization:* University of Florida
- *Other Organizations Involved in the Project's Operation:* University of the Virgin Islands; Norfolk State University, and Prairie View A&M University.
- *Location at Which the Proposed Undergraduate Research Will Occur:* Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL 32611.
- *Main Field and Sub-Fields of the Research:* Transportation systems, Security, Accessible Transportation, Sustainable Transportation.
- *No. of Undergraduate Participants Per Year:* 10.
- REU Site Type: Summer.
- *No. of Weeks Per Year that the Students will Participate:* 10 weeks.
- *Does the Project Include an International Component or an RET Component?:* No.
- *Name, Phone Number, and E-mail Address of Point-of-Contact for Student Applicants:* Dr. Sandip Ray, (352) 392-1605, sandip@ece.ufl.edu;
- *REU Web Site:* To be Developed.

Transportation systems have seen a rapid transformation in recent years, with infusion of autonomous features driven by the integration of sensors, actuators, compute elements, communication protocols, and software. The intellectual focus of the REU site is to explore and comprehend the needs and trade-offs between security, sustainability, and accessibility as we move towards autonomous transportation. The educational focus is to transform undergraduate students into independent researchers by training them to think independently and challenging them with real-world research questions. The proposed REU site is to involve a diverse cohort of students in research and curricula focused on autonomous transportation. REU participants will (1) explore research problems, (2) gain important research skills via hands-on projects, and workshops, and (3) disseminate research through oral and written communications. A specific target of student population will be HBCUs and universities with limited research opportunities.

Intellectual Merit: REU participants will investigate cutting-edge cross-disciplinary research problems in autonomous transportation systems. The research problems examined will include (i) cybersecurity challenges to autonomous transportation, (ii) impact of autonomy on persons with disabilities, and (iii) techniques to exploit autonomy for sustainability. Aside of addressing critical problems in transportation, the research will help participants comprehend the role of connectivity and computing to address problems of global impact. Participants will obtain unique exposure to a variety of state-of-the-art technologies, platforms, and tools. Furthermore, the site will include systematic training and events for the participants to hone their problem-solving skills and learn to be independent researchers

Broader Impacts: The project will provide socio-economically disadvantaged students unique exposure to STEM research and education in general and research in emergent critical infrastructures in particular. Furthermore, these participants will improve their oral and written communication skills through regular presentations and written project reports and foster their problem-solving and independent thinking. The research experience provided by the REU Site will fill in crucial knowledge gaps in emergent transportation area and enable the growth of a diverse workforce. Another important outcome will be the awareness of students in the cross-collaborative research opportunities provided by the transportation sector and the impact of connected systems and Internet-of-Things. The project results will be broadly disseminated both through publications as well as other online venues.