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Undergraduate Research Program

Project Name	Localization and Tracking
Campus & Location in Mexico	Monterrey
Faculty	Engineering and Sciences
Research Area	Telecommunications and Signal Processing
Research Responsible	Cesar Vargas Rosales
Description of the Project	In many complex environments such as in vehicular networks, smart cities, forests, campus-wide, retailing, etc. localization is important in order to addressed problems and to prevent situations that might compromise the environment and human lives. Wireless reconfigurable networks such as sensors and ad-hoc networks, help us to create a framework where localization can be conducted to determine points of interest that could trigger situations that might be dangerous, such as forest fires, failures in power plants, tracking of vehicles in smart cities, tracking of people anonymously, etc. In this project, you will need to design algorithms that allow us to determine localization and positioning of devices based on signals transmitted by them. Different ideas for self-localization that are used by drones and robots, and system-based localization will be incorporated in the algorithms. The project also has a characterization phase through the use of simulators to determine statistical behavior of parameters of interest and variables in order to develop statistical models that would help us understand the dynamics of scenarios.
Training Provided	Definition of localization problem, use of Matlab for simulations, writing of scientific documents.

Offered during:

SUMMER	X	WINTER		SEMESTER	X

Student

Tasks/Responsibilities	To design an algorithm based on ideas provided during the semester. To simulate and characterize statistically the phenomenon. To write a document which will be a draft of a future paper where the student will be a co-author.
Required Language Proficiency	Reading, writing and speaking fluently English is required
Required Skills and Abilities	Programming, basic concepts of algorithms and statistics.
Other Documents	1) Being at least in your 2nd year of bachelor 2) Accumulative grade point average (GPA) 2.5 3) Official Transcript 4) 2 letters of recommendation of faculty members 5) Resume 6) Letter of intention explaining the reason why you would like to participate in the research program