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### Undergraduate Research Program

<b>Project Name</b>	The Science of Statistical Processing of Data.
<b>Campus &amp; Location in Mexico</b>	Monterrey
<b>Faculty</b>	Engineering and Sciences
<b>Research Area</b>	Communications and Signal Processing
<b>Research Responsible</b>	Cesar Vargas Rosales
<b>Description of the Project</b>	<p>Statistical data processing has been developed based on the ideas of adaptation, dynamics and prediction. Its applications are vast because you can see those in bioinformatics, neuroscience, audio, music, video, data analytics, bioengineering, DNA sequencing, telecommunications, computer networks, health monitoring, cybersecurity, among many others.</p> <p>The main objective of the project is to develop frameworks consisting of algorithms of the statistical nature that can help to classify, predict, extract patterns and add intelligence to many different environments and applications such as those needed in the localization of relevant events through the use of sensors, the modeling of the dynamics of COVID-19 for prediction, the development of smart algorithms for pattern search and recognition, the determination of genomic processing techniques for DNA-like sequencing, the definition of new strategies in 6G-like environments for attack detection, mitigation and cancellation in reconfigurable networks, the opportune detection of events such as epilepsy among others, the determination of smart algorithms for millimeter wave systems in 5G and vehicular scenarios, and the growth of all these smart techniques towards the quantum environment. We invite you to be part of the future through the development of innovative ideas to improve our daily lives by contributing with solutions to current and future problems.</p>
<b>Training Provided</b>	Training provided will be in statistical and smart techniques to process large quantities of data, the use of software such as Matlab, the exposure to mathematical techniques used and developed in the group, the writing of technical documents with a future vision of a journal paper.

### Offered during:

SUMMER

☒

WINTER

☐

SEMESTER

☒

### Student

<b>Tasks/Responsibilities</b>	<p>The research is focused on the generation of smart algorithms based on statistical tools, estimation and prediction techniques for different applications. The main responsibilities will be</p> <ol style="list-style-type: none"> <li>1) To analyze statistically data and develop algorithms that can help make predictions in order to prevent damaging events such as cyber attacks, epilepsy seizures, communication failures, etc.</li> <li>2) To program algorithms and present results with different statistical tools that help to visualize pattern behaviors in order to extract information</li> <li>3) To write and organize all the information generated in formal documents that can be improved towards future publications in journal</li> </ol>
<b>Required Language Proficiency</b>	English, it is the preferred language with good skills in reading, writing and speaking
<b>Required Skills and Abilities</b>	Basic programming (Matlab is a plus, but not necessary), basic probability and statistics, algebra and matrices.
<b>Other Documents</b>	<ol style="list-style-type: none"> <li>1) Being at least in your 2nd year of bachelor</li> <li>2) Accumulative grade point average (GPA) 2.5</li> <li>3) Official Transcript</li> <li>4) 2 letters of recommendation of faculty members</li> <li>5) Resume</li> <li>6) Letter of intention explaining the reason why you would like to participate in the research program</li> </ol>