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|  | **Systems Engineering Program** | |
| **Subject** | Intelligent Systems |
| **Professor** | Fran Ernesto Romero |
| **Activity** | Workshop 1: Parkinson Telemonitoring |

1. **Goals**

* Strengthen student knowledge in descriptive statistics
* Strengthen the knowledge acquired in machine learning techniques and algorithms.
* Generate skills in the use of modeling and programming tools for machine learning.

1. **Problem statement**

Consider the problem stated in:

<https://archive.ics.uci.edu/ml/datasets/Parkinsons+Telemonitoring>

*2.1. Data Exploration*

* Load dataset
* Describe each variable (maximum, minimum, average, standard deviation, distribution). Do you understand each statistical measure?
* For each variable, plot its distribution
* For each variable, plot its distribution respect to class variables ('motor\_UPDRS' and 'total\_UPDRS')
* Generate the correlation matrix and plot it as heat map.
  1. *Feature Selection*
* Remove unnecessary attributes
* Remove low variance attributes
* What are the attributes that are most related to the class variable ('motor\_UPDRS' and 'total\_UPDRS')? Support your response using at least 2 attribute selection methods.
  1. *Regression*.

Use a Regression technique to predict 'motor\_UPDRS' and 'total\_UPDRS'. Evaluate the results.

* 1. *Develop an Intelligent System*

You need to develop a portable artifact that automatically identifies a probable Parkinson's patient using the model developed above. You can use Arduino, Raspberry, ESP32, Odroid, NVIDIA Jetson or similar.

1. **General Conditions**

* Maximum 2 students per group
* You can use the tool of your choice. Recommended: Python
* A written evaluation will be carried out to validate the development of the exercise