Human Activity Recognition  
CS582 - MACHINE LEARNING  
PROJECT PROPOSAL - Group 4

## Data set

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|  | The data set for this project was taken from UCI machine learning repository. It was built from the recordings of 30 study participants performing activities of daily living (ADL) where each person performed six activities wearing a smartphone (Samsung Galaxy S II) on the waist:  WALKING, WALKING\_UPSTAIRS, WALKING\_DOWNSTAIRS, SITTING, STANDING and LAYING.  Using its embedded accelerometer and gyroscope, 3-axial linear acceleration and 3-axial angular velocity were captured at a constant rate of 50Hz. |

## Project idea

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|  | The project idea is to use different machine learning algorithms to classify activities into one of the six activities performed. Then, compare the accuracy between these algorithms. |

## Software to write

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|  | **Machine learning algorithms:**   * Logistic Regression * Keras Neural Network * Random Forest * SGD * SVM * K Nearest Neighbors   **Programming language:** Python |

## Papers to read

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|  | 1. Davide Anguita, Alessandro Ghio, Luca Oneto, Xavier Parra and Jorge L. Reyes-Ortiz. Human Activity Recognition on Smartphones using a Multiclass Hardware-Friendly Support Vector Machine. International Workshop of Ambient Assisted Living (IWAAL 2012). Vitoria-Gasteiz, Spain. Dec 2012 2. Ruder, Sebastian. “An overview of gradient descent optimization algorithms.” CoRR abs/1609.04747 (2016). 3. Ho, Tin Kam (1995). Random Decision Forests (PDF). Proceedings of the 3rd International Conference on Document Analysis and Recognition, Montreal, QC, 14–16 August 1995. pp. 278–282. Archived from the original (PDF) on 17 April 2016. Retrieved 5 June 2016 |

## Team

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## Deliverables

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|  | * Machine learning algorithms implementation * Algorithms accuracy comparison * Graphical representation of data and results * A paper describing team work (due to: Saturday of 4th week) |