## ECE 532 Course Project Update 1

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# Human Activity Recognition with Smartphones Sensors

https://github.com/HungTran114/ECE532\_Course-Project

**1. Project Progress**:

Dataset: “Human Activity Recognition Using Smartphones” from UCI Repository, 10929 rows of data with 563 attributes, multiclass classification into 6 different activities performed (walking, walking upstairs, walking downstairs, sitting, standing, laying)

Because this is multiclass classification, I added 6 binary variables to classify in a one-vs-rest scenario.

My first algorithm is linear regression. So, my plan is to build 6 different models and then choose the predicting the label for which the corresponding classifier reports the highest confidence score.

I tried least square and ridge regression for my model. As I was getting very high singular value, I think regularization is necessary. I will try LASSO after regularization, and maybe some cross validation to see which value of lambda work best.

However, I am getting really high error rate, which makes me think that linear regression may not be the best way for this problem.

My current Jupyter NB file links is:

https://github.com/HungTran114/ECE532\_Course-Project/blob/main/Final%20Project%20-%20Update%201.ipynb

I changed my plan for the project as I have not fully understood SVM and multiclass classification. I think my algorithms will now be linear regression, SVM, and neural networks.

Going ahead, my plan will be:

- Understand how to classify multiclass problems

- How to use SVM (in the activity, we use sklearn, so probably I will find out more from that package)

- Ready for Neural network.

**3. Project timeline (revised):**

|  |  |  |
| --- | --- | --- |
| **Semester week** | **Date** | **Tasks** |
| 8 | 10/22 | Topic proposal |
| 11 |  |  |
| 12 | 11/17 | Project Update 1 - Linear regression |
| 13 |  | Linear regression |
| 14 | 12/1 | Project Update 2 – SVM |
| 15 |  | Neural networks - initiated |
| 16 |  | Final Reports due |