



# ActivPal internal presentation #8

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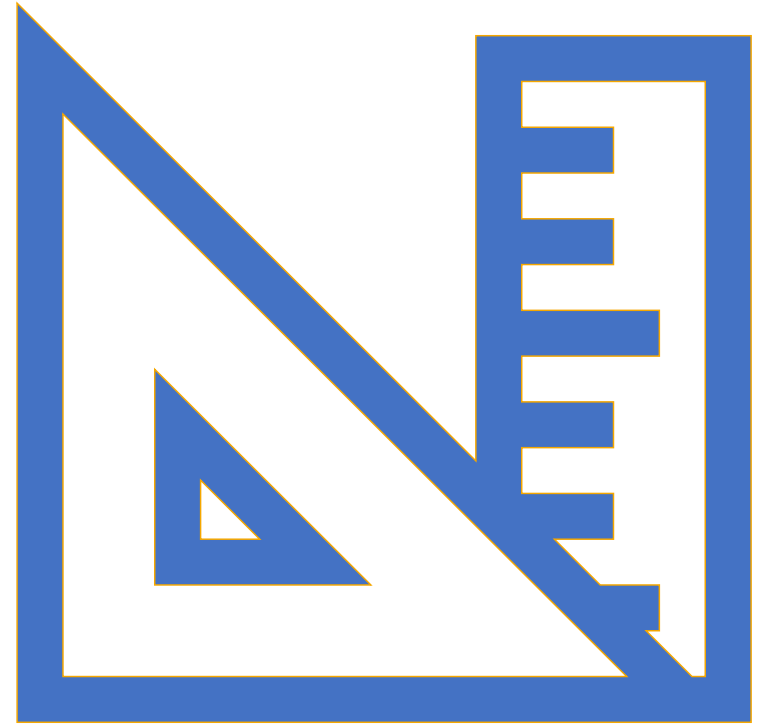
Colin Werkhoven



# Topics

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- Introduction
- MET Prediction Model
- Activity recognition
- Data analyses
- Questions





# Introduction

- Current models
- Issues
- Group member



## MET Prediction Model Research

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- To get nonbiased results we looked for multiple models that predict the MET value
- Random Forest Model
- K-nearest Neighbour Model
- XGBoost Model

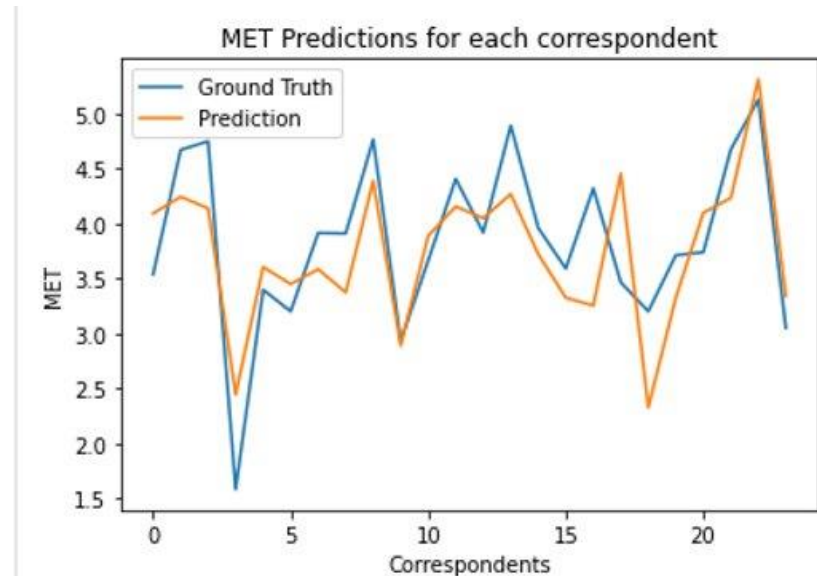
# First MET Prediction Model

## Features in our current Random Forest Model

- Sum of magnitude of acceleration
- Body Mass Index (BMI)
- Age Category (ranging from 15-79)
- Is the Person Sporting (is\_sporting)
- Does the person meet the balance guidelines (meets\_balance\_guidelines)

pal_time	sum_mag_acc	bmi	age_category	is_sporting	meets_balance_guidelines
2019-10-11 13:52:00	1551.296652	21.911357	7.0	1.0	0.0
2019-09-26 13:10:00	1409.222602	19.773854	2.0	1.0	1.0
2019-10-02 14:39:00	1412.507255	36.148088	12.0	1.0	0.0
2019-10-11 10:19:00	1480.956743	20.189072	1.0	0.0	0.0
2019-09-30 11:40:00	1434.234623	22.041522	1.0	0.0	0.0

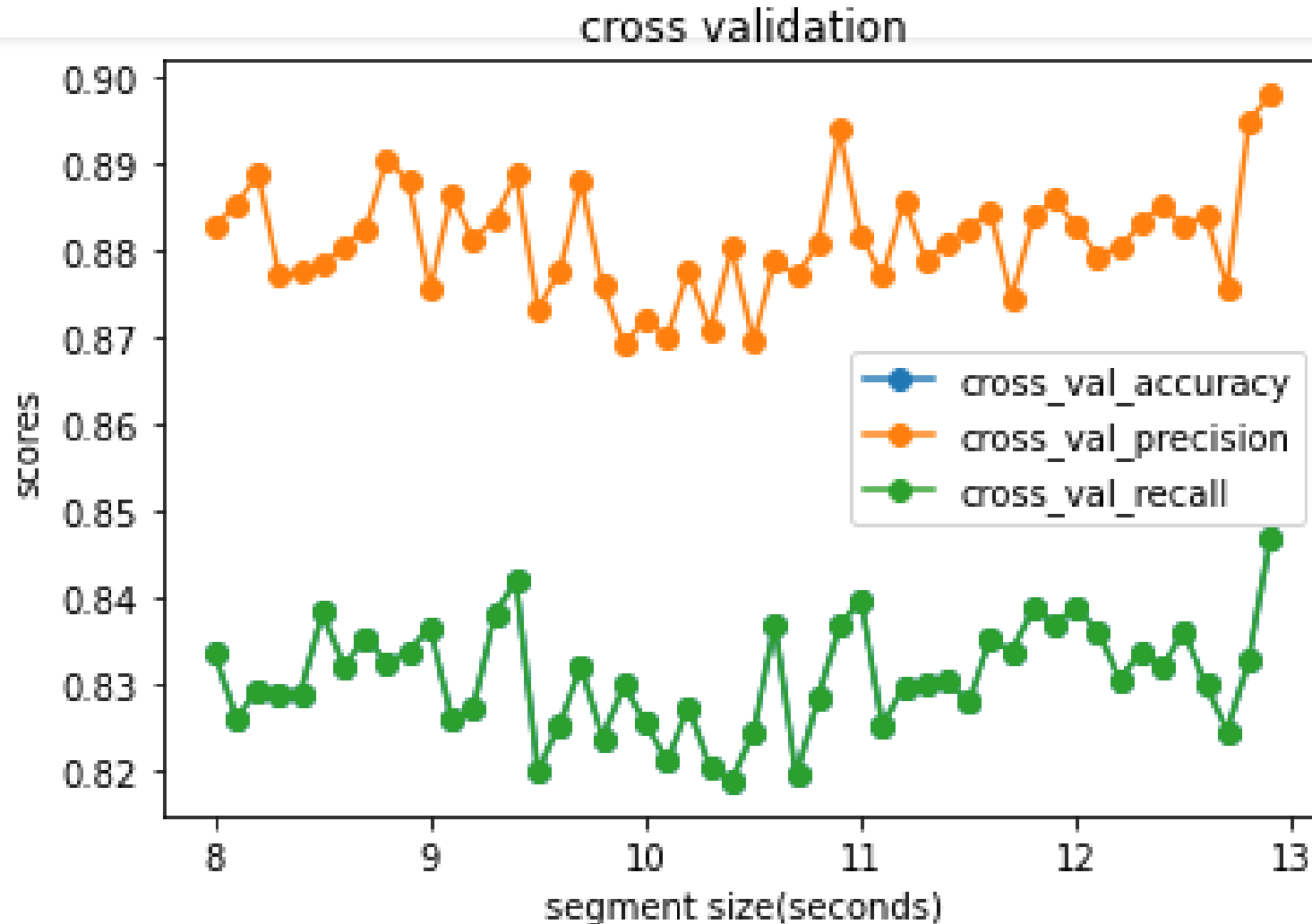
## Random Forest current results



```
score = randomForest.score(X_test, y_test)  
score
```

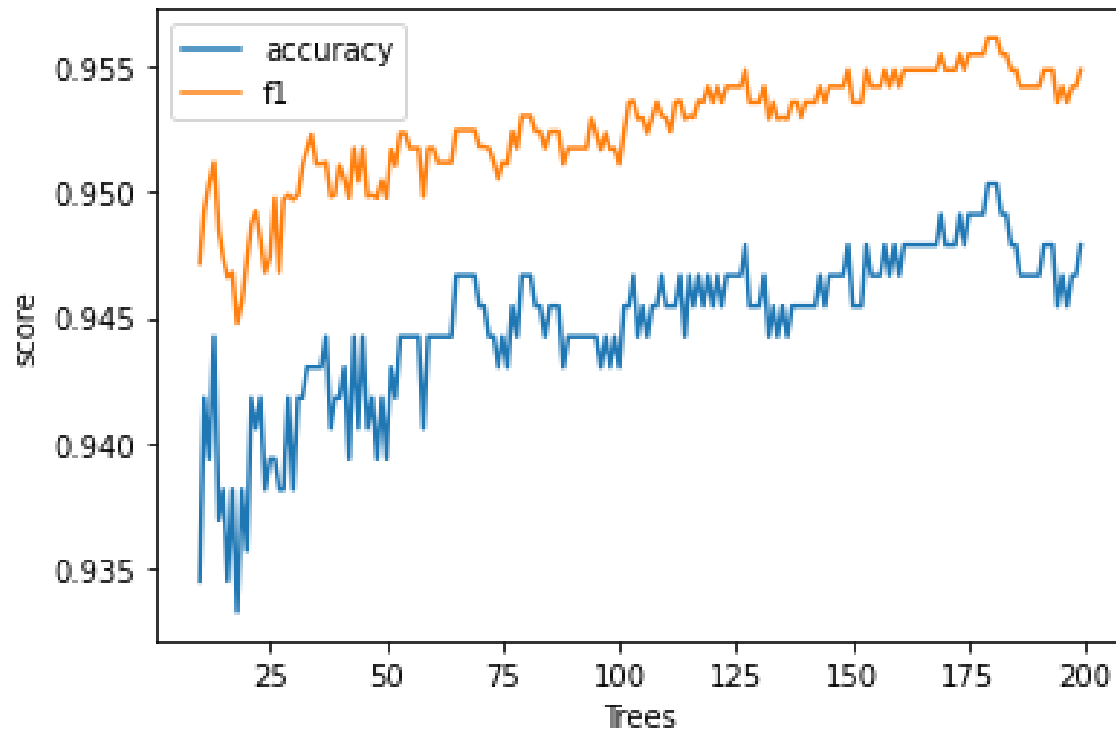
0.5552479060498544

# Activity recognition optimization: Time segment

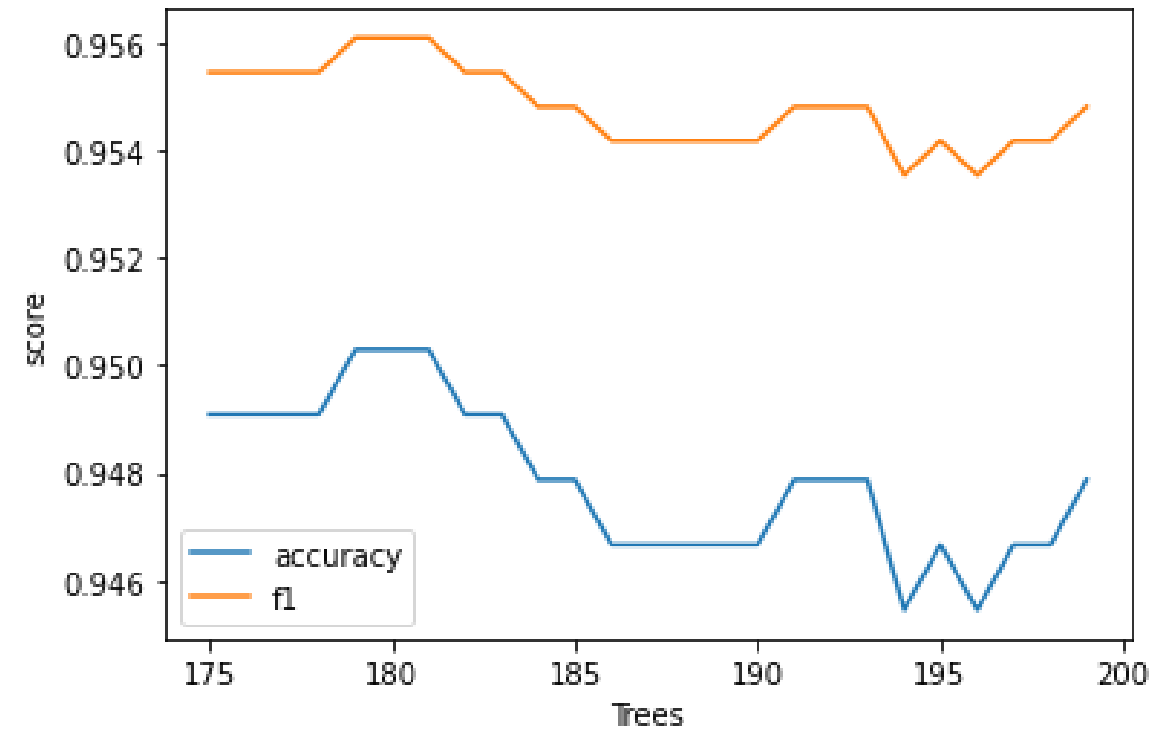


# Activity recognition optimization: Trees

**1 to 200 trees**



**175 to 200 trees**



# Activity recognition: Final results

## **Optimization / configurations**

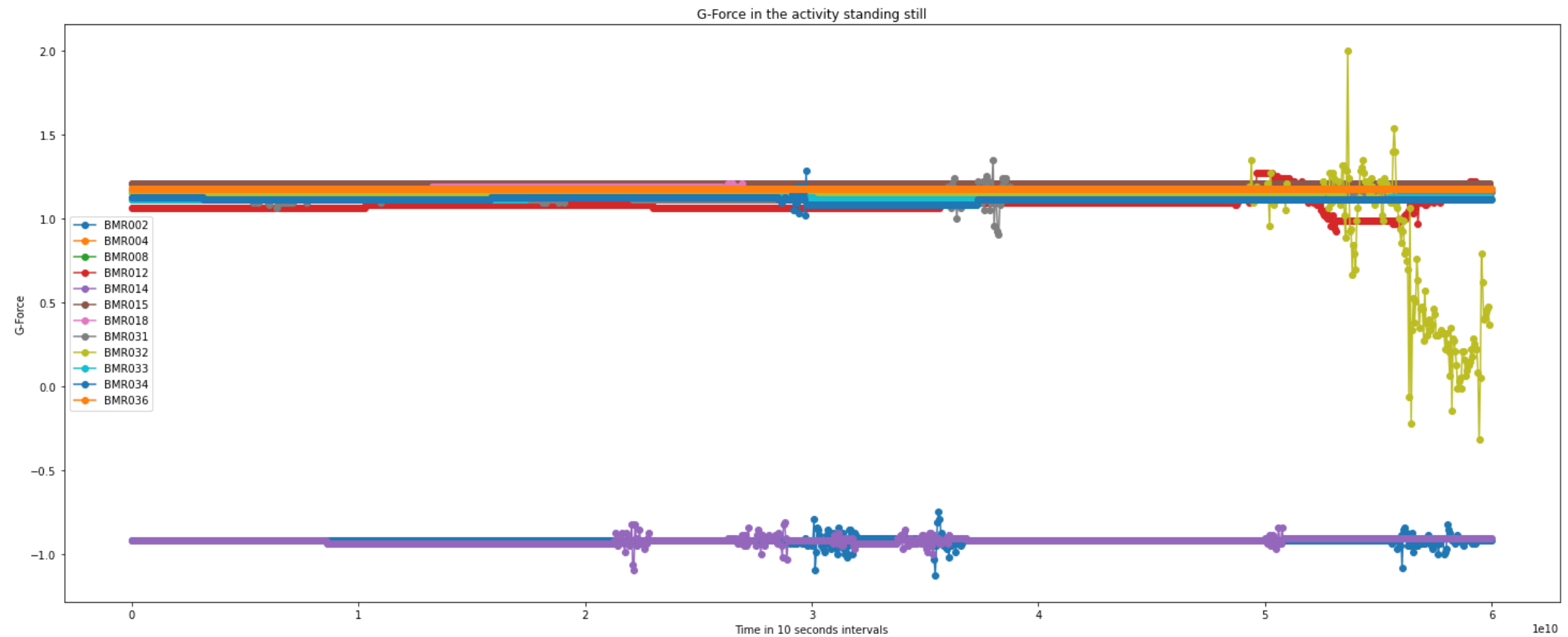
- Time segment size is 9.4s
- Amount of trees set to 179
- Random forest model

## **Results**

- Validation / training split
  - Accuracy: 95%
  - Precision: 96%
  - Recall: 95%
- Cross validation
  - Accuracy: 84% (+/- 4%)
  - Precision: 89% (+/- 2%)
  - Recall: 84% (+/- 4%)



# Data analyses





# Questions?

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