Fitness Activity Recognition

Demo 8
6/17/2022
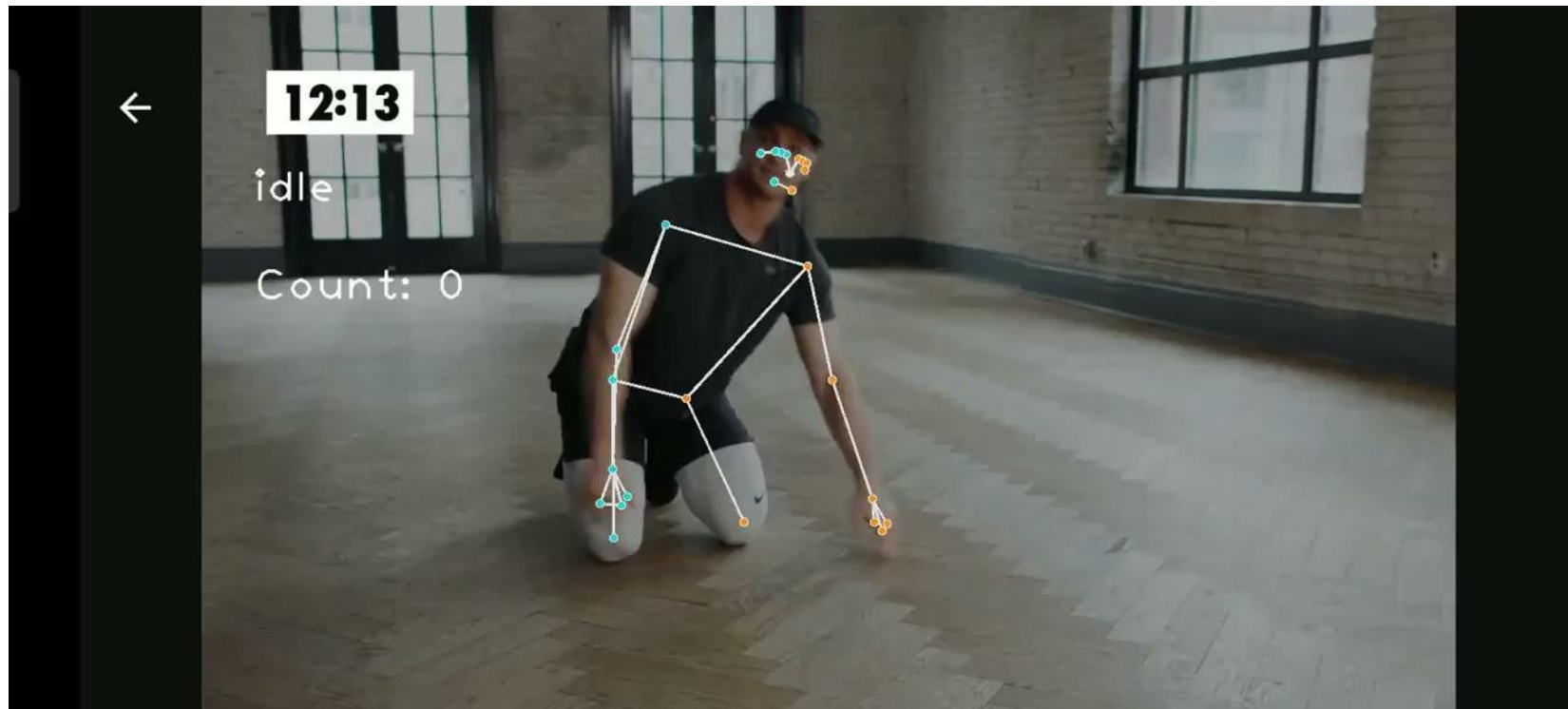
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Work for this week

- Implemented RepNet to record repetition counts for **multiple exercises** in particular video
- Started writing a draft for paper publication
- Developed meaningful metrics

Demo Videos

Testing for Publication:

BLAZEPOSE/MEDIAPIPE

	XGBoost	Extra Trees
Accuracy per instance	0.96066	0.96805
F1 Score	0.95546	0.96403
Precision	0.96066	0.96805
Recall	0.96066	0.96805

Class wise Score

	Precision	Recall	f1-score	support
Aerobic	0.95	0.92	0.93	1083
Balance Stability	0.97	0.99	0.98	4683
Calisthenics	0.98	0.97	0.98	2565
Coordination Agility	0.95	0.95	0.95	2675
Flexibility	0.97	0.97	0.97	3506
Idle	0.93	0.92	0.92	2453
Weight Bearing	0.96	0.96	0.96	2105
Weight lifting	0.96	0.95	0.95	555

XGBoost

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ExtraTrees

Testing for Publication:

MoveNet

	XGBoost	Extra Trees
Accuracy per instance	0.90663	0.92344
F1 Score	0.88949	0.90855
Precision	0.90663	0.92344
Recall	0.90663	0.92344

Class wise Score

	Precision	Recall	f1-score	support
Aerobic	0.87	0.84	0.85	3038
Balance Stability	0.90	0.95	0.93	4705
Calisthenics	0.91	0.88	0.89	2628
Coordination Agility	0.89	0.86	0.87	2671
Flexibility	0.94	0.93	0.93	3536
Idle	0.91	0.93	0.92	7481
Weight Bearing	0.95	0.92	0.94	2042
Weight lifting	0.83	0.74	0.78	676

XGBoost

Class wise Score

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ExtraTrees

Classifier Feature Importance:

- Our feature vector consists of 198 features
- First 99 are 3D coordinates
- Rest are created from feature engineering
- Masking
- Momentum
- This graph shows the 40 most important features.
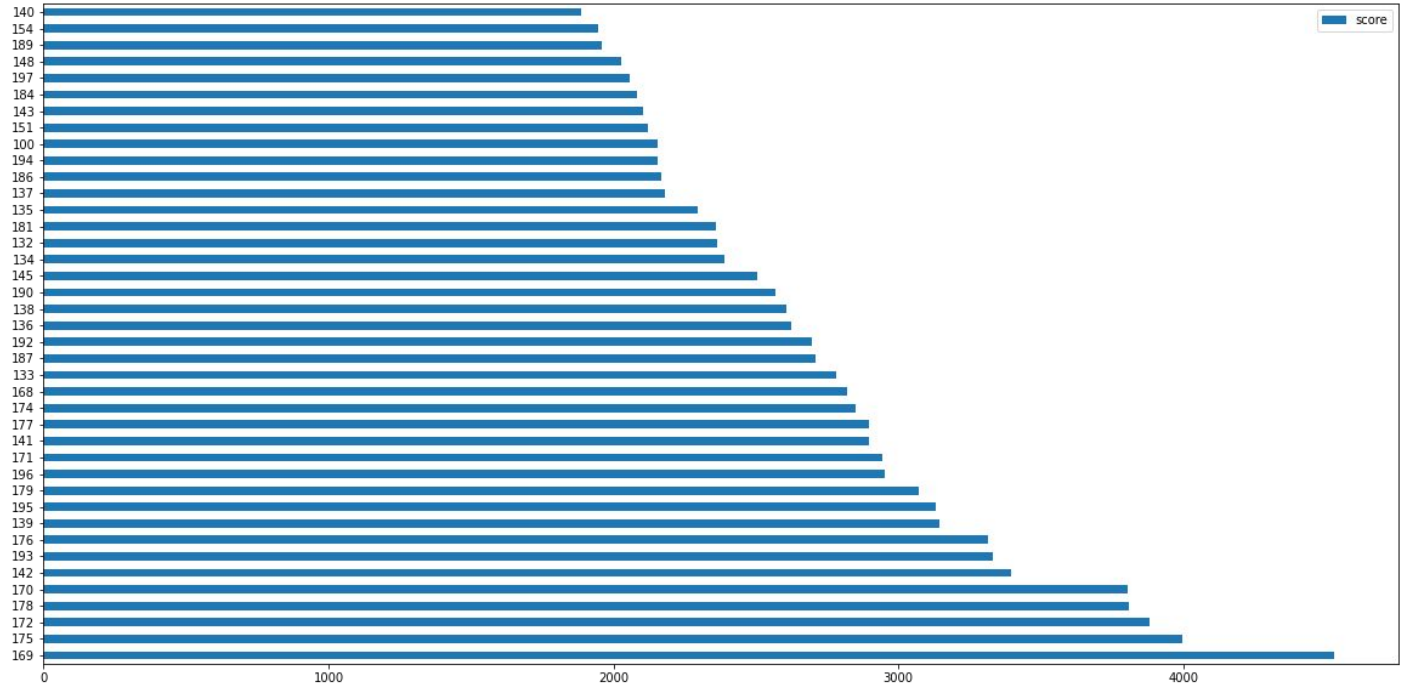
Features created from feature engineering step are most relevant!

Goals for Next Week

- Finish publication results
- Automate the functionality
- Refactor new code into current setup
- Engagement Metric
    - Get Data from Youtube ex: Videos with relevant exercises with ratings
    - Train a regressor to produce score