

M05 - Mini project

Human Activity Recognition from Continuous Ambient Sensor Data

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Unidistance

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Working hypothesis

It's possible to perform human activity recognition from continuous ambient sensor data.

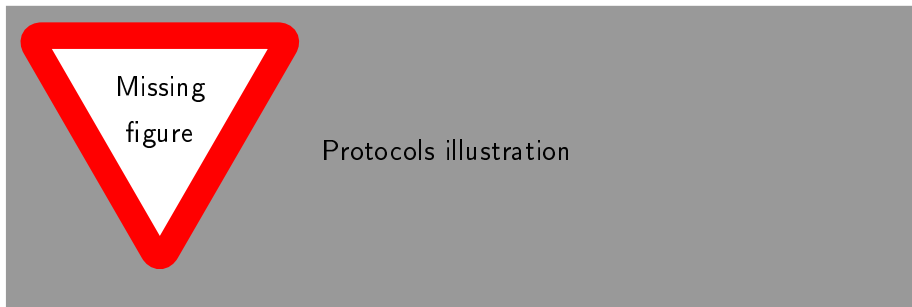
Data

Data is available online on the UC Irvine machine learning repository.

Data are downloaded automatically.

The dataset is large, it contains 36 features measured plus one output for the classification label of the activity (35 different activities), for a total of 13956534 entries.

There are two evaluation protocols:



For different experiments:

- ➊ Load the training data
- ➋ Create and train a random forest classifier
- ➌ Load the test data
- ➍ Make prediction on test data
- ➎ Print the confusion matrix for the model evaluation. Confusion matrices are also available in graphs with `plotly.express`.

The experiments run sequentially.


Version control

On github at https://github.com/sdevenes/M05_MiniProject

The work is organized using github issues to create and assign tasks.

The general approach:

- Create 1 branch per feature named *feature/feature_name*
- When the feature is complete, do a pull request with the other as a reviewer



clarified docstring for database.py	21 sept. 2020 1:05	Amara Spano <amar	1066175
docstring for paper.py	21 sept. 2020 1:03	Amara Spano <amar	9bf55bf
docstring for database.py	21 sept. 2020 0:53	Amara Spano <amar	f08a0fa
implemented test tree depth and number of trees	21 sept. 2020 0:11	Amara Spano <amar	dd2a6b9
added papers.py and implemented basic test + co	20 sept. 2020 23:54	Amara Spano <amar	05406cd
fixed deprecated warning in database.py	20 sept. 2020 23:12	Amara Spano <amar	b8aab31
Merge pull request #15 from sdevenes/feature/co	20 sept. 2020 22:09	spanoamara <32494	d6480b7
Merge pull request #13 from sdevenes/feature/alg	20 sept. 2020 22:09	spanoamara <32494	1f3742b
add automatic code documentation using sphinx	20 sept. 2020 11:25	SteveDevenes <steve	002f5c2
replace confusion matrix plot using plotly.express	14 sept. 2020 11:47	SteveDevenes <steve	2bdaf16
add analysis and test script	8 sept. 2020 16:43	SteveDevenes <steve	66cecef
add random forest algo script	8 sept. 2020 16:42	SteveDevenes <steve	272f71f
Merge pull request #2 from sdevenes/feature/split	8 sept. 2020 14:08	Steve Devènes <stev	a018adc

Unit Testing and CI

The majority of the functions in the code are covered by unit-tests, this was done using Nose python package. (percentage of coverage ?)

These tests are run at each commit through travis CI:

https://travis-ci.org/github/sdevenes/M05_MiniProject

Procuring a quick detection of bugs and errors that could appears during the project development.

Each function is commented with a docstring. The documentation is then build automatically in the CI using Sphinx at each new commit on the master branch.

Doc available here:

https://sdevenes.github.io/M05_MiniProject/index.html

Packaging and Deployment

To do