GMUM.R Package Demo

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Presentation plan

1. What, why, who?
2. Current package modules
   2.1. CEC module
   2.2. SVM module
   2.3. GNG module
What is gmum.R

- R language package containing various machine learning models

Started as a cooperation project between GMUM members and students

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- Implementing GMUM group algorithms
- User friendly package not only for computer scientists
GMUM algorithms


Currently the main team consists of 9 master/bachelor students, 1 phd student and 3 GMUM members
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Team:
- Project leader - Wojciech Czarnecki
- Maintainer/GNG developer - Stanisław Jastrzębski
- SVM team - Igor Sieradzki, Piotr Kowenzowski, Konrad Talik
- CEC team - Marcin Data, Karol Jurek, Michał Pletty
- Developers - Szymon Nakoneczny, Marcin Hatalski
- Website and additional code - Matuesz Bruno-Kamiński
- Former member - Maciej Zgliczyński
CEC aims to efficiently implement Cross Entropy Clustering Algorithm as R extension.

Cross-entropy clustering (shortly CEC) joins advantages of classical k-means with those of EM.

```r
CEC(k=3,
    x=dataset,
    control.nstart=10,
    method.type='sphere',
    method.init='random')
```
SVM

- SVM Wrapper is a part of the gmum.R project which provides a popular Support Vector Machine implementations wrapped in the R package.

- Currently we support 2 SVM engines: libSVM and SVMLight

```r
SVM(formula = Y ~ . ,
     data = ds,
     lib = "libsvm",
     kernel = "linear",
     C = 1)
```
Subpackage containing efficient, online GNG algorithm

Produces graph, that you can easily convert to igraph and save

```r
GNG(wine, 
   labels = wine$Type, 
   max_nodes = 20)
```
MNIST with GNG
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