rtemis Machine Learning & Visualization

github.com/egenn/rtemis

UCSF Penn Stanford

Powered by: R H2O.ai Spark DMLC K DMTK plotly

...and many others

1a. mplot3.* Static Graphics (base)

x: vector

```
> mplot3.x(x, c('index', 'line',
'histogram', 'density', 'qqline')
```

x: data frame

```
> mplot3.box(x)
> mplot3.bar(x)
```

x & y: vectors

```
> mplot3.xy(x, y, fit = 'gam')
```

X & Y: matrices

```
> mplot3.heat(cor(X, Y))
```

Classifier estimate and true labels

```
> mplot3.roc(probability, labels)
```

decision tree

```
> mplot3.tree(tree)
```

1b. dplot3.* Dynamic Graphics (plotly)

```
> dplot3.x(x, 'density')
> dplot3.xy(x, y, fit = 'ppr')
> dplot3.heat(cor(X, Y)
```

2. u.* Unsupervised Learning: Clustering

```
> clustSelect()
```

List available algorithms

x: matrix

```
> u.KMEANS(x, k=2)
```

3. d.* Unsupervised Learning: Decomposition

```
> decomSelect()
```

List available algorithms

x: matrix

```
> d.NMF(x, k=12)
```

4. s.* Supervised Learning: Classification, Regression, Survival Analysis

```
> modSelect()
```

List available algorithms

*x: matrix; y: vector/Surv**

```
> s.GBM(x, y)
```

**y is factor: Classification*
y is numeric: Regression
y is Surv object: Survival

Automatic hyperparameter tuning

```
> s.GBM(x, y, shrinkage=c(.001, .01),
        interaction.depth=2:5)
```

Single function to preprocess, decompose, train, tune, and test

```
> elevate(x, y, 'gbm')
```

5. x.* Cross-Decomposition

```
> xdecomSelect()
```

List available algorithms

x: matrix; z: matrix

```
> x.CCA(x, z, k=4)
```

6. meta-Modeling

Model Stacking

x: matrix; y: vector

```
> metaMod(x, y,
          base.mods=c('lgb', 'h2odl'),
          meta.mod='gam')
```

Modality Stacking

x: list of matrices; y: vector

```
> metaFeat(x, y,
           base.mods='xgblin',
           meta.mod='gam')
```

Group-Weighted Stacking

x: matrix; y: vector

```
> metaGroup(x, y,
            base.mods='xgblin',
            group=group,
            meta.mod='mdb')
```

R6 Class system

One class for each model family:

rtClust

rtDecom

rtMod, rtModCV, rtModBag

rtXDecom

- Objects contain both attributes and methods
- Support S3 generics:
  print, plot, summary, predict, etc