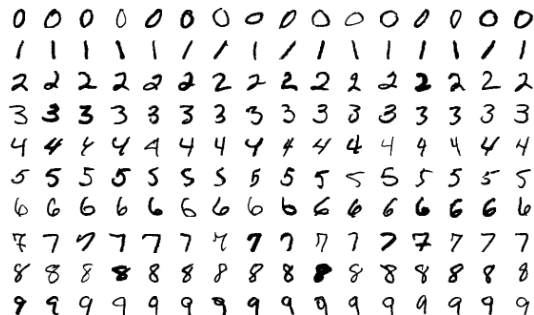


RClass — Classification via rational functions



MNIST data set, source: wikipedia

TASK

Features $\{x_1, \dots, x_N\} \subset \mathbb{R}^2$

Labels $\{y_1, \dots, y_N\} \subset \mathbb{R}$

Degree $n \in \mathbb{N}$ (fixed)

$$\min_{a_i, b_i} \max_{i=1, \dots, N} \left| y_i - \frac{p(x_i)}{q(x_i)} \right| = \left| y_i - \frac{\sum_{\alpha_1 + \alpha_2 \leq n} a_n x_{i,1}^{\alpha_1} x_{i,2}^{\alpha_2}}{\sum_{\beta_1 + \beta_2 \leq n} b_n x_{i,1}^{\beta_1} x_{i,2}^{\beta_2}} \right|$$

Classical classification via e.g.

- ▶ neural networks
- ▶ logistic regression
- ▶ support vector machines
- ▶ ...

and now

rational approximation !?

RClass — Classification via rational functions

ESSENTIAL SKILLS

- programming and visualisation skills
(preferrably Python)
- some background in analysis

USEFUL BUT NOT REQUIRED

- basic knowledge of classification techniques,
- experience with image processing

Open for: anyone

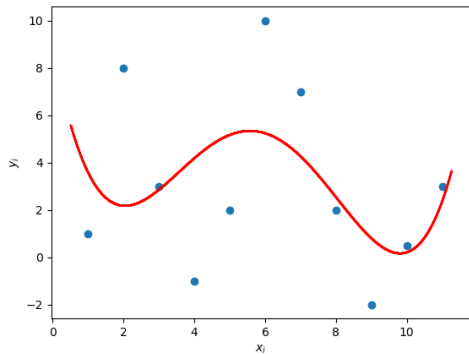
Form of examination

report (incl. code) (75%), presentation (25%)

Number of students max. 4

Workload 360 h

(weekly meetings, project work, self-study)



Questions? →

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