

Machine Learning

Self-Organizing Maps for Knowledge-Oriented Exploratory Data Analysis

Supervisors

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Keywords

Machine Learning; Online Learning; Data Visualization; Prior-Knowledge Incorporation; Self-Organizing Maps; Object Retrieval; Histopathology

Scope of work

Neural networks have recently been the object of renewed interest due to successful developments in deep-learning methods. This revival pertains not only to neural-networks-based predictive algorithms, but also involves data visualization methods such as self-organizing maps (a.k.a Kohonen maps).

Self-organizing maps, by enabling a compact sample-based representation of complex datasets offer an ideal support for two-way interactions between the system and its user.

This internship involves the development of an online learning algorithm based on self-organizing maps in order to iteratively incorporate prior-knowledge from the user into the decision model through a feedback loop.

The target application is the classification and retrieval of objects from histopathology images (breast, prostate, and colon tumors) using morphological features from the images.

Required profile

- Engineer degree or master degree student (final year)
- Strong background in mathematics and machine learning
- Experience with technical computing languages (MatLab/Python)
- Image processing experience is desirable but not a requirement

Duration 6 months

Gratification Approx. 800 € / 1,400 SGD per month



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