AA2-GCED 2021-22/QT Syllabus

1.Introduction to Kernel methods and functions. Organizational issues.

2.The Perceptron and the kernel Perceptron. Ridge regression and kernel ridge regression.

3.From the Perceptron to the Suport vector machine (SVM). The SVM for classification. VC-dimension for the SVMC.

4.Other SVMs: for regression, for novelty detection, multiclass extensions.

5.Kernels redux: definitions, properties, examples in R^p. Kernel design for data objects not in R^p.

6.Other kernel methods: kernel Nearest-neighbours, kernel PCA, kernel FDA. More methods: kernel CCA, kernel k-means, spectral Clustering; kernel LogReg.

7.Some theory: Hilbert spaces and Reproducing kernel Hilbert spaces. The Representer theorem. Advanced topics.

7 1/2. Applications (just a small selection).