

PRoNTTo course program

May 14-15, 2018

Machine Learning & Neuroimaging Lab, Computer Science Department, UCL

PRoNTTo (Pattern Recognition for Neuroimaging Toolbox) is a software toolbox based on pattern recognition techniques for the analysis of neuroimaging data. It is freely downloadable from <http://www.mlnl.cs.ucl.ac.uk/pronto/> and an introductory paper is available from <http://hdl.handle.net/2268/140242>.

Statistical pattern recognition is a field within the area of machine learning, which is concerned with automatic discovery of regularities in data through the use of computer algorithms, and with the use of these regularities to take actions such as classifying the data into different categories. In PRoNTTo, brain scans are treated as spatial patterns and statistical learning models are used to identify statistical properties of the data that can be used to discriminate between experimental conditions or groups of subjects, or to predict a continuous measure/score.

The course will therefore focus on neuroimaging data and machine learning techniques and show how these can be combined to address new neuroscientific questions. The program includes theoretical lectures, a demonstration and a practical 'hands on' session. **The course will also cover the functionalities in PRoNTTo v2.1 (e.g. multi-kernel learning models to combine different modalities/brain regions, flexible cross-validation strategies, nested cross-validation for parameter optimization, option to remove cofounds).**

Day 1 – Monday May 14th: Introduction of main concepts + demonstration

Place: ROBERTS BUILDING 421

Start	End	Title	Speaker(s)
9:30	9:45	Introduction & Motivation	Janaina Mourao-Miranda
Neuroimaging for Machine Learners			
9:45	10:30	Extracting features from sMRI	John Ashburner
10:30	11:00	Coffee-break	
11:00	11:45	Extracting features from fMRI	Christophe Phillips
11:45	12:15	Extracting features from other imaging modalities	Christophe Phillips
12:15	13:15	Lunch (not provided)	

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13:15	14:00	Pattern Recognition Methods, basics	Fabio Ferreira
14:00	15:00	Validation, Inference & Interpretation	Jessica Schrouff
Tea break			
15:30	16:15	Demonstration	PRoNTto team
16:15	17:00	Questions & Answers	PRoNTto team

Day 2 - Tuesday May 15th: Advanced concepts + practical session

Place: ROBERTS BUILDING 421 and MALET PLACE BUILDING 1.21 and 1.05

Start	End	Title	Speaker(s)
10:00	10:15	Wrap-up & Motivation	Christophe Phillips

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10:15	11:00	Kernel Methods for Pattern Recognition: SVM, KRR, MKL	Janaina Mourao-Miranda
Coffee-break			
11:30	12:15	Probabilistic Approaches for Pattern Recognition: GPC (binary and multi-class), GPR, RVR	John Ashburner
Lunch (not provided)			
13:15	14:00	PRoNTto for developers & on-going developments	Tong Wu
14:00	16:30	Practical (including tea break)	PRoNTto team
16:30	17:00	Questions & Answers	PRoNTto team
