PRoNTo Course Programme

Date: 15th-17th September, 2021 **Place:** Virtual

Machine Learning & Neuroimaging Lab, Computer Science Department, UCL

PRoNTo (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 link for download and related papers are available in the following links: Schrouff et al. 2013 and Schrouff et al. 2018.

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. PRoNTo uses pattern recognition algorithms to identify statistical properties in neuroimaging and other types of data that can be used to discriminate between classes (e.g. experimental conditions or groups of subjects), or to predict continuous measures/scores (e.g. clinical scores).

The program includes lectures on neuroimaging, machine learning and practical demonstration on how to use PRoNTo. **The course will also cover the new functionalities of PRoNTo v3.0, which includes accepting multiple data formats (e.g. NIfTI, .mat and MEEG SPM files) and enabling combining different data types in multi-modal predictive models.**

Speakers:

- Janaina Mourao-Miranda, Centre for Medical Imaging Computing (CMIC), Computer Science Department, University College London (UCL)
- Christophe Phillips, GIGA Cyclotron Research Centre *in vivo* imaging, University of Liège, Belgium
- John Ashburner, Wellcome Centre for Human Neuroimaging, UCL
- James Chapman, CMIC, Computer Science Department, UCL
- Cemre Zor, CMIC, Computer Science Department, UCL
- Konstantinos Tsirlis, CMIC, Computer Science Department, UCL

Day 1 – Wednesday September 15th: Neuroimaging for Machine Learners (times in BST)

Start	End	Title	Speaker(s)
13:00	13:10	Introduction & Motivation	Janaina Mourao-Miranda
13:10	13:50	Extracting features from sMRI	John Ashburner
13:50	14:10	Questions & Answers	John Ashburner
		Break	
14:20	15:10	Extracting features from fMRI and other imaging/data modalities	Christophe Phillips
15:10	15:30	Questions & Answers	Christophe Phillips
		Break	
15:40	16:20	Pattern Recognition Methods, basics	James Chapman
16:20	16:40	Questions & Answers	James Chapman
16:40	17:00	PRoNTo Clinic (General Q&A)	PRoNTo Team

Day 2 – Thursday September 16th: Machine Learning for Neuroimagers & Demo (times in BST)

Start	End	Title	Speaker(s)
13:00	13:10	Wrap-up previous day	Janaina Mourao-Miranda
13:10	13:40	Model Validation & Inference	Christophe Phillips
13:40	14:10	Questions & Answers	Christophe Phillips
		Break	
14:20	14:50	Model Interpretation	Janaina Mourao-Miranda
14:50	15:10	Questions & Answers	Janaina Mourao-Miranda
		Break	
15:20	16:15	Practical Demos 1 & 2	Konstantinos Tsirlis
16:15	16:25	Questions & Answers	Konstantinos Tsirlis & Janaina Mourao-Miranda

Day 3 - Friday September 17th: Advanced Concepts & Demo
(times in BST)

Start	End	Title	Speaker(s)
13:00	13:10	Wrap-up previous day	Christophe Phillips
13:10	13:50	Kernel Methods for Pattern Recognition	Janaina Mourao-Miranda
13:50	14:10	Questions & Answers	Janaina Mourao-Miranda
		Break	
14:20	15:00	Probabilistic Approaches for Pattern Recognition	Cemre Zor
15:00	15:20	Questions & Answers	Cemre Zor
		Break	
15:30	16:00	PRoNTo for developers	Konstantinos Tsirlis
16:00	16:20	Questions & Answers	Konstantinos Tsirlis & Janaina Mourao-Miranda
		Break	
16:30	17:00	Practical Demos 3 & 4	Konstantinos Tsirlis
17:00	17:10	Questions & Answers	Konstantinos Tsirlis & Janaina Mourao-Miranda
17:10	17:20	Closing Remarks	Janaina Mourao-Miranda