

**The 17th IEEE International Conference on Machine Learning and Applications  
(IEEE ICMLA'17), Cancun, Mexico  
18-20 December 2017  
[www.icmla-conference.org/icmla17](http://www.icmla-conference.org/icmla17)**

**Special Session on  
Machine Learning Applications in Psychiatric Research (MLAPR 2017)**

### **AIMS AND SCOPE**

Psychiatric research entered the age of big data with patient databases now available with thousands of clinical, demographical, social, environmental, neuroimaging, genomic, proteomic and other -omic measures.

The analyses of such data is often more challenging than in other medical research areas because i) psychiatrists study traits which are not easily measurable; they need to be measured indirectly e.g. by questionnaires, ii) the definition of a mental disease is often very broad and often includes distinct but unknown subcategories, iii) there is a high proportion of drop-out in many studies and patients often do not adhere to the treatment and iv) treatment interventions often have several interacting and it is often difficult to measure components (complex interventions). Psychiatric research therefore presents special problems for researchers in addition to the standard methodological challenges, such as the number of variables exceeding the number of patients.

Machine learning techniques are increasingly being used to address problems in psychiatric and psychological research, including bioinformatics, neuroimaging, prediction modelling and personalized medicine, causal modelling, epidemiology and many other research areas.

We would like to invite researchers from both academia and industry to participate in this workshop to present, discuss, and share the latest findings in the field, and exchange ideas that address real-world problems with real-world solutions, as well as to discuss future research directions.

This special session is open to all interested persons. Topics relevant in this workshop include but are not limited to:

Applications of Data Science in

- Prediction models of differential treatment success (Personalized medicine)
- Development of diagnostic, risk and prognostic models
- Big data and highly dimensional data analysis in psychiatric research
- Improving apparent validity of prediction models
- Methods for prediction and knowledge discovery from Electronic Health Record (EHR) data
- Adaptive clinical trials and machine learning

- Causal modelling, including Mendelian Randomization
- Neuroimaging, EEG and ERP studies
- Bioinformatics and -omics studies
- Modelling selection bias in case-control studies
- Machine learning application to reduce the problem of selective inference and low reproducibility of research studies
- Methods for predicting from streaming activity and other data from wearable sensor data and real-time prediction methods (“mobile health”)
- Handling informative missing or censored outcome data
- Identifying subgroups of patients with schizophrenia, depression or other mental health problems

### **Special Session Chairs**

*Dr. Daniel Stahl*

*Department of Biostatistics and Health Informatics*

*King’s College London, UK*

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*Dr. Daniel Stamate*

*Department of Computing*

*Goldsmiths, University London, UK*

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### **Program Committee Members**

*Prof. Fionn Murtaragh, Dep. of Computing and Mathematics, University of Derby, UK*

*Dr. Raquel Iniesta, Dep. of Medical & Molecular Genetics, King’s College London, UK*

*Dr. Danielle Belgrave, Dep. of Medicine, Imperial College London, UK*

*Dr. Sinan Guloksuz, Dep. of Psychiatry and Neuropsychology, Maastricht University Medical Centre, Netherlands, and Dep. of Psychiatry, Yale School of Medicine, USA*

*Prof. Richard Emsley, Division of Population Health, Health Services Research & Primary Care, University of Manchester, UK*

*Dr. Mattias Pierce, Division of Population Health, Health Services Research & Primary Care, University of Manchester, UK*

## **Important Dates:**

Paper Submission Deadline **August 6th, 2017**

Notification of Acceptance **September 9th, 2017**

Camera-Read Papers **October 1st, 2017**

**If you have any question about this session, please do not hesitate to email it to [daniel.r.stahl@kcl.ac.uk](mailto:daniel.r.stahl@kcl.ac.uk)**

**Daniel Stahl** is a Reader in Biostatistics and Head of the Statistical Learning Group in the Department of Biostatistics and Health Informatics of the Institute of Psychology, Psychiatry and Neuroscience (IoPPN), King's College London. He first studied animal physiology at the University of Tuebingen, Germany (1991) and a PhD degree in Behavioural Biology (1998) from the German Primate Center, Goettingen and the University of Tuebingen. He then obtained an MSc equivalent in Biostatistics (1999) from the German Section of the International Biometrical Society and worked since then as a data scientist in Behavioural biology and psychiatry. He established the UK-Prediction modelling in psychiatric research (UK-PMPR) and organized the workshop "1<sup>st</sup> Prediction modelling in psychiatric research" 2016 in London. His interest is applying statistical and machine learning methods to build robust prediction models of prognosis and of differential treatment success of psychiatric patients. He is also interested in improving the methodology to identify predictors, mediators and moderators of prediction and causal models and to develop methodologies of handling missing outcome data in medical data sets.

**Daniel Stamate** is a Lecturer in Computer Science in the Department of Computing at Goldsmiths College, University of London, and the Leader of the the Data Science & Soft Computing Research Lab. Daniel got a BSc and MSc degree in Computer Science & Mathematics from University of Iasi in Romania (1990), and a PhD in Computer Science from University of Paris-Sud at LRI Laboratory for Research in Computer Science in France (1999). His team in the Data Science & Soft Computing Lab develops fundamental and applicative research in Machine Learning and Statistical Learning, in particular in Sentiment Analysis & Stock Market Trends Prediction, in Prediction Modelling Approaches to Medical Data Mining & Precision Medicine – working in particular with the Institute of Psychiatry, Psychology and Neuroscience London and Dep. of Psychiatry and Neuropsychology at Maastricht University Medical Centre, in Mobility Big Data Analytics – working on Transport for London's Oyster smart card records, and also in Soft Computing and Algorithms, and Fuzzy Approaches to Imperfect Data Integration and Optimal Querying. Based on his research expertise, Daniel established and leads one of the first cutting edge popular Data Science MSc programmes in UK. He served in the programme comitee of several Computer Science conferences, and is currently a member of the Editorial Board of the Journal of Multiple-Valued Logic and Soft Computing.