

November 8-11, 2019 – Beijing, China

### Workshop

Workshop on Learning and Mining with Industrial Data (LMID 2019) will be held in conjunction with the 2019 IEEE International Conference on Data Mining (ICDM’2019) on November 8-11. The conference/workshop venue is in Beijing, China.

### Introduction

Digital technologies, the Internet of Things (IoT), cloud computing, and edge computing are transforming manufacturing and industry. Machine learning and data mining on industrial data have crucial impact on optimizing all aspects in the manufacturing process, including design, engineering, manufacturing, supply chain, and services. This research field also brings some challenges for learning methods, such as interconnected sensor data, real-time learning, multimodal data analysis, and resource-constrained devices. This workshop aims to bring together researchers and practitioners from academia and industry to discuss challenges, emerging topics, and recent advances in learning and mining with industrial data.

### Topics

We encourage submissions on theory, methods, and applications on various aspects in industrial data analysis. Topics of interest include, but are not limited to:

- Mining graph and networked data
- Time Series and Streaming Data Analysis
- Learning with Heterogeneous and Multimodal Data
- Scalability, Online Learning
- Low-resource Machine Learning
- Preference Learning and Opinion Mining
- Anomaly Detection, Predictive Maintenance
- Knowledge Graph and Knowledge Integration

### Submission & Publication



Submission has now closed.

All accepted submissions will be included in the IEEE ICDM 2019 Workshops Proceedings published by IEEE Computer Society Press, and will be also included in the IEEE Computer Society Digital Library (CSDL) and IEEE Xplore (indexed by EI).

## Important Dates

- Paper submission: August 18, 2019
- Paper notification: September 4, 2019
- Camera-ready deadline and copyright forms: September 8, 2019
- Workshop date: November 8-11, 2019

## Invited Speakers

Keynote Speakers: Prof. Bogdan Gabrys, University of Technology Sydney (Australia), and Prof. Xin Yao, University of Birmingham (UK) and Southern University of Science and Technology (China)

### **Prof. Bogdan Gabrys, University of Technology Sydney (Australia)**

Title: Automated composition, optimisation and adaptation of complex predictive systems

#### Abstract:

There has been a lot of work done on the subject of intelligent data analysis, data mining and predictive modelling over the last 50 years with notable improvements which have been possible with both the advancements of the computing equipment as well as with the improvement of the algorithms. However, even in the case of the static, non-changing over time data there are still many hard challenges to be solved which are related to the massive amounts, high dimensionality, sparseness or inhomogeneous nature of the data to name just a few. What is also very challenging in today's applications is the non-stationarity of the data which often change very quickly posing a set of new problems related to the need for robust adaptation and learning over time. In scenarios like these, many of the existing, often very powerful, methods are completely inadequate as they are simply not adaptive and require a lot of maintenance attention from highly skilled experts, in turn reducing their areas of applicability.

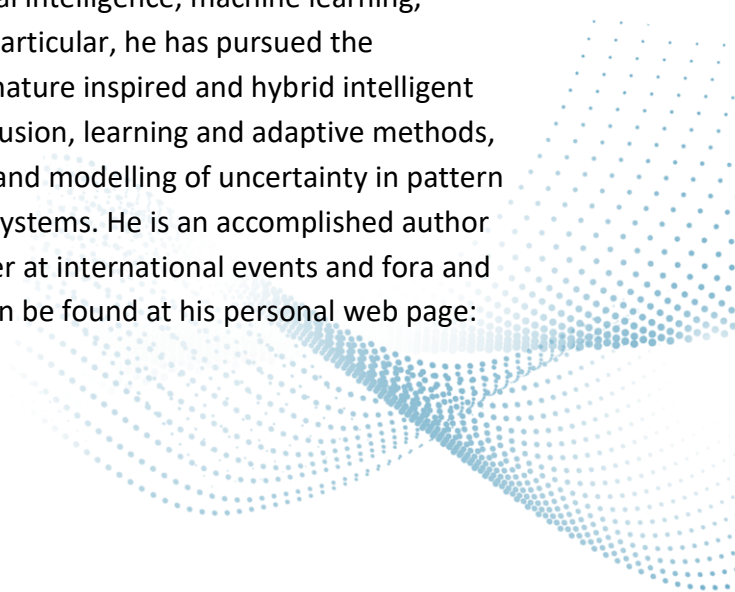
In order to address these challenging issues and following various inspirations coming from biology coupled with current engineering practices, we proposed a major departure from the

standard ways of building adaptive, intelligent predictive systems by utilising the biological metaphors of redundant but complementary pathways, interconnected cyclic processes, models that can be created as well as destroyed in easy way, batteries of sensors in form of pools of complementary approaches, hierarchical organisation of constantly optimised and adaptable components. In order to achieve such high level of adaptability we have proposed novel flexible architectures which encapsulate many of the principles and strategies observed in adaptable biological systems. The proposed approaches have been extensively and very successfully tested by winning a number of predictive modelling competitions and applying to a number of challenging real world problems including pollution/toxicity prediction studies, building adaptable soft sensors in process industry in collaboration with Evonik Industries or forecasting demand for airline tickets covering the results of one of our collaborative research projects with Lufthansa Systems.

Following the drive towards automation of predictive systems building, deployment and maintenance, recent work at Prof. Gabrys' group resulted in an approach and an open-source software which allows to automatically compose, optimise and adapt multicomponent predictive systems (MCPS) potentially consisting of multiple data preprocessing, data transformation, feature and predictive model selection and postprocessing steps. Our findings, supported by extensive experimental analysis, can have a major impact on development of high quality predictive models as well as their maintenance and scalability aspects needed in modern applications and deployment scenarios. All of these will be covered and discussed during this talk.

**Biography:**

Bogdan Gabrys is a Data Scientist, a Professor of Data Science and a Director of Advanced Analytics Institute at the Faculty of Engineering and IT, University of Technology Sydney, Australia. His research, consulting and advisory activities have concentrated on the areas of data science, complex adaptive systems, computational intelligence, machine learning, predictive analytics and their diverse applications. In particular, he has pursued the development of various statistical, machine learning, nature inspired and hybrid intelligent techniques especially targeting data and information fusion, learning and adaptive methods, multiple classifier and prediction systems, processing and modelling of uncertainty in pattern recognition, diagnostic analysis and decision support systems. He is an accomplished author (with over 150 publications), frequently invited speaker at international events and fora and sought after data science expert. More information can be found at his personal web page: [HTTP://BOGDAN-GABRYS.COM/](http://BOGDAN-GABRYS.COM/)



**Prof. Xin Yao, University of Birmingham (UK) and Southern University of Science and Technology (China)**

Title: TBC

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TBD

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## **Impressum**

## **Data Privacy Statement**

