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# WT2.9: University of Bradford

# Report

## Activities performed during the visit at the Wroclaw University of Technology

Task leader name: Urszula Markowska-Kaczmar

Visiting person name: prof. Daniel Neagu

Period: 28.04.2016 -20.05.2016

Authors: Daniel Neagu and Urszula Markowska-Kaczmar

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## Personal Information

Professor Daniel, faculty member of The University of Bradford, UK, visited Wroclaw University of Technology, Wroclaw (Poland), Department of Computational Intelligence, in the period from 28.04.2016 to 20.05.2016. The visit was focused on the research and training collaboration activities in the field of machine learning techniques and applications in big and open data, with case studies in healthcare, predictive toxicology and automotive industry.

## Seminars

During this visit there were some official events open for the whole University attendees, as follows:

Daniel Neagu participated on 12th May 2016 to the research seminar delivered by Mr. Sergio Gallego from University of Granada (ENGINE's partner) on "Data pre-processing on streaming data" (Technopolis, room D2.1, from 12:00). Daniel Neagu contributed to the discussions and provided feedback to the audience on similar challenges and approaches. Daniel Neagu enjoyed the talk and appreciated the exhaustive review of techniques regarding approaches to concept drift. Daniel Neagu shared his minutes of the presentation and provided a review of the talk and discussions with WrUT representative Dr Urszula Markowska-Kaczmar.

Daniel Neagu has presented a 2-hour research seminar followed by a hands-on session on Mining Open Data on Monday 16 May. The event was delivered to a consistent audience of academic researchers, research students and registered undergraduate and postgraduate students. Below is the content of the invitation sent by Professor Halina Kwasnicka, Head of Department of Computational Intelligence at Wroclaw University of Technology to the potential audience:

Title: Mining Open Data

Presenter: Daniel Neagu, Professor of Computing at the University of Bradford.

Date and place: 16 of May at 13:15

Venue: room 22, building C3, Wroclaw University of Science and Technology

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Abstract:

Big Data technologies offer new opportunities to access, collect and share vast amounts of digital information. One of the initiatives that benefits from the new technologies is the Open Data availability that changes dramatically the way our society works. Web Science, Data Science, Data Journalism, e-Health, e-Marketing and e-Government all benefit from, and contribute to Open Data i.e. data that anyone can access and use. Open Data-driven companies, policies and applications are already a regular presence in the digital economy. The talk will review definitions, context, policies, resources, applications, challenges and opportunities from using Open Data. Applications developed by the University of Bradford researchers and students will demonstrate and support the concepts and ideas presented.

For applications, we will use KNIME. KNIME (https://www.knime.org/) is an open platform for data mining that can be extended with additional packages and libraries if wanted. It comes in formats for iOS, Windows and Linux. Follow the installation steps from the Getting Started web link (http://tech.knime.org/knime) to download and install it, and follow the Download Now (https://www.knime.org/downloads/overview) web link if you'd like to register with the KNIME forum. KNIME works also well with R and WEKA:

- R: (https://www.r-project.org/) is a free s/w environment for statistical data processing and visualisation;

- WEKA (http://www.cs.waikato.ac.nz/ml/weka/downloading.html) is a Java-based free software workbench.

Short Bio:

Dr Daniel Neagu is Professor of Computing at the University of Bradford, and the leader of AIRe (Artificial Intelligence Research) group. His research focuses on Machine Learning techniques applied in Data Governance, Healthcare, Toxicology, Software Engineering, and Social Network Analysis. Daniel is ACM, IEEE CS and CIS, and BCS member. More details and publications are available at: http://computing.brad.ac.uk/staff/dneagu

Academic Administration activities

Professor Daniel Neagu met Dr Urszula Markowska-Kaczmar on 28 April 2016 (the day of his arrival) and had a kick-off meeting and discussion on planning the visit activities, and also the accommodation and administrative arrangements. He has been introduced to the Head of Informatics Professor Huzar, who has facilitated access to the building during the weekends and afternoons, and the Secretary of the Department Ms Urszula Laskowska, who has provided administrative and secretarial support during the visit. Professor Neagu and Dr Markowska-Kaczmar have also visited and discussed financial and administrative arrangements with the ENGINE administration.

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# Scientific activities

*Publications:*

There were in-depth working meetings and follow-up actions on two ain topics for research publication initiatives on:

The contribution paper "Can Feature Contributions Be Used for Evaluation of Neural Network Prediction Reliability for New Data?" Daniel Neagu and Urszula Markowska-Kaczmar co-author with Dr Anna Palczewska (currently from University of Leeds Institute for Data Analytics, formerly with the Artificial Intelligence Research Group led by Professor Daniel Neagu at the University of Bradford). There was significant advance in the theoretical and formalism description of the contributions, editing and clarification of the experimental work. This has been achieved in 4-hour meetings in Wroclaw (on 6 May , 12 and 17 May) and online discussions, plus the individual contributions of the co-authors. The paper is currently in advanced stages of proofreading and detail polishing, with a view to be submitted to a world-leading peer-reviewed journal in soft computing/ machine learning techniques. This original work is centred in the ENGINE collaborations described in the project contract regarding machine learning technologies applied to predictive toxicology.

A review paper on Big Data Technologies in Automotive Engineering is discussed, with a preliminary plan and resource gathering agreed. This is a continuation of initial discussions with the research groups of Professors Neagu and Campean (leader of the Automotive Research Centre) and will extend the collaboration focus of the ENGINE partners in applications relevant to the engineering, particularly automotive engineering, applications, including deep learning technologies that are part of the WrUT colleagues' expertise.

*Future research collaborations and project proposals*

Professor Daniel Neagu discussed with the WrUT team in a number of meetings his research group current plans for project funding. An initial meeting on 9 May 2016 with Professor Halina Kwasnicka and Dr Markowska-Kaczmar reviewed Professor Neagu's main initiatives for 2016/2017 to identify and develop opportunities for further research collaboration. This meeting identified as a potential fruitful collaboration H2020 Public Private Partnership calls for applications of big data to personalised and efficient patient healthcare. This also included discussions of possible partners from hospitals, and regulatory institutions.

A follow-up meeting to develop and identify potential local partners has been called on 13 May 2016 with participation from local hospitals and healthcare regulatory bodies (Dr Andrzej Konieczny, mgr Violetta Cymbała), WrUT NLP (Maciej Piasecki) and Computational Intelligence (Professor Kwasnicka, Dr Markowska-Kaczmar and Michal Joachimiak) research groups. The meeting was fruitful, with a number of actions to be followed-up on data identification, coordinator and potential EU partners profile to be added at later stages.

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This initiatives aligns well with the ENGINE collaboration regarding building collaborative proposals and continuing the fruitful work developed in ENGINE in the incoming period.

Prof. Neagu participated in two special sessions and poster presentations at the CORES'2015 conference. During the breaks we discussed with conference invited speakers and attendees, mainly from University of Notre Dame, Virginia Commonwealth University, University of Porto and WrUT. He also attended undergraduate student project tutorial: discussions with students and academic staff on projects, employability and academic curriculum.

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