



BU PhD STUDENTSHIPS 2017

PROJECT DESCRIPTION

PROJECT DETAILS
Project Title
Novel Machine Learning Classification Technique for Automation of Microinsurance Underwriting
Project Summary
<p>The main aim of the project is to investigate and develop a novel deep artificial neural network classification to model and automate microinsurance underwriting process.</p> <p>The term "microinsurance" typically refers to insurance services offered primarily to clients with low income and limited access to mainstream insurance services and other means of effectively coping with risk. The sector has grown significantly around the world. However, in the underwriting process, human decision makers are employed to evaluate new applications. This is time consuming and increases the related operation cost. As a result, it will inevitably affect the insurance cost, which is a significant factor in microinsurance. Moreover, there can be a large amount of variability in the underwriting process when performed entirely by human underwriters.</p> <p>Recently, we have seen the rapid rise of artificial intelligence (AI) and machine learning methods. Over the last decade there has been increasing interest in applying the techniques to different areas, such as telecommunication industry, banking, insurance companies and gaming.</p> <p>Many methods have been used to automate the processes, make decision and provide insights for business. Such methods include Artificial Neural Networks, Decision Trees Learning, Regression Analysis, Logistic Regression, Support Vector Machines, Naïve Bayes, Sequential Pattern Mining and Market Basket Analysis, Linear Discriminant Analysis and Rough Set Approach. In addition, related data volume has also been increasing significantly making the learning and classifying algorithms much more accurate.</p> <p>Some work has been done using Fuzzy Rule-Based Classifier to automate the underwriting process. However, they highly depend on correctly identify and development of fuzzy rules. In addition, most of the works done in this field are applied to insurance industry in general.</p> <p>Unlike existing methods, the project will investigate and develop a novel deep artificial neural network classification, specifically for microinsurance sector. The method will be used to help automate the underwriting process. Data from micro insurance companies will be used to develop and train the networks. The developed method will be evaluated in a real-world situation in an insurance company.</p>
Academic Impact
<p>This research project and its underlying publications will lead to a REF case study. This research falls under the REF UoA11 area and will help develop a practical system. The work done as part of this PhD can lead to a prototype an autonomous underwriting system. We foresee that this PhD project will open a new research direction and increase BU's presence in this emerging research area. With the novelty of the approach, it is expected that a number of high quality (3* or 4*) journal articles will be published, and the objective of the project is in line with BU's vision on fusion.</p>
Societal Impact
<p>The method developed in this research will directly serve the company and insurance industry. In addition, the research will lead to the further development of automated systems in other parts of insurance industry.</p>
Training Opportunities

The project will be supervised by Dr Simant Prakoonwit (the Lead Supervisor) and Dr Wajid Khan (Sponsor Supervisor). As mentioned above, both supervisor is successfully supervising a computing/business BU Matched-Funded PhD project with another company.

The student will also be working closely with the Company which will provide all crucial real-world practice and experience in the industry.

The student will be part of an active research student community in the Department and Faculty and will integrated into our research team. Generalist and specialist development needs of individual student will be identified and delivered. The personal, professional, career learning and development will be provided. The student will have access to, and are encouraged, by peer to peer learning and support. There are mechanisms for supervision and monitoring of both student and supervisor.

Apart from training programs the Doctoral College offers, in the Faculty of Science & Technology (SciTech) runs a series of research presentations and seminars for PhD student and academic staff to discuss wider views and exposure to research methodology and strategy.

SUPERVISORY TEAM	
First Supervisor	Dr Simant Prakoonwit
Additional Supervisors	Dr Wajid Khan (External)
Recent publications by supervisors relevant to this project	<ul style="list-style-type: none"> • Selamat, S., Prakoonwit, S., Sahandi, R., Khan, W., Ramachandran, M., 2017. Big Data Analytics: A Review of Data Mining Models for SMEs in the Transportation Sector. Journal WIREs Data Mining & Knowledge Discovery, Wiley. In press. • Khan, W., Selamat, S., Ramachandran, M., 2017. Appraisal of Transactional Data through Visualisation for SMEs. Book chapter submitted to E-Manufacturing and E-Service Strategies in Contemporary Organizations publication of IGI Global, In press. • M. Ramachandran, R. Sahandi, S. Prakoonwit, W. Khan, S.A. Mohd Selamat, "Mathematical Model of Safety Score Calculation for validation of coach operators in the UK", Proceedings Intelligent Transport Systems-2017, Finland • M. Ramachandran, R. Sahandi, S. Prakoonwit, W. Khan, S.A. Mohd Selamat, "A cloud based safety transport model for validation of UK coach operators for school journeys", Proceedings Intelligent Transport Systems-2017, Finland • S. Garcia Cardona, F Tian, S. Prakoonwit, "Tenochtitlan-An Interactive Virtual Reality Environment That Encourages Museum Exhibit Engagement, Proceedings 11th Edutainment 2017, UK • D. Savosin, S. Prakoonwit, F. Tian, "Representation of interactable objects and action sequences in Virtual Reality using hand gesture recognition", Proceedings 11th Edutainment 2017, UK • A. Simons, K. Pedersen, J. Fonseca, S. Prakoonwit, "What's wrong with the feedback?", Proceedings 11th Edutainment 2017, UK. • M. Ramachandran, R. Sahandi, S. Prakoonwit, W. Khan, "Intelligent Safety Transport Framework for Schools: a Review of Route Planning and Tracking Systems", 2016 5th International Conference on Transportation and Traffic Engineering (ICTTE 2016), Lucerne Switzerland, 6-10 July, 2016. • N. Boosim, S. Prakoonwit, "Car make and model recognition under limited

	<p>lighting conditions at night”, Pattern Analysis and Applications, Springer, (Open Access) May 2016. DOI: 10.1007/s10044-016-0559-6</p> <ul style="list-style-type: none"> • N. Boonsim, S. Prakoonwit, “An Algorithm for Accurate Taillight Detection at Night”, International Journal of Computer Applications, Volume 100, Number 2, August 2014 • A. Kanamgotov, L. Koshy, M. Conrad, S. Prakoonwit, “User Avatar Association in the Virtual Worlds”, Cyberworlds 2014, Santander, Spain. • S. Prakoonwit, “Towards Multiple 3D Bone Surface Identification and Reconstruction Using Few 2D X-ray Images for Intraoperative Applications, International Journal of Art, Culture and Design Technology, Volume 4, Number 1, Jan-Jun 2014 (invited by the Editor) • N. Boonsim, S. Prakoonwit, “License Plate Localization based on Statistical Measures of License Plate Features”, International Journal on Recent Trends in Engineering and Technology, Volume 10, Number 1, Jan 2014 • S. Prakoonwit, R. Benjamin, “3D surface reconstruction from multiview photographs images using 2D edge contours”, 3D Research, Volume 3, Number 4, 2012 • Kanamgotov, A. Christopoulos, M. Conrad, S. Prakoonwit, Immersion in Virtual Worlds – but not Second Life!, Cyberworlds 2012 (IEEE/ACM), 25-27 September 2012, Darmstadt, Germany. • S.Prakoonwit, “Finding a Set of Optimal Viewing for 3D Surface Reconstruction from 2D X-ray Images using Genetic Algorithm“, CIS 2010 (IEEE), Sept 2010, UK • S. Prakoonwit “3D Reconstruction from few Silhouettes using Statistical Models and Landmark Points”, CW2010 (IEEE/ACM), October 2010, Singapore
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INFORMAL ENQUIRIES
<p>To discuss this opportunity further, please contact Dr Simant Prakoonwit via email: sprakoonwit@bournemouth.ac.uk</p>
ELIGIBILITY CRITERIA
<p>Studentship candidates must demonstrate outstanding academic potential with preferably a 1st class honours degree and/or a Master’s degree with distinction or equivalent Grade Point Average. An IELTS (Academic) score of 6.5 minimum (with a minimum 5.5 in each component) is essential for candidates for whom English is not their first language. In addition to satisfying basic entry criteria, BU will look closely at the qualities, skills and background of each candidate and what they can bring to their chosen research project in order to ensure successful completion.</p> <p>Additional Eligibility</p> <p>Studentship candidates should have knowledge of both AI/Machine Learning and insurance business.</p>
HOW TO APPLY
<p>Please complete the online application form by 15th January 2018. Further information on the application process can be found at: www.bournemouth.ac.uk/studentships</p>