

PhD Studentship

The Human Resource Management challenge of predicting employee turnover using machine learning

Closing date: Monday 25th May 2020

Interview date: Monday 22nd June 2020

Supervisory team:

Director of Studies:

Dr Chris Bowers, Department of Computing, Worcester Business School

Supervisor:

Dr Lynn Nichol, Department of Management and Finance, Worcester Business School, University of Worcester

The Project:

Applications are invited for a fully-funded full-time PhD studentship exploring The Human Resource Management challenge of predicting employee turnover using machine learning.

Context

Applications of machine learning have the potential to significantly impact upon the role of Human Resource Management by automating both novel and existing objectives that are difficult or costly to achieve currently. One such example is the ability to predict employee attrition and identify its underlying causes. This has the potential to not only improve employee retention but also productivity, well-being and robustness. However, this potential also harbours additional challenges and demands. The successful application of a machine learning approach is reliant on appropriate quantity and quality of data. This could lead to increased monitoring and tracking of quantified employee performance and engagement. This may involve data gathering perceived as intrusive by employees such as location, activity and behaviour monitoring. Conversely, without appropriate data, machine learning may be more prone to increased error which could have significant potential impact on individuals in the form of improper predictions.

Aims

This research will explore the above challenges through applied research. It aims to examine the practicalities of applying machine learning to turnover prediction, the identification of key indicators in attrition and how this might inform data-driven retention strategies.

Objectives

To design, build and evaluate an employee turnover prediction tool.
To examine the performance, capabilities, limitations and challenges of such a system applied in a real-world context.

Indicative methodology

Evaluate predictive performance of a range of supervised machine learning approaches to a real-world data set. Use statistical methods to identify and describe correlated variables from the real-world data. Use qualitative/quantitative methods to measure impact of related factors and how they influence decision making from either employee or employer perspective.

References

Harrison, T. Nichol, L. Gatto, M. Wai M. Cox. A. Gold, J (2018) What will be the Surprises for HRD in 2028? A Futures Scenario. *International Journal of HRD Practice, Policy and Research*. Vol 3 No 2 63-71. doi 10.22324/ijhrdppr.3.113.

García, D.L., Nebot, À., & Vellido, A. (2016). Intelligent data analysis approaches to churn as a business problem: a survey. *Knowledge and Information Systems*, 51, 719-774.

Zhao Y., Hryniewicki M.K., Cheng F., Fu B., Zhu X. (2019) Employee Turnover Prediction with Machine Learning: A Reliable Approach. In: Arai K., Kapoor S., Bhatia R. (eds) *Intelligent Systems and Applications. Advances in Intelligent Systems and Computing*, vol 869. Springer

Tambde, A. Motwani, D. (2019) Employee Churn Rate Prediction and Performance Using Machine Learning. *International Journal of Recent Technology and Engineering (IJRTE)* 8(2S11):824-826

Essential Criteria:

Applicants should have or be able to evidence:

- Education to Masters Degree level in a relevant area.
- A First or Upper Second (2.1) Honours Degree

A sound understanding of, and interest in several of the following areas:

- Machine Learning / Artificial Intelligence
- Human Computer Interaction
- Qualitative / Quantitative Research Methods
- Ability to contribute to research study design
- Computer literacy
- Proficiency in oral and written English
- Ability to organise and meet deadlines
- Good interpersonal skills
- Ability to work independently and contribute to a team
- Commitment and an enthusiastic approach to completing a higher research degree

Desirable Criteria:

- Existing connections/links with appropriate communities/groups
- Human Resource Management

Details of the studentship:

During the period of your studentship you will receive the following:

- a tax free bursary of £15,009 for a period of 3 years
- a fee-waiver for 4 years
- a budget to support your project costs for the first 3 years of the project
- a laptop
- use of the Research Student Study Space in Research School

You will be expected to play an active role in the life of both the Research School and of Worcester Business School. You will be given opportunities to gain experience in learning and teaching within the School under the guidance of your Director of Studies.

Application Process:

To begin the application process for this studentship please go to our webpage www.worcester.ac.uk/studentships and click apply now next to the project you wish to apply for.

The Interview:

The interview will provisionally be held on Monday 22nd June 2020. All successful, shortlisted applicants will be interviewed. The interview process normally lasts around one and a half hours in total and includes a meeting with the project supervisors, and an opportunity to view the campus and the Research School.

In advance of interview, shortlisted candidates will be asked to submit:

- A sample of written academic work.

Shortlisted applicants invited for interview will be asked to give a 10-minute presentation based on their proposed research approach.

Research at the University of Worcester:

Research at the University of Worcester has grown significantly over the last 10 years. This growth is reflected in the outcomes of the Research Excellence Framework (REF 2014). Worcester was the most improved University in the UK based on Research Fortnight's "Research Power" measure, reflecting a more than four-fold increase in the number of staff submitted compared to RAE 2008 and a commensurate increase in the quality of the research. The University will submit 50% more staff to REF 2021 than in 2014 and is expecting significant further improvements in its outcomes. It is also reflected in the increase in Research & Knowledge Exchange funding over this period. The University has been successful in winning funding from a wide range of major funders: Research Councils such as AHRC, BBSRC, ESRC and NERC; major charities such as the Leverhulme Trust, the Alzheimer's Society and the British Academy; health-research funders such as the NIHR, the Department of Health and local NHS Trusts; European funding through Horizon 2020 and Erasmus+; and funding from local, national and global businesses.

The University is focused on research which addresses real world challenges and provides solutions to these challenges:

- **Human Health and Wellbeing** with research groups looking, for example, at mood disorders, dementia care, biomedical research, and violence prevention
- **Sustainable Futures** with research groups looking, for example, at crop protection, eco-system services, aerobiology and sustainability education
- **Professional Education** with research groups looking, for example, at the social psychology of education and the philosophy and ethics of professional practice)
- **Identity and Inclusion** with research groups looking, for example, at social justice, inclusive approaches to sport, religion & society, and Early Modern culture & society

The University continues to provide a robust infrastructure for research. It has a well-established Research School which houses its growing research student body and which provides a comprehensive programme of researcher development for staff and students. It established a Research Office in 2013, responsible for research funding, governance and strategy. The University is committed to further developing its research profile, through a strategic approach to its support for and investment in research. Its fully-funded studentships are part of this investment.

Research School

The Research School is a focal point for all our research students. It provides:

- day-to-day support for our students, both administrative and practical, through our dedicated team
- a Research Student Study Space with both PCs and laptop docking station
- a comprehensive Researcher Development Programme for students and their supervisors
- a programme of student-led conferences and seminars

Worcester Business School

WBS research is rooted in local, regional, national and international contexts and benefits our students through our focus on research-informed teaching and our innovative research degree program.

Research is focused in the School in the three main Department areas of Computing, Management and Finance and Marketing as well as through our four cross-discipline Research Groups:

- Applied Computing
- Careers and Leadership Development (CLDG)
- Customer Interactions Research Group (CIRG)
- Managing Risk, Operations and Sustainability (MORS)

We have always been conscious to avoid 'ivory tower' research for its own sake and ensure our links to public and private sector organisations keep us in touch with constant change.

Widening Participation:

As part of its mission statement the University is committed to widening participation for its higher degrees. Although most candidates will have an undergraduate and/or a Masters degree, the University is happy to accept applications from candidates with relevant professional qualifications and work related experience.

For further information or an informal discussion on this project, please contact Dr Chris Bowers (Director of Studies) via email at c.bowers@worc.ac.uk

Applications can be online made at: www.worcester.ac.uk/studentships