Accenture Turing Strategic Partnership

Accenture Turing Strategic Partnership: Expression of Interest (KI – Lloyds of London Insurance Market Modelling)

The Alan Turing Institute, as the UK's national institute for data science and artificial intelligence, plays an important part in driving forward advances in these technologies to change the world for the better.

The Institute is named in honour of Alan Turing, whose pioneering work in theoretical and applied mathematics, engineering and computing is considered to have laid the foundations for modern-day data science and artificial intelligence. The Institute's goals are to undertake world-class research, apply its research to real-world problems, driving economic impact and societal good, lead the training of a new generation of scientists, and shape the public conversation around data and algorithms.

After launching in 2015 with government funding from the Engineering and Physical Sciences Research Council (EPSRC) and five founding universities, the Institute has grown an extensive network of university partners from across the UK and launched several major partnerships with industry, public and third sector. Today it is home to more than 500 researchers, a rapidly growing team of in-house research software engineers and data scientists and a business team.

The Accenture Turing Strategic Partnership

The Finance and Economics programme at The Turing brings together leading experts in data science, machine learning, finance, and the social sciences, from both academia and industry to tackle the most challenging questions by producing world-leading research with significant impact. We inform public policy and enable trusted, research-led thought leadership. The programme works closely with government and industry to exploit the potential of new technologies in the financial sector and economic research, and to position the UK as a global leader in these areas.

In 2020 we launched a five-year Strategic Partnership with Accenture. This builds on an existing three-year alliance to create a world-leading strategic partnership in advanced data science, data analytics and artificial Intelligence (AI) research with a focus on delivering substantial business and societal value via:

a) delivering value from AI and data.

b) enabling safe and robust application of AI and.

c) lowering barriers to AI adoption.

Our partnership has several interconnected workstreams. This call falls under our Use Case Commercialisation pillar where we work with Accenture and their clients to deliver shorter scale research projects that have a direct impact on real world use cases. In turn, researchers gain

access to datasets and issues that would not be possible without collaboration with our commercial partners.

This particular call has been developed in collaboration with Accenture and KI, the first digital algorithmically driven syndicate on the Lloyds of London insurance market. Together, we want to model the Lloyds of London market.

Background

The project aims to create a model which simulates the behaviour of the Specialty Insurance market. A reasonable model will provide insight into some of the market dynamics, and an understanding of how model-able (or not) the market is. If successful, the project will:

- Be able to recreate and better understand some of the market dynamics/underwriting cycles which drive pricing, at least qualitatively.
- Draw some sort of sense of the impact and drivers of these dynamics.
- Draw out heuristics which will help us better predict or estimate the current and future market environment - which would be helpful In planning portfolios of business.

If this work is successful there will be ancillary benefits to regulators to help them quantify the market dynamics and expose/investigate any market level phenomena.

Approach

Previous work looking at retail insurance, undertaken by Cass Business School [1,2] has had some success with agent based modelling approaches where the various parties involved in the market are represented (brokers, syndicates, cat-bonds, etc.)

This project aims to explore this approach further with the introduction of additional complexities unique to the complex commercial insurance market:

- The fact that risk is syndicated.
- Price elasticity and the impact of trading relationships within the market versus retail markets
- More balance ration between brokers and underwriters compared to retail

We note however that there might be completely tangential approaches that help derive increased insights into the how the market operates which have not been articulated here. For example a project may want to explore a Reinforcement Learning approach to learn, manage and operate within the market dynamics without necessarily driving an increased understanding of said dynamics (which agent based modelling allows for). As such, we welcome applications proposing other methodologies as well.

Data

Previous studies have used aggregated data provided by the Association of British Insurers (ABI) or dummy data. We should be able to improve on this this and combine these sources with historical proprietary data that would be valuable to research in this field.

This data could include:

- The direct experience that Brit has on individual risks
- Data from regulators, which Brit/Ki have access to (subject to permission from said regulators)

Timelines

This project aims to begin work in April 2023. The initial funding is for one year, but if the initial year is successful, there is potential to continue the project for an additional year. In the initial year, we hope to have produced:

- Review of existing approaches
- A prototype codebase that runs simulations with multiple agents and mines it for insights under a variety of assumptions which can be tweaked.
- A paper(s) outlining the success (or otherwise) of said simulations, ideally published in an academic journal

The Team

The successful applicants would be working alongside a team of data scientists and SMEs from KI as well as Accenture. All team members will be seconded into Ki for the duration of the project. This will allow easy access to KI in-house data and infrastructure required to run the project, as well as to increase collaboration and communication between parties during the project.

Assessment and eligibility criteria

Researchers (Turing Fellows, Turing Research Fellows, Doctoral Student Supervisors, and others) and other academics from our partner universities may apply to this research call. Applications from academics employed by other UK-based universities will also be considered.

All applications will be assessed by a multi-disciplinary panel. The panel are seeking projects that can demonstrate:

- Knowledge of the mechanics of insurance markets.
- Demonstrable applicability to business decision making.

- The suitability of the proposed methodology and the appropriateness of the approach to achieving impact.
- Opportunities for engagement with the Turing network and Accenture stakeholders.

Funding available

- We have £150,000 to award through this call to fund the first year of the project.
- In special circumstances there may be an opportunity to increase the funding awarded for an outstanding project.

We will notify applicants at the final stage if additional funding will be made available.

Eligible costs

- The funding can be used for direct and indirect costs.
- The Turing will pay full overheads/ 100% Full economic cost (FEC).
- Direct costs are on FTE basis of personnel working directly on the project – this could include, for example, PIs, postdocs, data scientists or software engineers.
- Other costs could include:
    - Travel and subsistence for project researchers when away from host university (e.g., attending conferences, travelling to/from the Turing)
    - Conference fees where the conference is directly application to the research project
- Studentships will be covered, but please note that they will be contracted under the Turing's funding agreement template.

Please consult with your institution for guidance as to costs when you prepare your application. Please note that you do not need to provide approval of costing through your internal system at this stage, but it will be requested from shortlisted applicants

Duration

- Funding will be awarded for an initial year. Funding for a second year will depend upon the findings of the first year.
- At the end of the first year, all involved parties will meet to decide on the continuation of the project.
- Projects must start from Apr 2023

Terms and conditions

- This funding is flowed down from our partnership with Accenture.
- IP to be made available under Creative Commons or open-source license which permits commercial use.
- Turing is committed to sharing algorithms and methods publicly.
- Projects will be expected to report on a quarterly basis.

- Projects will be expected to engage with the Turing, KI and with Accenture on a regular basis.
- Additional terms and conditions may apply.

Further Reading

Previous work Generally work in this area has been sparse. The closest example has been carried out at Cass Business school, who have looked to use agent based modelling to better understand:

- Underwriting cycles in the Property insurance industry [1]
- Underwriting cycles in the Auto Insurance industry [2]

Other work has been carried out on similar threads, if not directly geared towards understand the Underwriting Cycle, such as:

- Simulation of cat exposed insurance [4] which talks about systemic risk introduced in the industry as a result of a limited selection of cat modelling tools available in the market. An extension of this work might be especially interesting to Lloyd's.

Appendix

Academic papers in related fields:

- 1. Time Series Data Mining with an Application to the Measurement of Underwriting Cycles https://openaccess.city.ac.uk/id/eprint/21222/ (2019)
- 2. An agent-based system with temporal data mining for monitoring financial stability on insurance markets (2019) https://openaccess.city.ac.uk/id/eprint/21275/
- 3. The Insurance Industry as a Complex Social System: Competition, Cycles and Crises (2018) https://www.jasss.org/21/4/2/2.pdf
- 4. Simulation of the Specialty Insurance Market (2021) https://www.researchgate.net/publication/350020171_A_simulation_of_the_insurance_industry_the_problem_of_risk_model_
- PhD (City) thesis on Application of Agent Based Modeling to Insurance Cycles. The author of this work co-authored a number of the papers listed above. https://openaccess.city.ac.uk/id/eprint/12195/1/Application
- Agent Based Modelling in Python [ABCE]
- Repo; https://github.com/AB-CE/abce
- Book chapter: https://link.springer.com/chapter/10.1007/978-3-319-67217-5_2 This is behind a subscription (conference paper below)
- Conference paper: https://www.researchgate.net/publication/319451918_ABCE_A_Python_Library_for_Economic_AgentBased_Modeling/link/5a252f58aca2727dd87e883f/downloa

The Alan Turing Institute

Application process

Any queries regarding process, post-award requirements, costing or general eligibility should be discussed with the Research Project Manager Tony Zemaitis (FinanceandEconomicsProgramme@turing.ac.uk)

Successful proposals will be funded through an award from the Turing.

The process summary is as follows:

- Online form completed by applicants and submitted online via Flexigrant
- First stage – initial review and eligibility check
- Second stage – applicants that pass stage 1 sent through to review by panel
- Shortlisted projects asked to prepare detailed project proposals
- Presentation to shortlisting panel with Accenture and KI attendees
- Panel reviews applicants based on fit and assessment criteria
- Successful applicants notified by Research Project Manager

Summary of stages

October	November	December	January	Apr
Expression of Interest (EoI) live.	Deadline for EoI submission.	Shortlisting by panel and applicants notified. Deadline for detailed project proposal and letters of support from shortlisted applicants.	Presentation to shortlisting panel and Accenture attendees. Final decision. Contracting and project set-up begins.	Project to begin

How to apply

Applications should be completed and submitted by Wednesday 9th November midday to **the Turing's FlexiGrant portal**. If you have not already done so, all applicants must first register on the system and provide basic details to create a profile.

Questions

If you have any questions, please email Tony Zemaitis, Finance and Economics Research Project Manager on tzemaitis@turing.ac.uk