

2024-25 HIVE Summer Internship Project

Imagining Global Futures: Using AI for socio-political prediction and visualisation

33HUM_MCASI_SocioPoliticalPredictor

Primary Academic Supervisor

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Project Background

This project has developed out of discussions between Faculty of Humanities leadership (PVC) and the Dean Global Futures. The Global Futures platform seeks to build students with a strong global orientation, aware of their place in a complex global environment, and with skills to step up to whatever the future might hold. It also supports research relevant to understanding and solving global challenges, whether these be in international relations, social policy, design, sustainability, communications, and more. The platform also engages with government and industry to ensure academic activities are relevant and useful. In this complex, globalising world, AI potentially offers an opportunity to forecast the effects of particular social, political, economic, technological, and cultural policies. The HIVE has the technology to build virtual environments in which those possible effects can be visualised. This ‘proof of concept’ project is an opportunity to develop a prototype of a social impact forecasting/predictive tool. Once refined, the tool could ultimately be used to make projections of possible future scenarios, including VR visualisations, and policy makers could then modify policies to achieve more positive outcomes. This could evolve into a (commercially viable) Global Futures Simulation Lab

Project Description, Expected Outputs, Possible Stretch Goals

Project description - This is a proof of concept, exploratory study to identify potential (and eliminate unfeasible) options for building a global futures predictor. It has 2 phases:

1. identify a mechanism for prediction/forecasting (using AI)
2. identify appropriate (and eliminate inappropriate) visualisation software to image the forecast. The intern will begin with a relatively discrete question, such as ‘what would happen to global movements of

people if all national border restrictions were removed'. (CHATGPT provides an adequate response of effects inc. benefits, challenges, and implications for urbanisation and new forms of international cooperation and regulation; or 'what will happen if Kamala Harris wins the US Presidential election'; or 'what would happen if the US claimed the South China Sea?'; or 'what will be the effects of international student caps in Australia?' (again CHAPTGPT offers useful responses). The challenge will be to identify enough detail in the question, and in source data, to generate more than just generic responses, and to refine parameters to be covered. The second will be to identify appropriate visualisation tools – currently VR is likely too complex and only relevant for some questions. A range of tools could be used in a final product. This project would identify one that works for the question selected eg the migration question could produce a world map/globe of movements against a timescale (see religion one in reading).

Expected Outputs:

1. A report on what can and can't be done, and what will and won't work technologically
2. Parameters for question setting; and for data inclusions/source AI
3. A simple visualization of the socio-political forecast

Possible Stretch Goals:

1. Exploration of inclusion of psychological modelling in decision making and forecasting
2. Exploration of inclusion of dialogue between AI to refine forecasting

Links to background reading and any relevant recent work in the field

There does not appear to be much academic work in this area. Most AI forecasting or modelling is financial/economic, or straight science eg weather modelling. Intern could start with (links don't seem to copy on this portal) Anything from Technological Forecasting and Social Change | Journal | ScienceDirect.com by Elsevier Eg this one provides an overview of topics in the journal re AI and forecasting and notes some social forecasting topics - Evolution of artificial intelligence research in Technological Forecasting and Social Change: Research topics, trends, and future directions - ScienceDirect Eg Breaking the trend: Anomaly detection models for early warning of socio-political unrest - ScienceDirect Eg On the forecasting of the challenging world future scenarios - ScienceDirect Eg Modeling the effects of artificial intelligence (AI)-based

innovation on sustainable development goals (SDGs): Applying a system dynamics perspective in a cross-country setting - ScienceDirect Also Journal of futures Studies Homepage * Journal of Futures Studies (jfsdigital.org) Take a look at Animated map shows how religion spread around the world (youtube.com) (a simple example of mapping) Research | ADM+S (admscentre.org.au) QUT's automated decision making and society Arc Centre of Excellence. Applying AI for social good | McKinsey AI for Good: Solving World Problems with Artificial Intelligence - Just Think AI Use of social media to predict migration after conflict Using Social Media to Monitor Conflict-Related Migration: A Review of Implications for AI Forecasting-Web of Science Core Collection

What type of visualisation will the student develop or produce?

Depends on question asked and options available. The tool will be developed that can envision possible futures based on parameters set by policy decisions on a range of facets of social life. AI will generate text answers to future oriented questions eg migration question represented in movements on a global map); South China Sea question similarly, inc. likely maritime defence responses. An immersive model would allow user to change parameters to create different outcomes.

How will the visualisation contribute to your research outcomes?

Enhance user-friendliness and immediacy of the technology (ultimately a VR option would generate an emotional response which might trigger behaviour change; and an option allowing modification of parameters would encourage individual and policy level agency to change outcomes in positive directions). Attempts at visual application will demonstrate whether/how this idea is viable, and identify major difficulties in enacting it.

If the project is successful, where would you consider publishing the results?

In an international sociological journal such as Current Sociology; the journal Futures or Journal of Futures Studies, or Technological Forecasting and Social Change; as well as journals of technology, based on advice from HIVE

Draft Project Timeline:

Week 1

Nov 11 - Full day HIVE induction Nov 12 - Area and Project Induction with Primary supervisor Nov 13-15 - Literature and relevant project review Nov 15 - Develop project plan with HIVE and academic team Begin diary of work, feedback, observations etc

Week 2

Nov 18 - Basic training by HIVE staff on tools and technologies used in the project (e.g., data visualization libraries, programming languages). Nov 19-20 – Identify parameters of project, particularly limitations to the types of questions that can be ask

Week 3

Milestone 1 - Final decision on most appropriate question to pursue, and most appropriate AI tool. Explore appropriate visualisation options Draft initial design documents and project plans, including rationale and outline of excluded options Deep dive into the specific visualization libraries or frameworks that will be used Present proposal and rationale to HIVE team and supervisor for feedback. Continue diary and reading

Week 4

Create a simple prototype or proof of concept based on the design documents. Begin developing core features of the visualization tool as outlined in the project plan. Work on integrating data sources with the tool and refine data integration and manipulation. Present the prototype to HIVE team and supervisor for feedback Review progress with supervisors, discuss challenges, and plan next steps. Continue diary and reading

Week 5

Continue developing and refining advanced features of the visualization tool. Focus on user interface design and ensuring a user-friendly experience. Begin initial testing of features to identify and fix bugs Continue diary and reading

Week 6

Milestone 2 - Release a version of the tool to a select group of users (internal team, no need for Ethics) for testing. Gather and analyze user feedback to identify areas for improvement. Make necessary adjustments based on feedback and testing results. C

Week 7

Performance Optimization: Work on optimizing the performance of the tool (e.g., load times, responsiveness). Refine Features: Implement any additional features or enhancements based on ongoing feedback. Documentation: Begin creating documentation for the

Week 8

Final advice from expert supervisory panel

Week 9

Focus on report writing and presentation preparation Milestone 3 - Provide a draft report and presentation to supervisory panel

Week 10

As above, incorporating feedback and finalizing product. Milestone 4 - 31st Jan Final Presentation Showcase Day and final report due

Student Experience and Supervision:

How often will you meet with the student over the 10-week period?

1-4 times per week, with primary supervisor, depending on project stage and need. Note that the 3 additional co-supervisors are advisors who will be available for brainstorming and technical assistance.

Your work desk location and the location of student desk

209.level 3 RA hub. Supervisor is in 209.314, just down the hall.

Student Attributes:

Please indicate any preference for student's academic discipline or field of study

Computer Science and Maths It would be lovely to have two – one with a design or social science background and one with comp science. But comp sci is most important.

What competencies are required to start this project

Intermediate - 2D image and/or video software (e.g. Adobe Suite, Sony Vegas)

Intermediate - 3D modelling software (e.g. Blender, 3ds Max)

Intermediate - Unity Programming (C# coding, animation syntax, debugging, problem-solving)

Beginner - ChatGPT, Large Language Models

Do you have any other student attributes you think are important to the project?

Creative, logical, technologically competent (computer science, maths), interested in socio-political issues, interest in user-friendly design.