

MSC PROJECT PROPOSAL

IMPERIAL COLLEGE LONDON

COMPUTATIONAL METHODS IN ECOLOGY AND EVOLUTION

Placing UK Research within the International STEM Funding Landscape

Author:
Xuan Wang

Leading Supervisor:
Dr. Samraat S. Pawar

Other Supervisor:
W. D. Pearse

April 25, 2023

Placing UK Research within the International STEM Funding Landscape

April 25, 2023

1 Introduction and Proposed Questions

The funding strategy for STEM discipline differs among countries, leading to differences in their development and contribution to the world. Nevertheless, it is not uncommon that bias sometimes affects the distribution of research funding [Crudden (2022)]. Therefore, studying the base of bias in research funding could be beneficial to understand the current research funding distribution and gaining a more objective result.

In my project, we aim to find the answer to the question: *Is there any bias within the international STEM funding landscape?* In particular, this question will be answered from the following aspects:

- *Are the research councils funding all the fields equally?*

Research councils usually claim that they have funded the projects equally, and therefore the first thing to study is the fairness of the research funding. Our project will study whether the funding is spread equally across all the available research fields in the UK.

- *If not, which are the most and the least funded research fields?*

If the result of the last question reveals a negative result indicating an unequal distribution across the research fields, it will then be considered which research area is getting more funding and which is getting less.

- *What are the potential causes of the biases?*

There are several common risks in research funding, such as gender bias, risk aversion bias, racial bias, etc [Wojick & Michaels (2015)]. Due to financial constraints, the “risk” of a proposal is usually a critical point in whether the project will be funded [Franzoni et al. (2022)]; The funding gap between different genders and races or ethnicities have also been proved by the research of Romy Lee & Naomi Ellemers [Van der Lee & Ellemers (2015)] and that of Konkel [Konkel (2015)]. Our report will examine which type of bias is causing inequality in the research funding landscape.

2 Methodology

Fine-scale data will be used for our project. Mallet will be applied for the Machine Learning procedure. Our report will use data from the UK Research and Innovation (UKRI).

We will apply pre-processing to the raw data, and the clean fine-scale data will be used for the analysis. HPC could be employed if the data is too big; the results from different countries will be compared for the final analysis.

3 Anticipated outputs and outcomes

- The bias in research funding in a set of countries will be displayed concerning countries respectively;
- For each type of bias, the result for different countries will be taken into comparison, and the difference in the results of developed and developing countries will also be studied;
- Analysis will be conducted regarding the potential reason and consequence of the biases.

4 Project Feasibility

The timeline for this project is displayed as follows:

The writing will be covered throughout most of the time. The aim is to complete the first write-up by early August, and then modify it for the rest of the weeks.

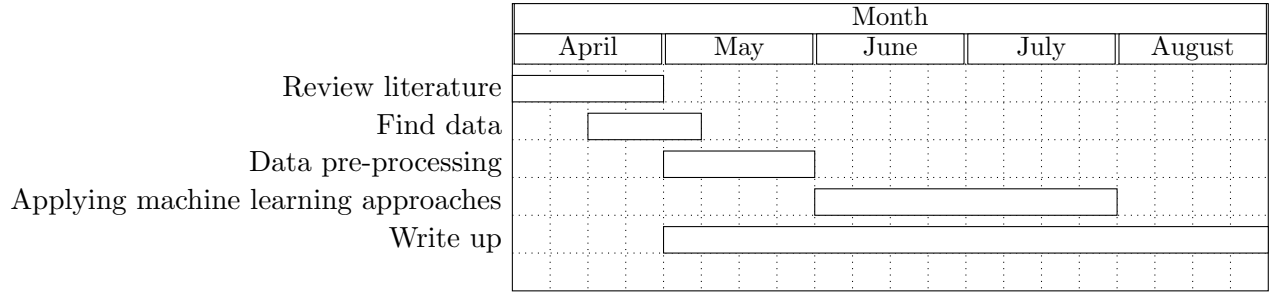


Figure 1: Gantt Chart

References

- Crudden, C. M. (2022), ‘Gender equity in funding’, *Nature Reviews Chemistry* **6**(4), 233–234.
- Franzoni, C., Stephan, P. & Veugelers, R. (2022), ‘Funding risky research’, *Entrepreneurship and Innovation Policy and the Economy* **1**(1), 103–133.
- Konkel, L. (2015), ‘Racial and ethnic disparities in research studies: the challenge of creating more diverse cohorts’.
- Severin, A. & Egger, M. (2021), ‘Research on research funding: an imperative for science and society’.
- Van der Lee, R. & Ellemers, N. (2015), ‘Gender contributes to personal research funding success in the netherlands’, *Proceedings of the National Academy of Sciences* **112**(40), 12349–12353.
- Wojick, D. E. & Michaels, P. J. (2015), ‘Is the government buying science or support? a framework analysis of federal funding-induced biases’, *Washington DC, Cato Institute, Cato Working Paper* (29).