

# **Research Proposal for “Research on Research on Research: Analyzing historical trends in statistical and computational research from 1993 to 2024”**

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## **Abstract**

This paper aims to analyze the changes in research paper output for different statistical and computational fields over the time period from 1993 to 2024. The research papers used for this analysis are sourced from a dataset of papers from the pre-print journal arXiv.

# 1 Introduction

In recent years, with the fields of artificial intelligence and machine learning becoming important parts of the public lexicon and increasingly becoming involved in our day to day lives, we've seen firsthand large changes in statistical and computational research. With statistical methods increasingly becoming intertwined with computational principles, such as its integration with aspects of computer science, the future of statistics and computation appear to be one and the same. How does this current research landscape compare with that of the landscape a mere 30 years ago? This paper aims to analyze historical trends in statistical and computational research, as tracked by papers submitted to the online pre-print journal arXiv, in order to visualize the dramatic changes we've seen over the years and find any subfields growing in the present that could yet transform the landscape of the future. This analysis of historical trends will be conducted using a specific dataset available on Kaggle [Mishra \(2025\)](#).

## 2 Research Questions

- What statistical and computational fields have seen the largest increase in publications?
- How have the most published statistical and computational fields changed over time?
- What statistical and computational fields are projected to grow the most in the coming years?

### 3 Literature Review

Looking at themes in statistical and computational research is nothing new. For instance, [Gelman & Vehtari \(2021\)](#) analyzed the dominant statistical ideas of the past 50 years, suggesting inferential methods, computational algorithms, and data analysis have been the most impactful in the shifting of the research landscape. Smaller subsets of time have also been analyzed, with [Jun et al. \(2018\)](#) using Google Trends to track the growth of different subfields of research (with an emphasis on big data and application). This paper aims to look at a similar problem with a different lens, using publication outputs themselves as a way of analyzing changes in research focus and interest. In doing this, the paper aims to also obtain an indication of the subfields with increasing research interest in the short term that may lend itself to future publications. Evaluating the research trends of the future has often involved modeling itself, such as the hype cycle model [Dedehayir & Steinert \(2016\)](#). This model aims to track the life cycle of technological innovations. In a similar vein, this paper aims to use current and recent paper production output to indicate trends of the near future. As the methodology involves using the research paper pre-prints themselves, it may provide a clearer picture of specific publication interests and trends rather than topics and concepts in general.

## 4 Methods

### 4.1 Data Parti

## References

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Jun, S.-P., Yoo, H. S. & Choi, S. (2018), ‘Ten years of research change using google trends: From the perspective of big data utilizations and applications’, *Technological Forecasting and Social Change* **130**, 69–87.

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**URL:** <https://www.kaggle.com/datasets/sumitm004/arxiv-scientific-research-papers-dataset>