Evolution of rumour studies, which discipline most likely to be sitting atop the iron throne?

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INTRODUCTION

The phenomenon of rumour has been with human beings since their genesis. It has been manifested in a wide range of cultural elements including fictions, songs, paintings to name but a few. Over the years, the introduction of different types of media especially emergence and rise of different variations of online social networks took rumour to a different level and had a massive impact on its influential power. To understand the behaviour of such a complex social phenomenon, researchers from different disciplines are working since almost 120 years ago, however; there is no big picture that shows the evolution of their research through these years. But now network science has provided us with an opportunity to make this picture and study the characteristics of this field in macro level. Such a picture will assist academia to realise the significance of this field as an independent interdisciplinary research field. Also, the evolution of contributing disciplines through the time portrays the dynamic of the field and future contributing disciplines. To this end, in this poster, we use three-level analysis over the bibliometric data obtained from Web of Science. In the first level, we study the structure of rumour research by statistical analysis. To do that we look at the dynamic of the number of papers, the number of contributing discipline and depth of interdisciplinary collaboration since 1900. In the second level, we study the internal evolution of the field with community detection algorithms We explain how this field has been changed over the years, regarding the contributing disciplines. In the last part, we go one more level deeper and explore topic evolution in this field using Latent Dirichlet Allocation (LDA) model.

THREE-STAGED ANALYSIS

STATISTICAL ANALYSIS OVER THE FIELD

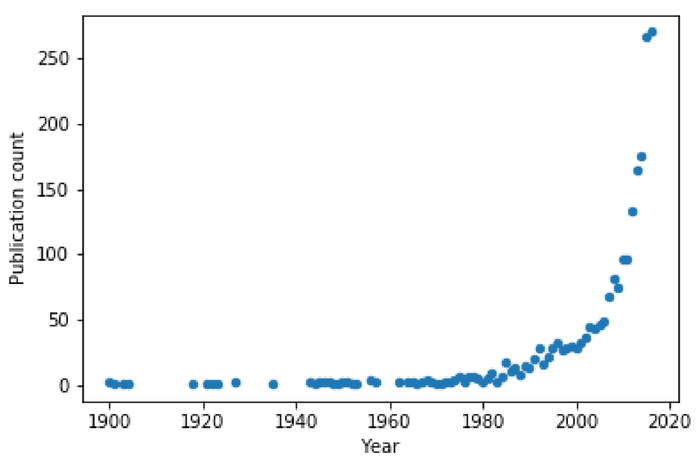


Figure 1: Growth of publications in the field of rumour studies. As the diagram shows, the number of publications is growing exponentially. This dramatic growth which started in 1980s and reached to the highest rate in the last decade, indicates an unprecedented interest to this field from reseacrhers in the last three decades.

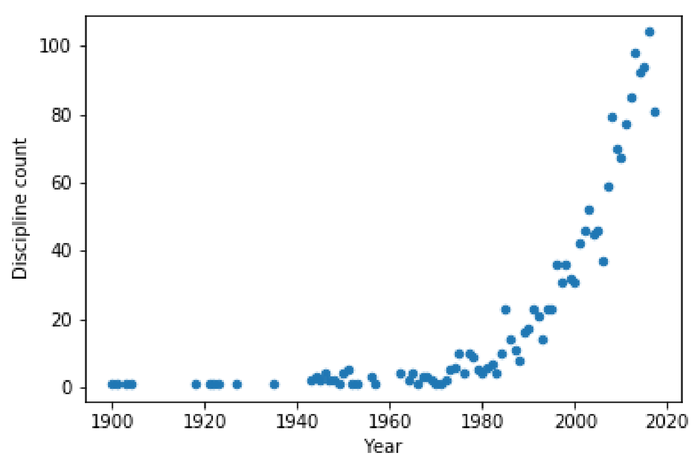


Figure 2: Growth of underpinning disciplines in the field of rumour studies. As the diagram shows the number of underpinning disciplines is growing exponentially. This dramatic growth which started in 1980s and continued with almost the same rate, shows an increase in the level of multidisciplinarity and interest to this field.

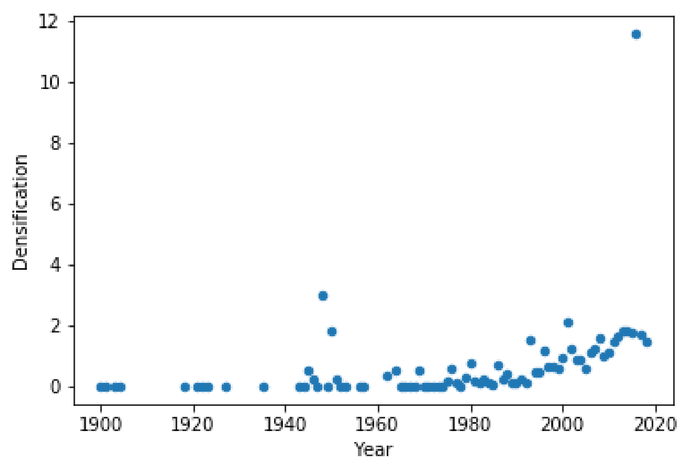


Figure 3: Growth of densification rate in co-authorship network in the field of rumour studies. As the diagram shows the densification ratio is gradually increasing which shows growth of collaboration in author level. It can also be a signal that indicates formation of community around this field.

INTERNAL EVOLUTION OF THE FIELD

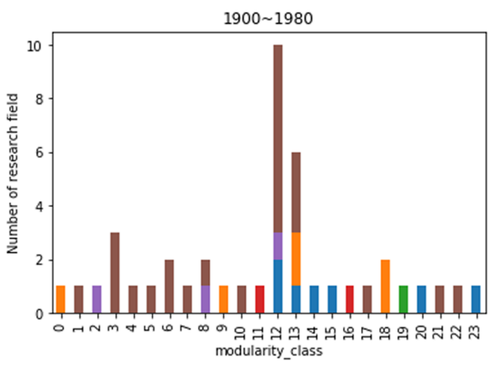


Figure 4

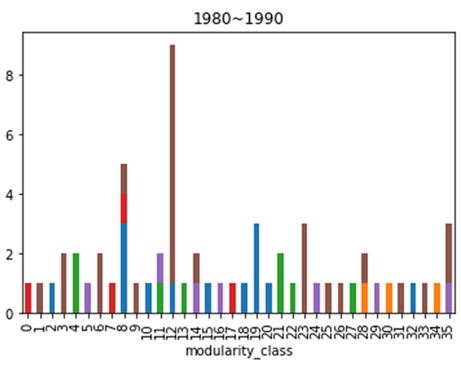


Figure 5

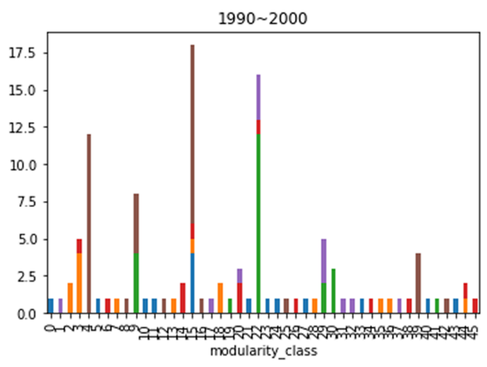


Figure 6

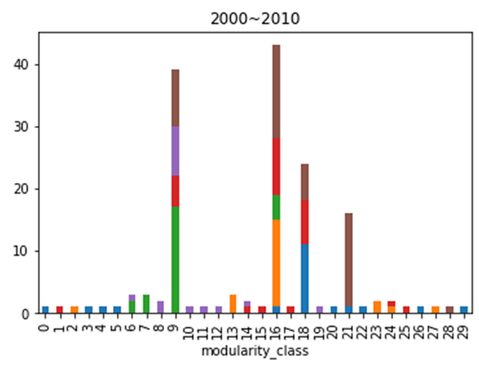


Figure 7

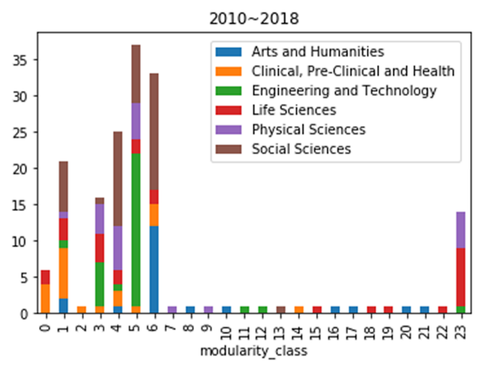


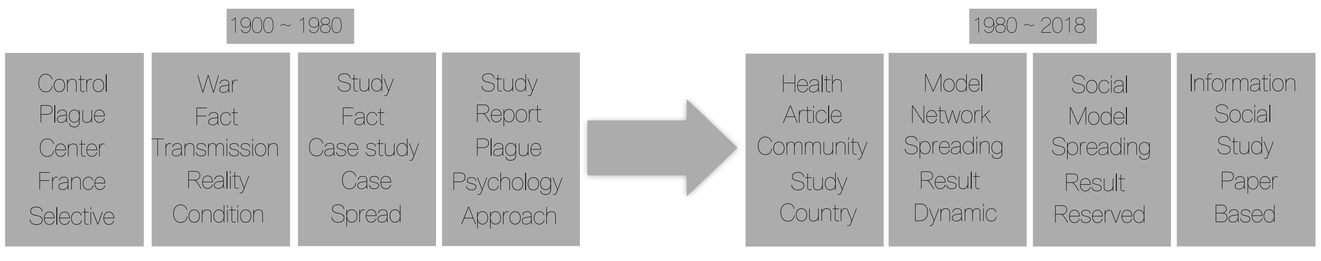
Figure 8

In this part, first we make the underpinning disciplines network, then we apply community detection algorithm. After that, to be able to get an apprehensible picture of field evolution, we grouped the categories in each community into six major disciplines (Figure 4-8). As the figures show the communities are heavily entangled to each other. To make the interpretation of the figures easier, for each time period, we picked the major communities, then for each community we determined those disciplines that consist more than 80% of that community, then to what degree those disciplines are repeated in different time periods. As the table 1 shows in total, 11 different combination forms exist in the identified communities. Among them, three groups have more chance to play a role in future of this field: (i) Engineering & technology, physical sciences and social sciences (ii) Clinical, pre-Clinical and health, life sciences and social sciences (both these groups appeared in last two time periods), and (iii) Art and humanities and social sciences (except one time period this group appeared in all past periods).

Table 1

Arts and Humanities	Clinical, Pre-Clinical and Health	Engineering and Technology	Life Sciences	Physical Sciences	Social Sciences	1900~1980	1980~1990	1990~2000	2000~2010	2010~2018
										Single Presence
										Double Presence
										Tripple Presence
										Quadruple Presence

TOPIC MODELLING OVER THE FIELD



In this part, using Latent Dirichlet Allocation (LDA) algorithm, we did topic modelling on the rumour studies publications in two periods: (i) 1900 ~ 1980 and (ii) 1980 ~ 2018. But before applying the algorithm we did a comprehensive pre-processing including removing the stopwords, lemmatization and detection of the phrases. The first period topics are mostly related to crises such as war, epidemics and natural disasters which refer to the early stage of rumour research. The second set of topics are mostly relevant to modelling, information and social networks which are the current theme of research on rumour. Our topic modelling indicates a transition in rumour research from rumour in crisis context to rumour in social networks.

CONCLUSION AND FUTURE RESEARCH

Rumour studies is a growing field which is drawing attentions from wide range of disciplines. By retrospective analysis over bibliometrics data the future of this field will probably be in the hands of (i) Engineering & technology, physical sciences and social sciences or (ii) Clinical, pre-Clinical and health, life sciences and social sciences, or (iii) Art and humanities and social sciences. Also, the topics of this field will probably related to the area of social networks and modelling. This analysis can be improved in several areas, most notably, the other variations of rumour like gossip, misinformation and fake-news can be analysed to get a more realistic picture of the whole field of unverified information.

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