How does Western science fiction show different patterns of development over time

The goal of the project is to examine the evolution of Western Science Fiction over time and identify any patterns or trends in its development. This will involve analyzing the word frequency in a range of Science Fiction from different periods and using this analysis to draw conclusions about whether Science Fiction from different periods has textual relations and whether they have a preferred concept.

We used a dataset of Science Fiction (containing 10,000+ items) on Kaggle, and categorized these books by time period based on Prof. Wu Yan's categorization and selected the books with high ratings under that era for download. We downloaded 30 Science Fiction books, original in English or translated into English, in plain text from Project Gutenburg and other open sources for each period. The dataset includes 120 books. In terms of the concepts of Science Fiction, we used specific and precise literary terms from Trope.

Tools will be used in this project including *Voyant* for the interpretation of the most frequently used concepts and words in Science Fiction throughout time periods; and *Gephi* for the network analysis of Science Fiction from many eras and authors of different genders.

4 Stages of the Development of Western Science Fiction

Budding Period 1800–1900 → Golden Age 1930–1960 → New Wave 1960–1980 → Post New Wave 1980–present

References

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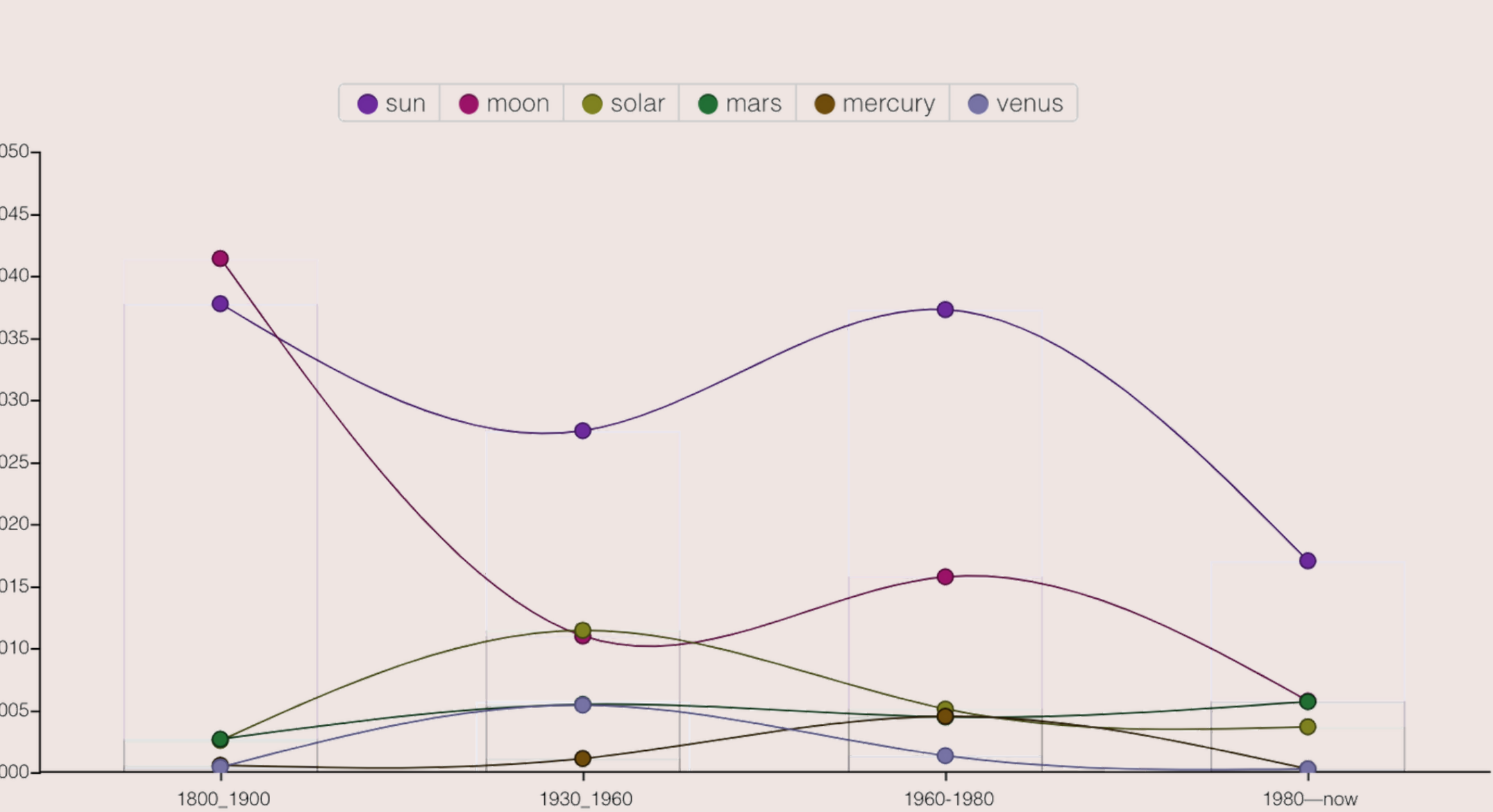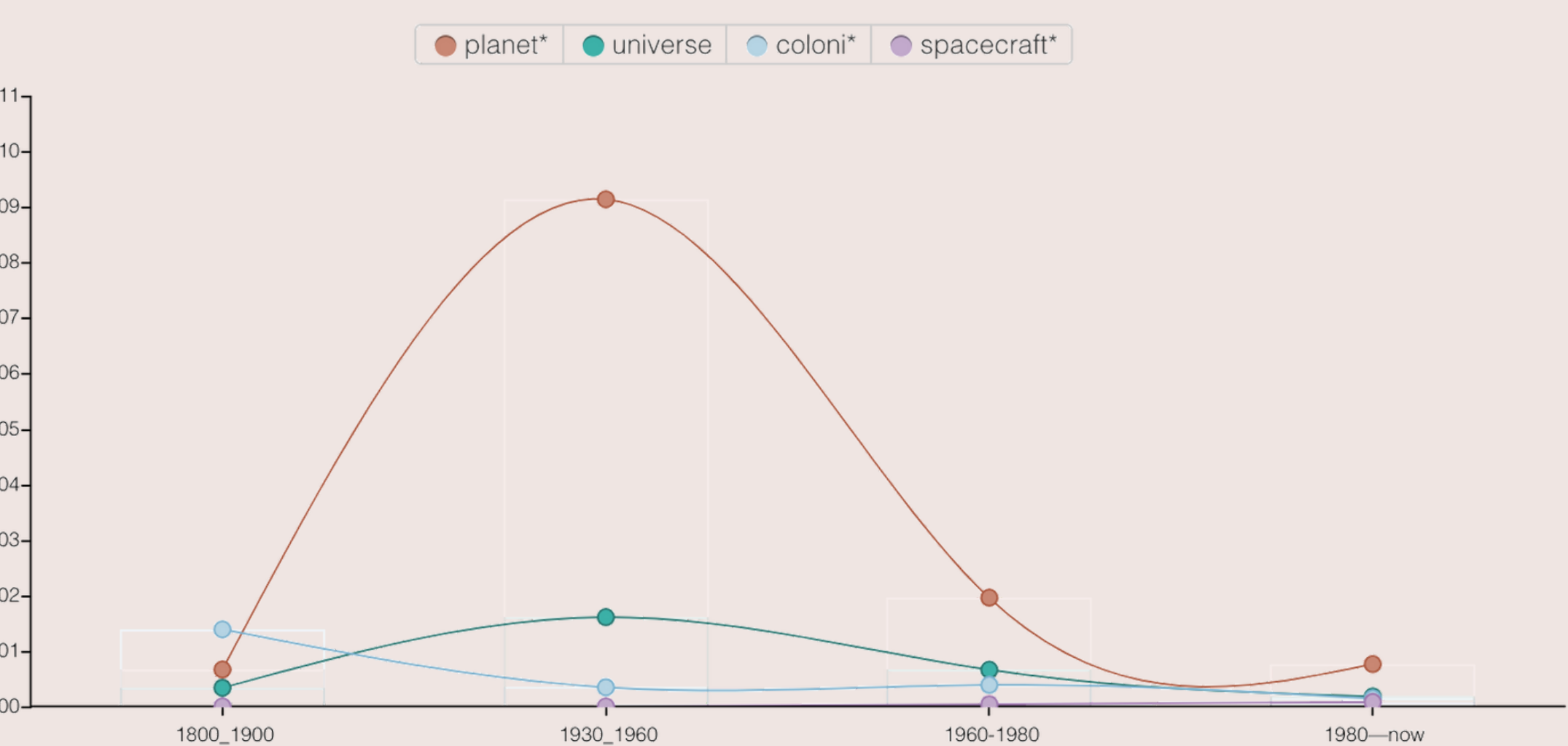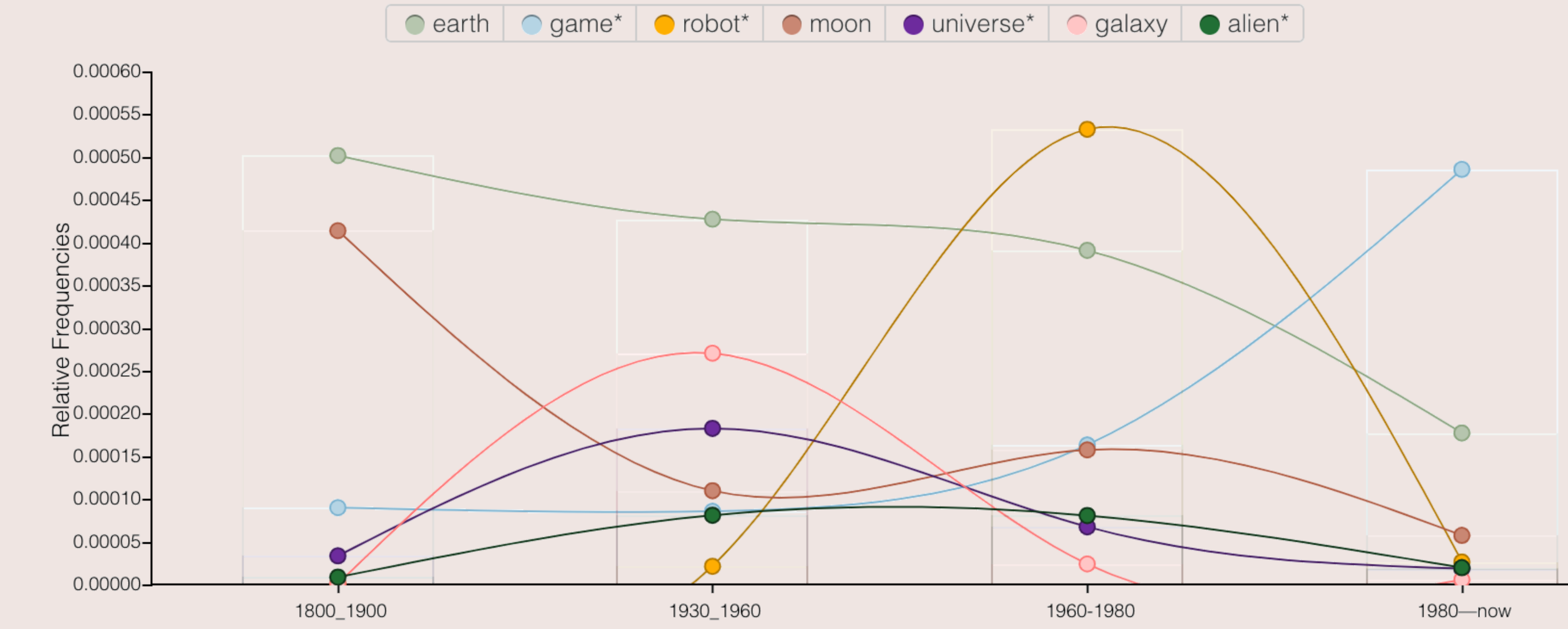Pledel, T. (2021, January 30). *Science fiction books (10,000+)*. Kaggle. Retrieved January 9, 2023, from https://www.kaggle.com/datasets/tanguypledel/science-fiction-books-subgenres

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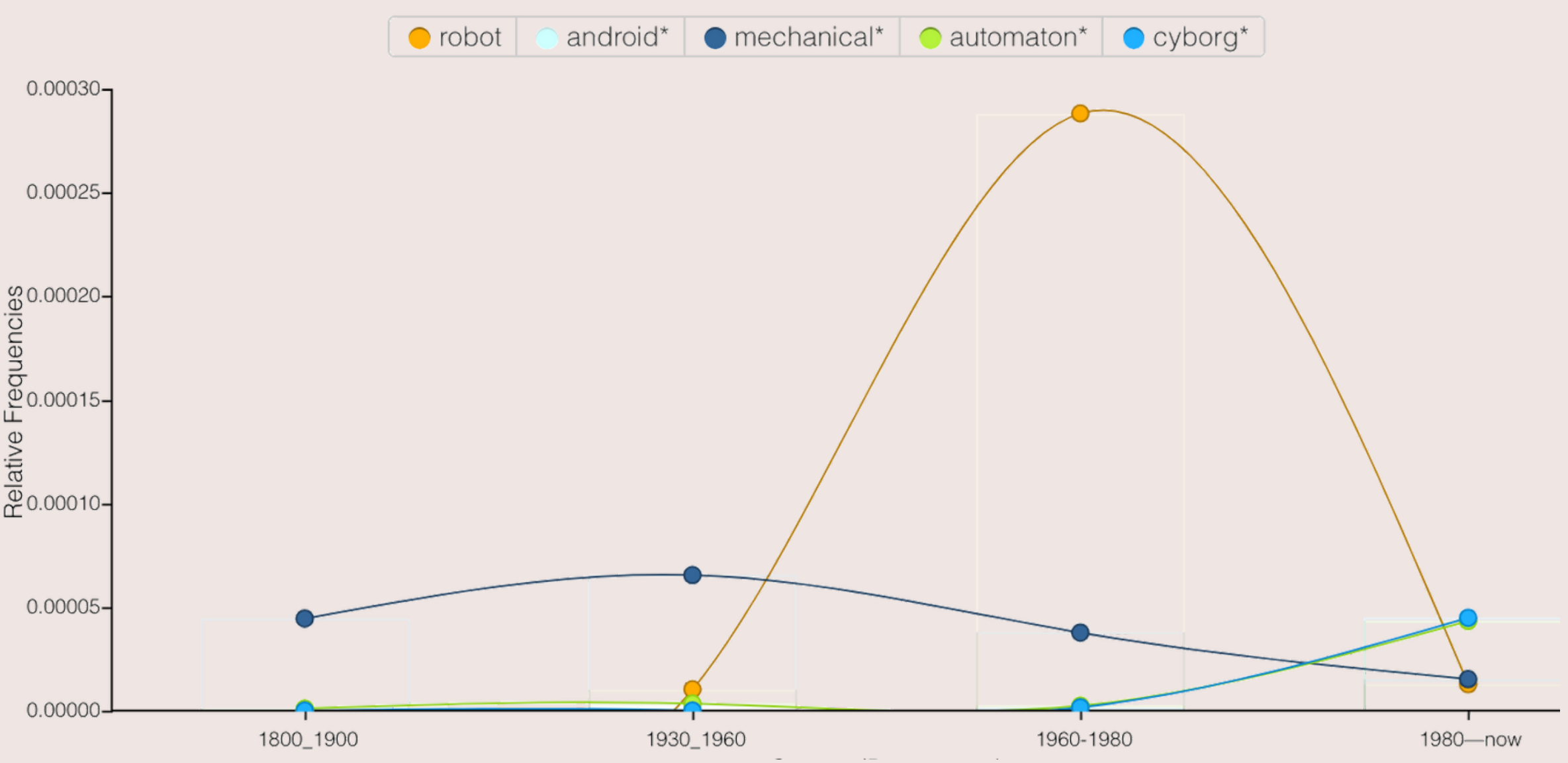
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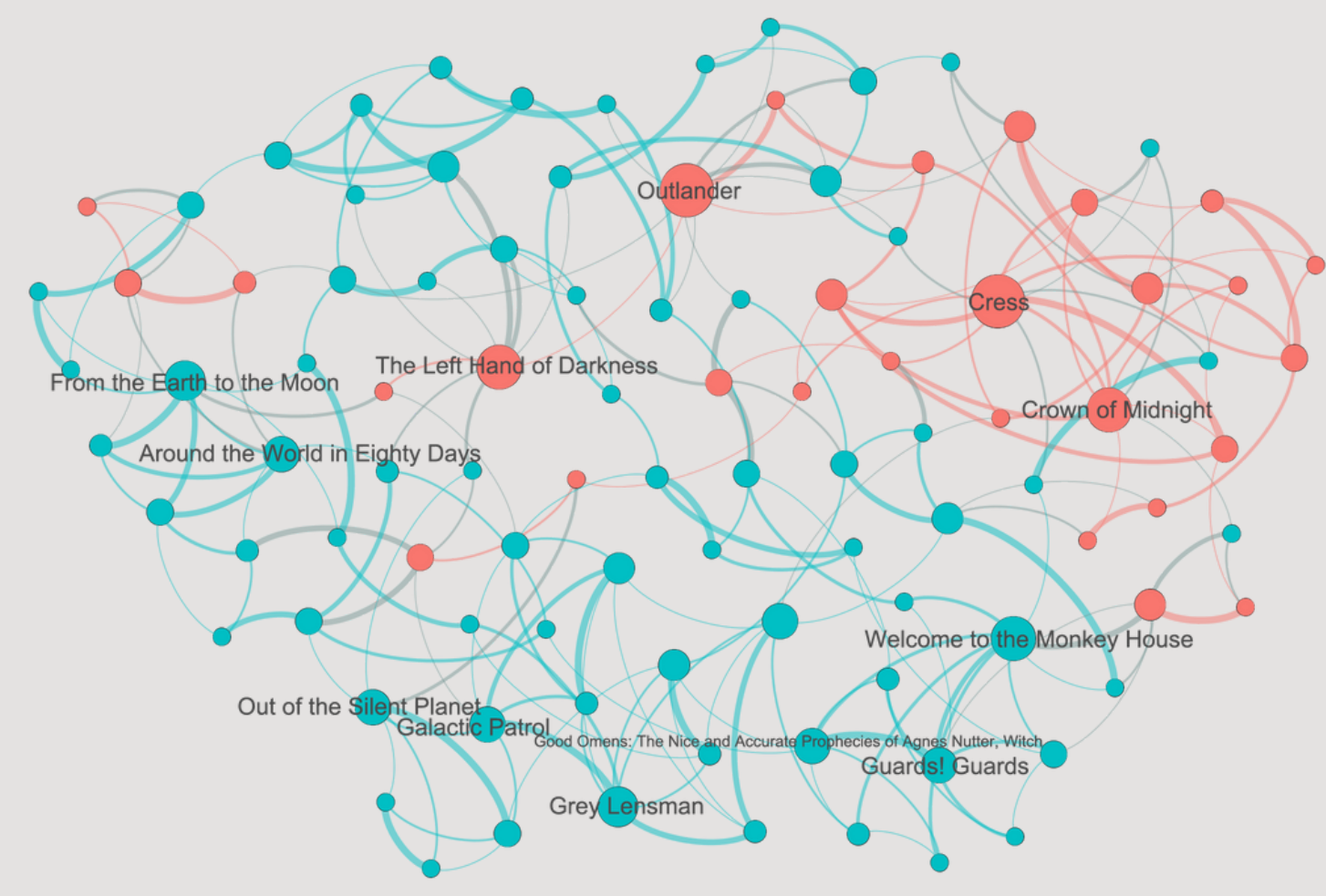
01 Topic Development

- Science fiction usually precedes the current state of human technology and can be seen as creative and prescient.
- Science fiction reflects the process of mankind in exploring the world.
- After the Industrial Revolution, mankind was not just satisfied with exploring the objective existence on Earth and turned to exploring the universe beyond Earth.
- The New Wave era 1960-1980 shows the human exploration of robots and AI.
- Humanity's ambition to explore the unknown is growing, from exploring the existing to exploring the unknown to creating rules.

- The most used word is "planet" and the frequency of "universe" was also the highest in 1930-1960.
- Frank Herbert's *Dune* was published in the 1960s. Isaac Asimov, Arthur Charles Clarke, and other great science fiction writers also completed many of their masterpieces during this period.
- "Colony" and its related words show an overall downward trend. The period 1800-1900 was a period of Western colonial expansion, which is also reflected in the books.
- Science fiction always refers more to the sun and moon. Among the other planet, Mars is mentioned more often. Many works depict humans as the first to go to Mars to try to colonize it.

- The rapid development of IT brought the concept of robots to appear more often in science fiction. Especially in 1960-1980, the New Wave era.
- Isaac Asimov's *Robot* series, published in the 1980s, laid the foundation for this type of science fiction.
- Cyborg refers to a human being who is transformed by a machine. It can be seen as a development of the concept of robotics and a product of the continuous development of technology.
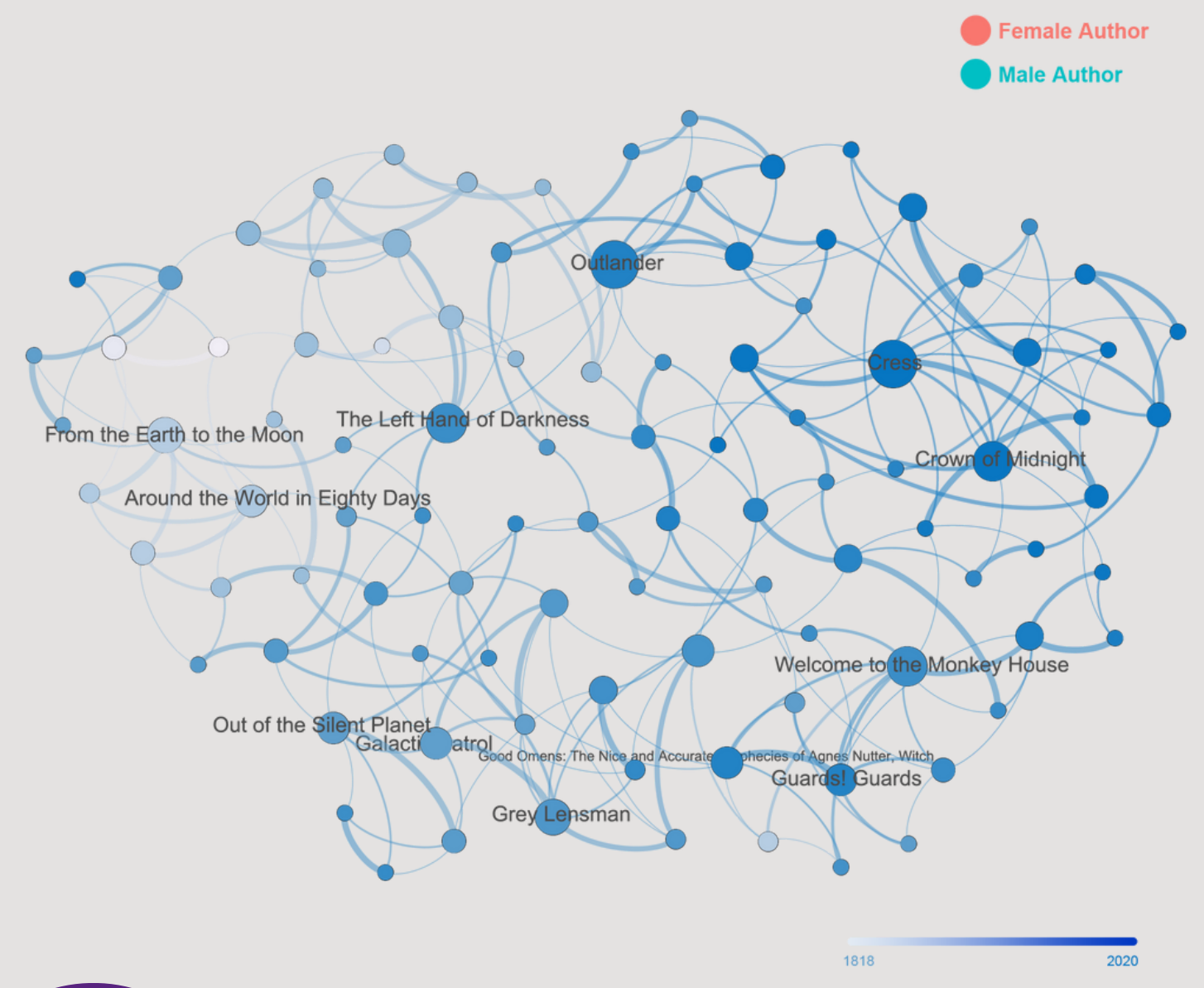
02 Network Analysis

Science fiction author gender distribution

- The information in the diagram illustrates how male and female authors interact with each other and calculate the similarity between books based on their word usage.
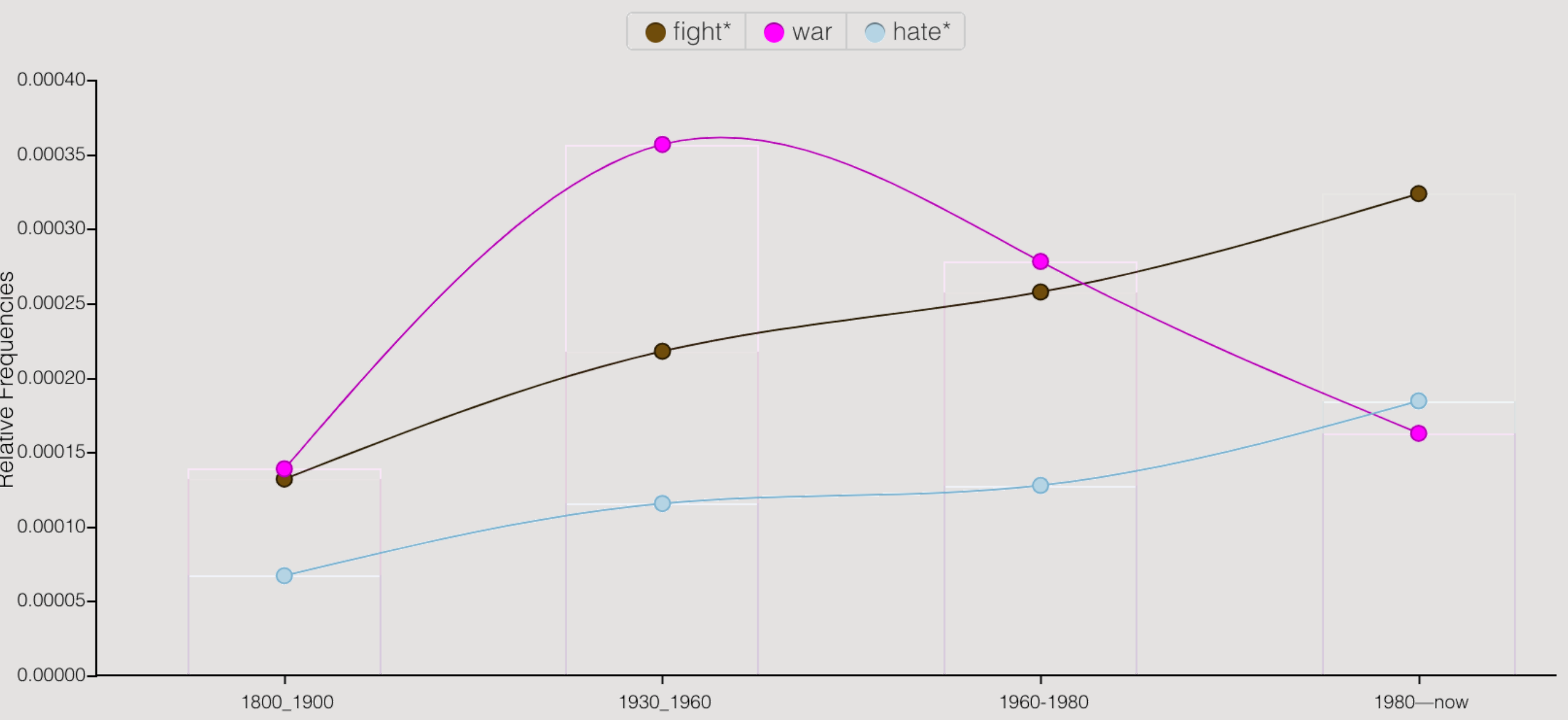- There is indeed a connection between the authors from the same gender.

Science fiction published year distribution

- The degree of similarities and associations between this science fiction has grown stronger over time, culminating in the period from 1980 to the present.
- We speculate that, with the development of science and technology, the unknown and speculation of early mankind are gradually being understood and verified.
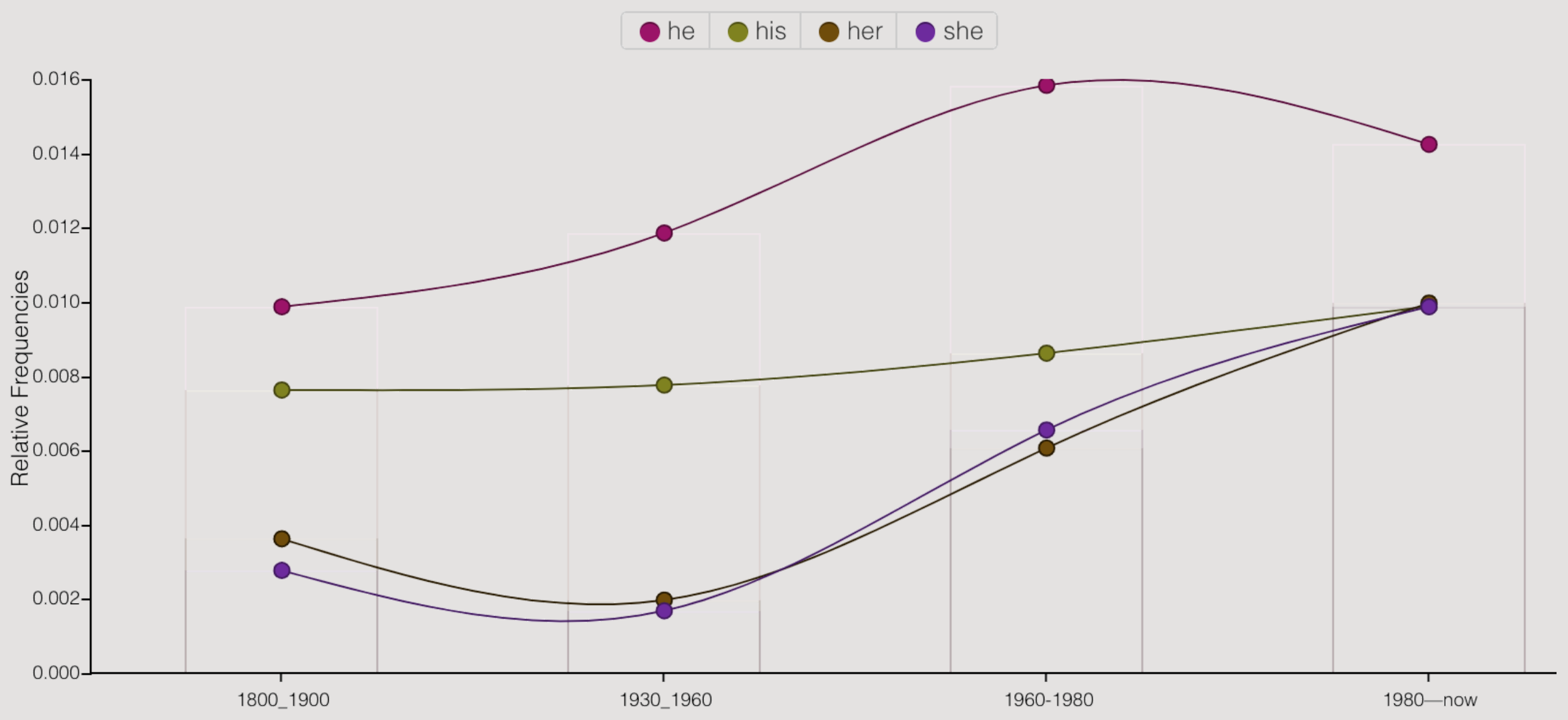
03 Negative/Fight Words

- Science fiction has a tendency to keep up with profound social issues and serves as a mirror of the real world, reflecting a world of increasing conflict and confrontation.
- More science fiction featuring war due to the two world wars and the word "war" reached its peak in 1930-1960. Both "fight" and "hate" share a very definite upward trend.
- Increasingly, science fiction is willing to construct collisions between society and its characters.

04 Pronoun Change

- A decline in the number of male characters in science fiction novels and films after the New Wave.
- The discrepancy between the frequency of female and male characters gradually diminishes.
- It may be linked to the feminist movement that has been going on since the 20th century.
- It might also be connected to the rise in the number of female science fiction writers.

05 Perceptual and Rational

- Writing styles vary on gender. Male writers tend to write in a rational and calm style, focusing on the external environment. Female writers are emotional and delicate, focusing on the emotions and the inner world of characters.
- The relative frequency of perceptual terms used by female writers is higher than that of male writers.
- In rational vocabulary, the frequency of the word "space" almost tripled for male writers compared to female writers.