The Evolution of the Idiolect over the Lifetime: A Quantitative and Qualitative Study of French 19th Century Literature

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The Evolution of the Idiolect over the Lifetime: A Quantitative and Qualitative Study of French 19th Century Literature

Abstract

We propose new methods to identify, quantify and describe the grammatical-stylistic changes that take place during the lifetime of an author. To examine the strength of the chronological signal of change, we first developed a method to calculate if a distance matrix of literary works contains a stronger chronological signal than expected by chance. 10 out of 11 corpora showed a higher than chance chronological signal. Second, we proposed a machine learning task: predicting the year in which a work was written. The accuracy and the amount of variance that is explained by the model were high for most authors we studied. After applying a feature selection algorithm, we examined the most important ones, i.e. patterns that have the greatest influence on idiolectal evolution.

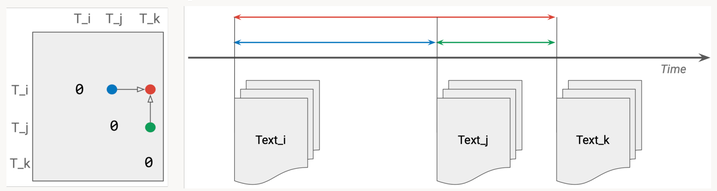
Corpus

CIDRE
Corpus for Idiolectal Research

- 37 million words
- > 400 books dated by year of writing
- 11 prolific French 19th Century Writers
- Download: `https://github.com/oseminck/cidre/tree/v2.0`

Robinsonian Score

- If there is a chronological signal, we expect that two books that are closer in time are more similar than two books further away in time.
- With stylo R, we calculated a distance matrix (δ) of the works of an author.
- We say that δ is Robinsonian if for any set of three distinct texts $text_i$, $text_j$ and $text_k$ such that $\text{date}(text_i) < \text{date}(text_j) < \text{date}(text_k)$, $\max(\delta(text_i, text_j), \delta(text_j, text_k)) \leq \delta(text_i, text_k)$.
- We calculate the rate of cells that are Robinsonian and the probability (P-value) that this rate is found by chance.
- A chronological evolution was found in 10 of the 11 corpora.

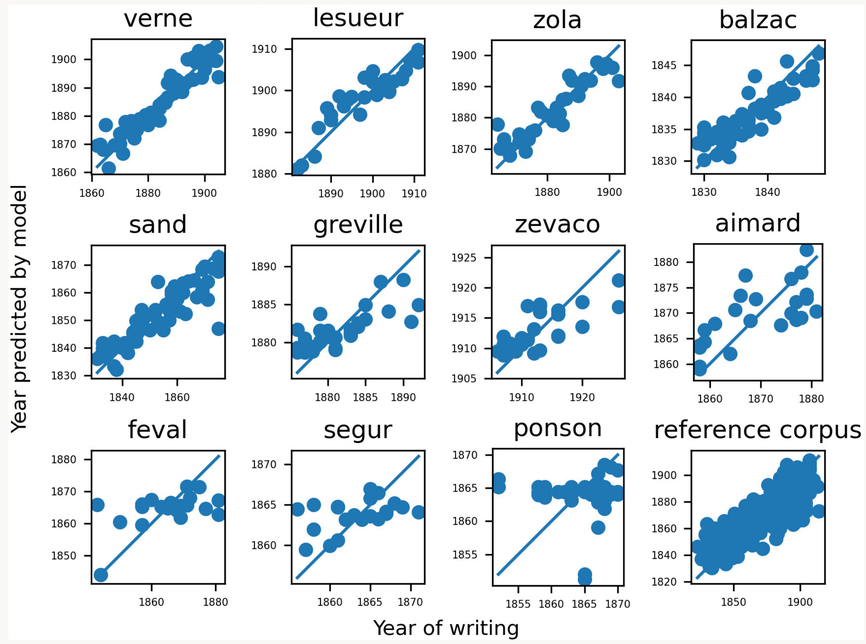


Author	Robinsonian Score	P-value
Comtesse de Ségur	0.38	0.14
Daniel Lesueur	0.41	0.00
Pierre-Alexis Ponson du Terrail	0.41	0.00
Gustave Aimard	0.42	0.01
Honoré de Balzac	0.44	0
Michel Zévaco	0.46	0
Jules Verne	0.47	0
George Sand	0.49	0
Paul Féval	0.49	0.00
Henry Gréville	0.62	0
Émile Zola	0.63	0
Reference Corpus	0.34	0

Table: Rates of number of Robinsonian cells

Predicting Year of Writing with Regression Models

- Goal: predict the year of writing of the books of an author.
- Regression model and feature selection using Lasso Lars, resulting in 10 to 61 stylistic/linguistic patterns per author.
- For example, the increasing pattern "…_DETPOSS_NC_…" in the work of Daniel-Lesueur:
  - Ah ! ma mère … ma mère … pensait Hervé, […]
    Ah ! my mother … my mother… thought Hervé, […]
  - Je suis perdue ! … Perdue ! … Ma chérie … Invente quelque chose ! … Ah ! I'm lost! … Lost! … My darling… Think of something! … Ah!
- Most models were successful.



Reference

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