

Analysis of ML Description Overlaps

Here I analyze a series of partial strings and overlapping phrases of syntactic overlap in sentences that show up in Professor Schellenberg's *Phil Studies* submission and my published papers "The Structure of Bias" (SoB) and "Algorithmic Bias" (AB).

First, Professor Schellenberg writes "There are **three basic** types of **machine learning programs**: **supervised learning, unsupervised learning, reinforcement learning**. For the sake of concreteness, I will **focus on supervised learning programs**", which I took to be non-accidentally similar to my passage "**Machine learning programs** come in **three basic** forms: **supervised learning, unsupervised learning, and reinforcement learning**. In what follows, I **focus on** the simpler case of **supervised learning programs**".

To see how much these two descriptions overlap with how "many authors present those same facts", I use the method recommended by Professor Schellenberg of using Google search results to indicate similarity with the literature more generally. I put the relevant strings into Google, grouping the key phrases through quotations and including an asterisk for the synonyms and pronouns (a method borrowed from S. Tomblin, "Investigating formulaic language as a marker of authorship" in *Proceedings of the International Association of Forensic Linguists' Tenth Biennial Conference*, 2012, p. 181-182):

Ex. 1: "machine learning programs" + "three basic" + "supervised learning programs"

The screenshot shows a Google search interface. The search bar contains the query: "machine learning programs" + "three basic" + "supervised learning program". Below the search bar, there are navigation options: All, Videos, Images, Books, News, and More. The search results show "About 2 results (0.67 seconds)". The first result is from <http://philsci-archive.pitt.edu> and is titled "Algorithmic Bias - PhilSci-Archive" by GM Johnson. The second result is from <https://www.gmjohnson.com> and is titled "Algorithmic Bias - Gabrielle M Johnson" by GM Johnson. Below the search results, there is a section for "Images for 'machine learning programs' + 'three basic'...". This section displays four images: a graph of Age vs. Dresses Femininely, a scatter plot of Dresses Femininely vs. Dresses Femininely, another scatter plot of Dresses Femininely vs. Dresses Femininely, and a graph of Width vs. Feedback. A "View all" button is located below the images.

As you can see from the screenshot (or from your own Googling of the same key phrases), there are just 2 results that come up, both of which are my work (different links to my "Algorithmic Bias" paper).

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Now compare when Professor Schellenberg writes “...classifies new data on the basis of its proximity to known classification in the feature space”, which I took to be non-accidentally similar to my passage “...classify new instances on the basis of their proximity in the feature space to known classifications.”

Ex. 2: “new * on the basis of * proximity” + “to known classifications” + “in the feature space”

Google

"new * on the basis of * proximity" + "to known classifications" + "in the feature sp X Q

All News Images Videos Shopping More Tools

About 3 results (0.42 seconds)

<https://www.gmjohanson.com/uploads/sob.pdf>

The Structure of Bias - Gabrielle M Johnson

by GM Johnson · Cited by 12 — One simple way to perform this task is to classify new instances on the basis of their proximity in the feature space to known classifications. F...

Images for "new * on the basis of * proximity" + "to kno..."

Dresses Femininely Age Wish Feedback

View all

<https://escholarship.org/content/...>

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One simple way to perform this task is to classify new instances on the basis of their proximity in the feature space to known classifications. For example,.

<https://escholarship.org/content/...>

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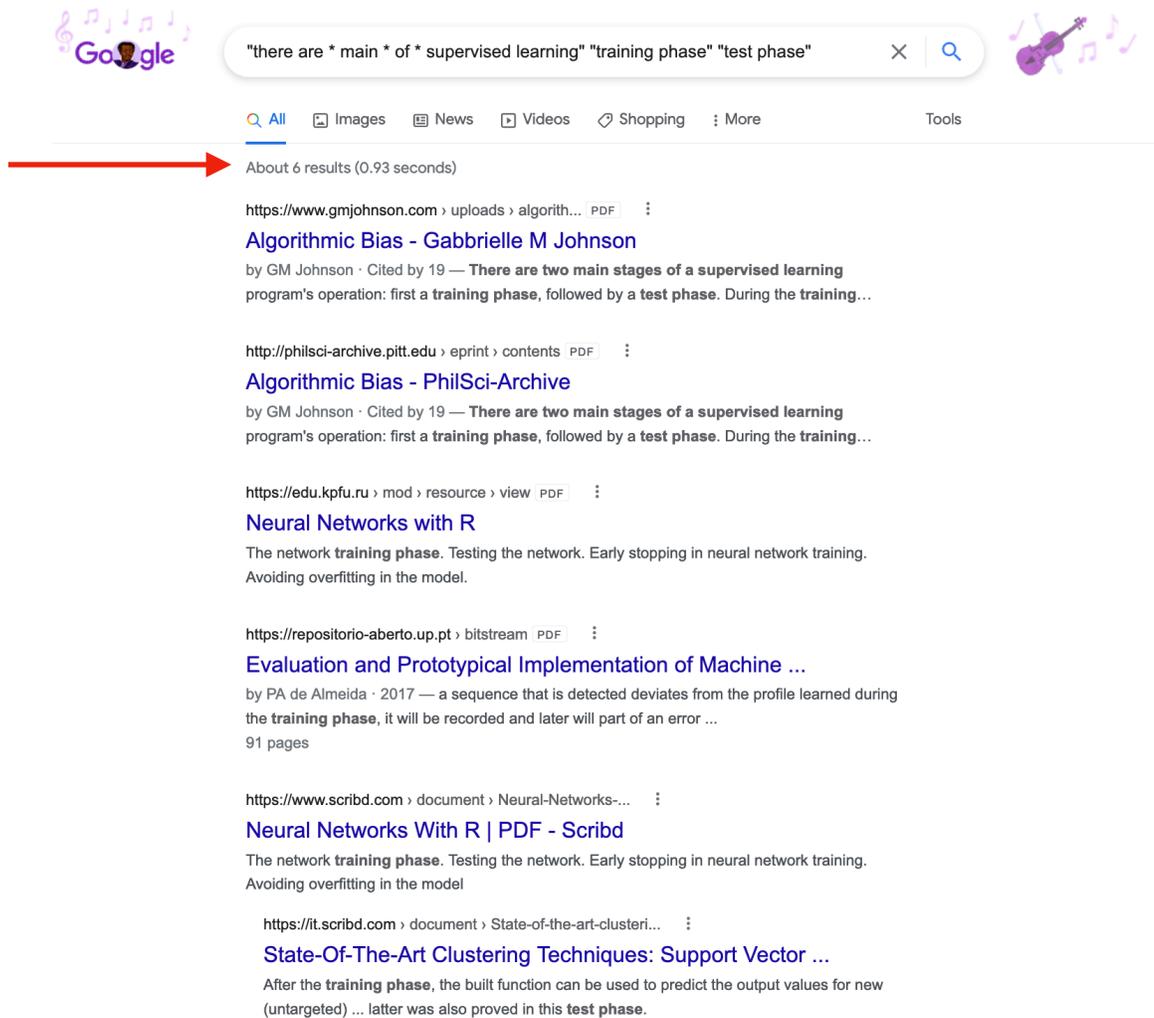
by GM Johnson · 2019 — One simple way to perform this task is to classify new instances on the basis of their proximity in the feature space to known classifications. For...

As you can see from the screenshot (or from your own Googling of the same key phrases), there are just 3 results that come up, all of which are my work (either my “Structure of Bias” paper or my dissertation).

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Finally compare when Professor Schellenberg writes “**There are three main phases of supervised learning: training phase, test phase**”, which I took to be non-accidentally similar to my passage “**there are two main stages of a supervised learning program’s operation: first a training phase, followed by a test phase.**”

Ex. 3: “**there are * main * of * supervised learning**” + “**training phase**” + “**test phase**”



As you can see from the screenshot (or from your own Googling of the same strings), there are just 6 results that come up, two of which are my work (different links to my “Algorithmic Bias” paper).

Now keep in mind that these searches only check a subset of the key phrases that overlap and take each phrase individually. Google searches for these key phrases throughout entire documents, and so results could have them show up anywhere throughout the document. Thus, the searches above do not take into account the fact that in both our papers, the phrases were found in close proximity or within the same paragraph.

Given this proximity, the other overlaps I haven’t searched for, and the fact that the paper includes the combination of all these searches together, I would suggest that the probability of this level of syntactic overlap being accidental is essentially zero. It is surely enough establish that Schellenberg and my papers have a level of syntactic overlap that no other paper in the field shares with ours. None of the papers she cites come up in these searches, as their similarity is on the word but not the phrase level.