Preliminary Analysis for Mental Health issues using Machine Learning

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Abstract—Ever since the pandemic started taking a retreat, the effects of it were still prevalent in terms of the long terms side affects of the disease itself, and the social side affects as well- mainly mental health issues. This term is pretty broad in terms of brain chemistry but the end result of it is something which has been talked about a lot in recent times. With general progress comes stress, which can lead to a variety of other problems. This publication highlights the use of Machine Learning algorithms like KNN, Random Forests, and combining it with techniques like Stacking, Bagging and Boosting to improve performance. Furthermore, the paper also highlights the use of modern web-building tools to combine the ML model with a user-friendly website as well.

Index Terms—Mental Health, Machine Learning, Bagging, Boosting, Django,

I. Introduction

A. Background

Mental health issues among young, working adults have become increasingly prevalent over the years, with significant shifts observed, particularly in the aftermath of the COVID-19 pandemic. Before the pandemic, factors such as work-related stress, career uncertainties, financial pressures, and the juggling of personal and professional responsibilities already contributed to mental health challenges in this demographic. However, the pandemic exacerbated these issues, introducing new stressors such as remote work challenges, social isolation, fears of job loss, and concerns about health and safety. The abrupt transition to remote work blurred the boundaries between work and personal life, leading to heightened stress levels and burnout. Additionally, social distancing measures limited in-person interactions and support networks, exacerbating feelings of loneliness and isolation. Financial instability resulting from job losses or economic downturns further heightened anxiety and depression. Moreover, the uncertainty surrounding the duration and impact of the pandemic added a layer of psychological distress. As a result, there has been a surge in mental health issues among young, working adults, with increased rates of anxiety, depression, and other mood disorders reported. The pandemic has highlighted the importance of prioritizing mental health support in the workplace and implementing strategies to address the evolving needs of this demographic, including remote mental health services, flexible work arrangements, and initiatives to promote work-life balance and resilience. Overall, the COVID-19 pandemic has accelerated the recognition and discussion of mental health issues among young, working adults, emphasizing the importance of proactive measures to support their well-being in the face of evolving challenges.

As the world gradually transitions into a post-COVID-19 situation, the landscape of mental health issues among young, working adults continues to evolve. While some individuals may experience relief as pandemic-related restrictions ease and vaccination rates increase, others may grapple with lingering effects of the crisis, including ongoing uncertainty, economic instability, and psychological trauma. The return to the office for some may evoke feelings of anxiety and apprehension, as they navigate changes in workplace dynamics and social interactions. Moreover, the pandemic has reshaped societal norms and expectations, leading to a reevaluation of priorities and lifestyles among young adults. Many may struggle to adapt to new routines and expectations, leading to feelings of stress and overwhelm. Additionally, the long-term effects of remote work, such as reduced social connections and blurred boundaries between work and personal life, may persist, contributing to mental health challenges. As organizations adapt to the changing landscape, there is a growing recognition of the importance of mental health support in the workplace. Employers are increasingly investing in resources and initiatives to promote employee well-being, including mental health awareness training, access to counseling services, and flexible work arrangements. Moreover, there is a greater emphasis on fostering a culture of open communication and support, where employees feel empowered to seek help and prioritize their mental health. If we were to gather data about employees personal and

professional lives, and relate it to whether or not they have sought help we can essentially train computer algorithms to predict the same for new data. This means that we can build a website that does all that work behind the scenes so that this project is accessible to a wider audience.
Furthermore, this publication will also explore the potential of Deep Neural Networks (DNNs) for binary Classifications.

B. General overview of the procedure

We will talk about the general procedure later on in this publication but for now we can estabish the basic idea:

- Gather the demographic data
- Perform Pre-processing
- Train the models
- Evaluate
- Integrate

II. Literature Survey

LR goes here.

III. Prepare Your Paper Before Styling

Before you begin to format your paper, first write and save the content as a separate text file. Complete all content and organizational editing before formatting. Please note sections III-A–III-E below for more information on proofreading, spelling and grammar.

Keep your text and graphic files separate until after the text has been formatted and styled. Do not number text heads—LaTeX will do that for you.

A. Abbreviations and Acronyms

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, ac, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

B. Units

- Use either SI (MKS) or CGS as primary units. (SI units are encouraged.) English units may be used as secondary units (in parentheses). An exception would be the use of English units as identifiers in trade, such as "3.5-inch disk drive".
- Avoid combining SI and CGS units, such as current in amperes and magnetic field in oersteds. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity that you use in an equation.
- Do not mix complete spellings and abbreviations of units: "Wb/m^2" or "webers per square meter", not "webers/m^2". Spell out units when they appear in text: ". . . a few henries", not ". . . a few H".
- Use a zero before decimal points: "0.25", not ".25". Use "cm^3", not "cc".)

C. Equations

Number equations consecutively. To make your equations more compact, you may use the solidus (/), the exp function, or appropriate exponents. Italicize Roman symbols for quantities and variables, but not Greek symbols. Use a long dash rather than a hyphen for a minus sign. Punctuate equations with commas or periods when they are part of a sentence, as in:

$$a + b = \gamma \tag{1}$$

Be sure that the symbols in your equation have been defined before or immediately following the equation. Use "(1)", not "Eq. (1)" or "equation (1)", except at the beginning of a sentence: "Equation (1) is . . ."

D. LaTeX-Specific Advice

Please use "soft" (e.g., "eqref–Eq″) cross references instead of "hard" references (e.g., (1)). That will make+ it possible to combine sections, add equations, or change the order of figures or citations without having to go through the file line by line.

Please don't use the –eqnarray″ equation environment. Use –align″ or –IEEEeqnarray″ instead. The –eqnarray″ environment leaves unsightly spaces around relation symbols.

Please note that the –subequations″ environment in LaTeX will increment the main equation counter even when there are no equation numbers displayed. If you forget that, you might write an article in which the equation numbers skip from (17) to (20), causing the copy editors to wonder if you've discovered a new method of counting.

BibTeX does not work by magic. It doesn't get the bibliographic data from thin air but from .bib files. If you use BibTeX to produce a bibliography you must send the .bib files.

LaTeX can't read your mind. If you assign the same label to a subsubsection and a table, you might find that Table I has been cross referenced as Table IV-B3.

LaTeX does not have precognitive abilities. If you put a "label command before the command that updates the counter it's supposed to be using, the label will pick up the last counter to be cross referenced instead. In particular, a "label command should not go before the caption of a figure or a table.

Do not use "nonumber inside the –array″ environment. It will not stop equation numbers inside –array″ (there won't be any anyway) and it might stop a wanted equation number in the surrounding equation.

E. Some Common Mistakes

- The word "data" is plural, not singular.
- The subscript for the permeability of vacuum μ_0, and other common scientific constants, is zero with subscript formatting, not a lowercase letter "o".
- In American English, commas, semicolons, periods, question and exclamation marks are located within

quotation marks only when a complete thought or name is cited, such as a title or full quotation. When quotation marks are used, instead of a bold or italic typeface, to highlight a word or phrase, punctuation should appear outside of the quotation marks. A parenthetical phrase or statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within the parentheses.)

- A graph within a graph is an "inset", not an "insert". The word alternatively is preferred to the word "alternately" (unless you really mean something that alternates).
- Do not use the word "essentially" to mean "approximately" or "effectively".
- In your paper title, if the words "that uses" can accurately replace the word "using", capitalize the "u"; if not, keep using lower-cased.
- Be aware of the different meanings of the homophones "affect" and "effect", "complement" and "compliment", "discreet" and "discrete", "principal" and "principle".
- Do not confuse "imply" and "infer".
- The prefix "non" is not a word; it should be joined to the word it modifies, usually without a hyphen.
- There is no period after the "et" in the Latin abbreviation "et al.".
- The abbreviation "i.e." means "that is", and the abbreviation "e.g." means "for example".

An excellent style manual for science writers is [7].

F. Authors and Affiliations

The class file is designed for, but not limited to, six authors. A minimum of one author is required for all conference articles. Author names should be listed starting from left to right and then moving down to the next line. This is the author sequence that will be used in future citations and by indexing services. Names should not be listed in columns nor group by affiliation. Please keep your affiliations as succinct as possible (for example, do not differentiate among departments of the same organization).

G. Identify the Headings

Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

Component heads identify the different components of your paper and are not topically subordinate to each other. Examples include Acknowledgments and References and, for these, the correct style to use is "Heading 5". Use "figure caption" for your Figure captions, and "table head" for your table title. Run-in heads, such as "Abstract", will require you to apply a style (in this case, italic) in addition to the style provided by the drop down menu to differentiate the head from the text.

Text heads organize the topics on a relational, hierarchical basis. For example, the paper title is the primary text head because all subsequent material relates and elaborates on this one topic. If there are two or more sub-topics, the next level head (uppercase Roman numerals) should be used and, conversely, if there are not at least two sub-topics, then no subheads should be introduced.

H. Figures and Tables

a) Positioning Figures and Tables: Place figures and tables at the top and bottom of columns. Avoid placing them in the middle of columns. Large figures and tables may span across both columns. Figure captions should be below the figures; table heads should appear above the tables. Insert figures and tables after they are cited in the text. Use the abbreviation "Fig. 1", even at the beginning of a sentence.

TABLE I
Table Type Styles

Table Head	Table Column Head		
	Table column subhead	Subhead	Subhead
copy	More table copy[a]		

[a]Sample of a Table footnote.

Fig. 1. Example of a figure caption.

Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity "Magnetization", or "Magnetization, M", not just "M". If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write "Magnetization (A/m)" or "Magnetization {A[m(1)]}", not just "A/m". Do not label axes with a ratio of quantities and units. For example, write "Temperature (K)", not "Temperature/K".

Acknowledgment

The preferred spelling of the word "acknowledgment" in America is without an "e" after the "g". Avoid the stilted expression "one of us (R. B. G.) thanks ...". Instead, try "R. B. G. thanks...". Put sponsor acknowledgments in the unnumbered footnote on the first page.

References

Please number citations consecutively within brackets [1]. The sentence punctuation follows the bracket [2]. Refer simply to the reference number, as in [3]—do not use "Ref. [3]" or "reference [3]" except at the beginning of a sentence: "Reference [3] was the first ..."

Number footnotes separately in superscripts. Place the actual footnote at the bottom of the column in which it was cited. Do not put footnotes in the abstract or reference list. Use letters for table footnotes.

Unless there are six authors or more give all authors' names; do not use "et al.". Papers that have not been published, even if they have been submitted for publication, should be cited as "unpublished" [4]. Papers that have been accepted for publication should be cited as "in press" [5]. Capitalize only the first word in a paper title, except for proper nouns and element symbols.

For papers published in translation journals, please give the English citation first, followed by the original foreign-language citation [6].

References

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