Storage Solutions and Data Analytics: RDBM,

Hadoop and APIs in Neural Networks Contexts

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*Abstract*

*This study investigates the relationship between Big Data management tools such as Relational Database Management System (RDBMS), Hadoop, and APIs, and how they can be separately interlinked with advanced data analytics, specifically neural networks. The purpose of the study is to compare a RDBMS with Hadoop when processing a 1.31 GB dataset, and then apply a Neural Network. To expand the scope, this study will also include the usage of APIs (Keras library) for implementing Neural Networks. This study was conducted using my personal laptop to load a 1.31 GB dataset into a RDBMS and Spark. I utilized Jupyter Notebooks to interact with these two technologies, exploring computing times, roadblocks faced, and other insights. Following this, we applied the same Neural Network to predict if certain jobs are more popular based on gender. Another aspect of the study involves utilizing an API; for this, we are employing Keras and a Convolutional Neural Network (CNN). Our aim is to evaluate the performance of the CNN model in classifying movie reviews as positive or negative based on their sentiment. The research findings indicate that using RDBMS or Hadoop for data processing is not as quick and straightforward as using an API like Keras, where you simply import the data without the need to worry about how to push it into databases, this becomes clear when modelling data using NN via Jupyter Notebooks.*

Keywords: Relational Database Management System, Hadoop, API, Keras, Neural Network (NN), Convolutional Neural Network (CNN)

# Introduction

Relational Database Management Systems have been well-established since the late 1970s; at that time, the concept of Big Data was not the same as it is today. As technology rapidly advanced, the industry needed to process large amounts of data. To address this need, an open-source framework for writing and running distributed applications, called Hadoop, entered the scene (Lam, 2010). These two technologies, RDMS and Hadoop, are great; however, the implementation of both requires a high level of technical software skill. This is where APIs offer a solution to this problem, which the industry refers to as Machine Learning as a Service (MLaaS), e.g., Azure ML or AWS ML, just to mention a few (Atakan Cetinsoy et al., 2016).

## Topic Overview

# Literature review

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Identify applicable funding agency here. If none, delete this text box.

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*a**b* 

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## Some Common Mistakes

* The word “data” is plural, not singular.
* The subscript for the permeability of vacuum **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.)
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* 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].

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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.

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1. Table Type Styles

| Table Head | Table Column Head | | |
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| Table column subhead | Subhead | Subhead |
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1. Sample of a Table footnote. (*Table footnote*)
2. Example of a figure caption. (*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”.

# Future work

# Conclusions

##### Acknowledgment *(Heading 5)*

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##### References

Cetinsoy, A., Martin, F.J., Ortega, J.A. and Petersen, P., 2016. The Past, Present, and Future of Machine Learning APIs*. In: PAPIs 2015 - Proceedings of the 2015 Conference on Predictive APIs and Apps*, vol. 50, JMLR: Workshop and Conference Proceedings, pp.43-49.‌

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