Use Cases in Big Data Software and Analytics

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My great Big Dat Paper

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ABSTRACT

This paper provides a sample of a LaTeX document which conforms, somewhat loosely, to the formatting guidelines for ACM SIG Proceedings.

KEYWORDS

ACM proceedings, LaTeX, text tagging

1 INTRODUCTION

This is my Intro

2 THE BODY OF THE PAPER

3 CONCLUSIONS

This is my conclusion.

ACKNOWLEDGMENTS

The authors would like to thank Dr. Yuhua Li for providing the matlab code of the *BEPS* method.

REFERENCES

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1 INTRODUCTION

The *proceedings* are the records of a conference. ACM seeks to give these conference by-products a uniform, high-quality appearance. To do this, ACM has some rigid requirements for the format of the proceedings documents: there is a specified format (balanced double columns), a specified set of fonts (Arial or Helvetica and Times Roman) in certain specified sizes, a specified live area, centered on the page, specified size of margins, specified column width and gutter size [1].

ACKNOWLEDGMENTS

The authors would like to thank

REFERENCES

[1] Ian Editor (Ed.). 2007. *The title of book one* (1st. ed.). The name of the series one, Vol. 9. University of Chicago Press, Chicago. https://doi.org/10.1007/3-540-09237-4

What Separates Big Data from Lots of Data

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ABSTRACT

TIn this paper, we will briefly analyze the history of data to show how having *lots of data* stored in large databases hardly differs from data storage and analysis in the early days of SQL, or even before computers. We then explain how *big data* represents a paradigmatic shift from traditional large data storage and analysis. We conclude that organizations that do not understand this paradigmatic shift are more likely to fail in big data projects.

KEYWORDS

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1 INTRODUCTION

This is my introduction. [1]

2 CONCLUSIONS

I conclude that...

ACKNOWLEDGMENTS

Generic acknowledgements

REFERENCES

[1] Carl Lagoze. 2014. Big Data, data integrity, and the fracturing of the control zone. *Big Data and Society* (NO 2014). https://doi.org/10.1177/2053951714558281

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ABSTRACT

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2 THE BODY OF THE PAPER

Typically, the body of a paper is organized into a hierarchical structure, with numbered or unnumbered headings for sections, subsections, sub-subsections, and even smaller sections. The command `\section` that precedes this paragraph is part of such a hierarchy. LaTeX handles the numbering and placement of these headings for you, when you use the appropriate heading commands around the titles of the headings. If you want a sub-subsection or smaller part to be unnumbered in your output, simply append an asterisk to the command name. Examples of both numbered and unnumbered headings will appear throughout the balance of this sample document.

Because the entire article is contained in the **document** environment, you can indicate the start of a new paragraph with a blank line in your input file; that is why this sentence forms a separate paragraph.

2.1 Type Changes and *Special* Characters

We have already seen several typeface changes in this sample. You can indicate italicized words or phrases in your text with the command `\textit`; emboldening with the command `\textbf` and typewriter-style (for instance, for computer code) with `\texttt`. But remember, you do not have to indicate typestyle changes when such changes are part of the *structural* elements of your article; for instance, the heading of this subsection will be in a sans serif[1] typeface, but that is handled by the document class file. Take care with the use of the curly braces in typeface changes; they mark the beginning and end of the text that is to be in the different typeface.

You can use whatever symbols, accented characters, or non-English characters you need anywhere in your document; you can find a complete list of what is available in the *LaTeX User's Guide* [25].

2.2 Math Equations

You may want to display math equations in three distinct styles: inline, numbered or non-numbered display. Each of the three are discussed in the next sections.

2.2.1 Inline (In-text) Equations. A formula that appears in the running text is called an inline or in-text formula. It is produced by the **math** environment, which can be invoked with the usual `\begin . . . \end` construction or with the short form `$ . . . $`. You can use any of the symbols and structures, from α to ω, available in LaTeX [25]; this section will simply show a few examples of in-text equations in context. Notice how this equation:
$\lim_{n\rightarrow \infty}x=0$,
set here in in-line math style, looks slightly different when set in display style. (See next section).

2.2.2 Display Equations. A numbered display equation—one set off by vertical space from the text and centered horizontally—is produced by the **equation** environment. An unnumbered display equation is produced by the **displaymath** environment.

Again, in either environment, you can use any of the symbols and structures available in LaTeX; this section will just give a couple of examples of display equations in context. First, consider the equation, shown as an inline equation above:

$$\lim_{n\rightarrow \infty}x=0 \tag{1}$$

Notice how it is formatted somewhat differently in the **displaymath** environment. Now, we'll enter an unnumbered equation:

$$\sum_{i=0}^{\infty} x + 1$$

and follow it with another numbered equation:

$$\sum_{i=0}^{\infty}x_i=\int_{0}^{\pi+2} f \tag{2}$$

just to demonstrate LaTeX's able handling of numbering.

2.3 Citations

Citations to articles [6–8, 18], conference proceedings [8] or maybe books [25, 33] listed in the Bibliography section of your article will

[1]Another footnote here. Let's make this a rather long one to see how it looks. Footnotes must be avoided.

occur throughout the text of your article. You should use BibTeX to automatically produce this bibliography; you simply need to insert one of several citation commands with a key of the item cited in the proper location in the `.tex` file [25]. The key is a short reference you invent to uniquely identify each work; in this sample document, the key is the first author's surname and a word from the title. This identifying key is included with each item in the `.bib` file for your article.

The details of the construction of the `.bib` file are beyond the scope of this sample document, but more information can be found in the *Author's Guide*, and exhaustive details in the *LaTeX User's Guide* by Lamport [25].

This article shows only the plainest form of the citation command, using `\cite`.

Some examples. A paginated journal article [2], an enumerated journal article [11], a reference to an entire issue [10], a monograph (whole book) [24], a monograph/whole book in a series (see 2a in spec. document) [17], a divisible-book such as an anthology or compilation [13] followed by the same example, however we only output the series if the volume number is given [14] (so Editor00a's series should NOT be present since it has no vol. no.), a chapter in a divisible book [36], a chapter in a divisible book in a series [12], a multi-volume work as book [23], an article in a proceedings (of a conference, symposium, workshop for example) (paginated proceedings article) [4], a proceedings article with all possible elements [35], an example of an enumerated proceedings article [15], an informally published work [16], a doctoral dissertation [9], a master's thesis: [5], an online document / world wide web resource [1, 29, 37], a video game (Case 1) [28] and (Case 2) [27] and [26] and (Case 3) a patent [34], work accepted for publication [30], 'YYYYb'-test for prolific author [31] and [32]. Other cites might contain 'duplicate' DOI and URLs (some SIAM articles) [22]. Boris / Barbara Beeton: multi-volume works as books [20] and [19].

A couple of citations with DOIs: [21, 22].

Online citations: [37–39].

We use jabref to manage all citations. A paper without managing a bib file will be returned without review. in the bibtex file all urls are added to rfernces with the *url* filed. They are not to be included in the *howpublished* or *note* field.

2.4 Theorem-like Constructs

Other common constructs that may occur in your article are the forms for logical constructs like theorems, axioms, corollaries and proofs. ACM uses two types of these constructs: theorem-like and definition-like.

Here is a theorem:

Theorem 2.1. *Let f be continuous on $[a, b]$. If G is an antiderivative for f on $[a, b]$, then*

$$\int_a^b f(t)\,dt = G(b) - G(a).$$

Here is a definition:

Definition 2.2. If z is irrational, then by e^z we mean the unique number that has logarithm z:

$$\log e^z = z.$$

The pre-defined theorem-like constructs are **theorem**, **conjecture**, **proposition**, **lemma** and **corollary**. The pre-defined definition-like constructs are **example** and **definition**. You can add your own constructs using the *amsthm* interface [3]. The styles used in the `\theoremstyle` command are **acmplain** and **acmdefinition**.

Another construct is **proof**, for example,

Proof. Suppose on the contrary there exists a real number L such that

$$\lim_{x\to\infty} \frac{f(x)}{g(x)} = L.$$

Then

$$l = \lim_{x\to c} f(x) = \lim_{x\to c} \left[gx \cdot \frac{f(x)}{g(x)} \right] = \lim_{x\to c} g(x) \cdot \lim_{x\to c} \frac{f(x)}{g(x)} = 0 \cdot L = 0,$$

which contradicts our assumption that $l \neq 0$. □

3 CONCLUSIONS

This paragraph will end the body of this sample document. Remember that you might still have Acknowledgments or Appendices; brief samples of these follow. There is still the Bibliography to deal with; and we will make a disclaimer about that here: with the exception of the reference to the LaTeX book, the citations in this paper are to articles which have nothing to do with the present subject and are used as examples only.

Generated by bibtex from your `.bib` file. Run latex, then bibtex, then latex twice (to resolve references) to create the `.bbl` file. Insert that `.bbl` file into the `.tex` source file and comment out the command `\thebibliography`.

4 MORE HELP FOR THE HARDY

Of course, reading the source code is always useful. The file `acmart.pdf` contains both the user guide and the commented code.

ACKNOWLEDGMENTS

The authors would like to thank Dr. Yuhua Li for providing the matlab code of the *BEPS* method.

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ABSTRACT

This paper

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ACM proceedings, LaTeX, text tagging

1 INTRODUCTION

The *proceedings* are the [1]

2 THE BODY OF THE PAPER

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3 CONCLUSIONS

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ABSTRACT

This paper provides a sample of a LaTeX document which conforms, somewhat loosely, to the formatting guidelines for ACM SIG Proceedings.

KEYWORDS

ACM proceedings, LaTeX, text tagging

1 INTRODUCTION

The *proceedings* are the records of a conference. ACM seeks to give these conference by-products a uniform, high-quality appearance. To do this, ACM has some rigid requirements for the format of the proceedings documents: there is a specified format (balanced double columns), a specified set of fonts (Arial or Helvetica and Times Roman) in certain specified sizes, a specified live area, centered on the page, specified size of margins, specified column width and gutter size [1].

ACKNOWLEDGMENTS

The authors would like to thank

REFERENCES

[1] Ian Editor (Ed.). 2007. *The title of book one* (1st. ed.). The name of the series one, Vol. 9. University of Chicago Press, Chicago. https://doi.org/10.1007/3-540-09237-4

My great Big Dat Paper

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Big Data Analytics and Edge Computing

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ABSTRACT

With the exponential increase in the number of connected IoT devices, the data generated by these devices has grown enormously. Sending this data to a centralized server or cloud results in enormous network traffic and may lead to failures and increased latency. One solution of this problem is to do some processing on the edge devices. This is extremely helpful in providing responsive and real time analytics.

1 INTRODUCTION

With the rapid increase in the acceptanceof Internet of Things (IoT) devices across various fields in the world, ranging from industrial sensors to lifestyle and sports products, and the consequent increase in the data generated by such devices, there is a pressing demand for devices and processes that can analyze this data and provide responsive analytics.[1]. With increase in the number of sucn devices, it gets increasingly dificult to perform all analytics on a server in a traditional manner. Thus, more recent approaches aim to push a part of this computation closer to the end user of the device, or closer to the edge.

REFERENCES

[1] Yogesh Simmhan. 2017. IoT Analytics Across Edge and Cloud Platforms. IEEE IOT Newsletter. (May 2017). https://iot.ieee.org/newsletter/may-2017/iot-analytics-across-edge-and-cloud-platforms.html

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Big Data Analytics using Spark

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ABSTRACT

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The *proceedings* are the records of a conference. ACM seeks to give these conference by-products a uniform, high-quality appearance. To do this, ACM has some rigid requirements for the format of the proceedings documents: there is a specified format (balanced double columns), a specified set of fonts (Arial or Helvetica and Times Roman) in certain specified sizes, a specified live area, centered on the page, specified size of margins, specified column width and gutter size.

2 THE BODY OF THE PAPER

Typically, the body of a paper is organized into a hierarchical structure, with numbered or unnumbered headings for sections, subsections, sub-subsections, and even smaller sections. The command `\section` that precedes this paragraph is part of such a hierarchy. LaTeX handles the numbering and placement of these headings for you, when you use the appropriate heading commands around the titles of the headings. If you want a sub-subsection or smaller part to be unnumbered in your output, simply append an asterisk to the command name. Examples of both numbered and unnumbered headings will appear throughout the balance of this sample document.

Because the entire article is contained in the **document** environment, you can indicate the start of a new paragraph with a blank line in your input file; that is why this sentence forms a separate paragraph.

2.1 Type Changes and *Special* Characters

We have already seen several typeface changes in this sample. You can indicate italicized words or phrases in your text with the command `\textit`; emboldening with the command `\textbf` and typewriter-style (for instance, for computer code) with `\texttt`. But remember, you do not have to indicate typestyle changes when such changes are part of the *structural* elements of your article; for instance, the heading of this subsection will be in a sans serif[1] typeface, but that is handled by the document class file. Take care with the use of the curly braces in typeface changes; they mark the beginning and end of the text that is to be in the different typeface.

You can use whatever symbols, accented characters, or non-English characters you need anywhere in your document; you can find a complete list of what is available in the *LaTeX User's Guide* [26].

2.2 Math Equations

You may want to display math equations in three distinct styles: inline, numbered or non-numbered display. Each of the three are discussed in the next sections.

2.2.1 *Inline (In-text) Equations.*

A formula that appears in the running text is called an inline or in-text formula. It is produced by the **math** environment, which can be invoked with the usual `\begin . . . \end` construction or with the short form `$ . . . $`. You can use any of the symbols and structures, from α to ω, available in LaTeX [26]; this section will simply show a few examples of in-text equations in context. Notice how this equation:

$\lim_{n\rightarrow \infty} x = 0$,

set here in in-line math style, looks slightly different when set in display style. (See next section).

2.2.2 *Display Equations.*

A numbered display equation—one set off by vertical space from the text and centered horizontally—is produced by the **equation** environment. An unnumbered display equation is produced by the **displaymath** environment.

Again, in either environment, you can use any of the symbols and structures available in LaTeX; this section will just give a couple of examples of display equations in context. First, consider the equation, shown as an inline equation above:

$$\lim_{n\rightarrow \infty} x = 0 \tag{1}$$

Notice how it is formatted somewhat differently in the **displaymath** environment. Now, we'll enter an unnumbered equation:

$$\sum_{i=0}^{\infty} x + 1$$

and follow it with another numbered equation:

$$\sum_{i=0}^{\infty} x_i = \int_{0}^{\pi+2} f \tag{2}$$

just to demonstrate LaTeX's able handling of numbering.

2.3 Citations

Citations to articles [6–8, 19], conference proceedings [8] or maybe books [26, 34] listed in the Bibliography section of your article will

[1] Another footnote here. Let's make this a rather long one to see how it looks. Footnotes must be avoided.

occur throughout the text of your article. You should use BibTeX to automatically produce this bibliography; you simply need to insert one of several citation commands with a key of the item cited in the proper location in the `.tex` file [26]. The key is a short reference you invent to uniquely identify each work; in this sample document, the key is the first author's surname and a word from the title. This identifying key is included with each item in the `.bib` file for your article.

The details of the construction of the `.bib` file are beyond the scope of this sample document, but more information can be found in the *Author's Guide*, and exhaustive details in the *LaTeX User's Guide* by Lamport [26].

This article shows only the plainest form of the citation command, using `\cite`.

Some examples. A paginated journal article [2], an enumerated journal article [11], a reference to an entire issue [10], a monograph (whole book) [25], a monograph/whole book in a series (see 2a in spec. document) [18], a divisible-book such as an anthology or compilation [13] followed by the same example, however we only output the series if the volume number is given [14] (so Editor00a's series should NOT be present since it has no vol. no.), a chapter in a divisible book [37], a chapter in a divisible book in a series [12], a multi-volume work as book [24], an article in a proceedings (of a conference, symposium, workshop for example) (paginated proceedings article) [4], a proceedings article with all possible elements [36], an example of an enumerated proceedings article [16], an informally published work [17], a doctoral dissertation [9], a master's thesis: [5], an online document / world wide web resource [1, 30, 38], a video game (Case 1) [29] and (Case 2) [28] and [27] and (Case 3) a patent [35], work accepted for publication [31], 'YYYYb'-test for prolific author [32] and [33]. Other cites might contain 'duplicate' DOI and URLs (some SIAM articles) [23]. Boris / Barbara Beeton: multi-volume works as books [21] and [20].

A couple of citations with DOIs: [22, 23].

Online citations: [38–40].

We use jabref to manage all citations. A paper without managing a bib file will be returned without review. in the bibtex file all urls are added to rfernces with the *url* filed. They are not to be included in the *howpublished* or *note* field.

2.4 Tables

Because tables cannot be split across pages, the best placement for them is typically the top of the page nearest their initial cite. To ensure this proper "floating" placement of tables, use the environment **table** to enclose the table's contents and the table caption. The contents of the table itself must go in the **tabular** environment, to be aligned properly in rows and columns, with the desired horizontal and vertical rules. Again, detailed instructions on **tabular** material are found in the *LaTeX User's Guide*.

Immediately following this sentence is the point at which Table 1 is included in the input file; compare the placement of the table here with the table in the printed output of this document.

[Table 1 about here.]

To set a wider table, which takes up the whole width of the page's live area, use the environment **table*** to enclose the table's contents and the table caption. As with a single-column table, this wide table will "float" to a location deemed more desirable. Immediately following this sentence is the point at which Table 2 is included in the input file; again, it is instructive to compare the placement of the table here with the table in the printed output of this document.

[Table 2 about here.]

It is strongly recommended to use the package booktabs [15] and follow its main principles of typography with respect to tables:

(1) Never, ever use vertical rules.
(2) Never use double rules.

It is also a good idea not to overuse horizontal rules.

2.5 Figures

Like tables, figures cannot be split across pages; the best placement for them is typically the top or the bottom of the page nearest their initial cite. To ensure this proper "floating" placement of figures, use the environment **figure** to enclose the figure and its caption.

This sample document contains examples of `.eps` files to be displayable with LaTeX. If you work with pdfLaTeX, use files in the `.pdf` format. Note that most modern TeX systems will convert `.eps` to `.pdf` for you on the fly. More details on each of these are found in the *Author's Guide*.

[Figure 1 about here.]

[Figure 2 about here.]

As was the case with tables, you may want a figure that spans two columns. To do this, and still to ensure proper "floating" placement of tables, use the environment **figure*** to enclose the figure and its caption. And don't forget to end the environment with **figure***, not **figure**!

[Figure 3 about here.]

[Figure 4 about here.]

2.6 Theorem-like Constructs

Other common constructs that may occur in your article are the forms for logical constructs like theorems, axioms, corollaries and proofs. ACM uses two types of these constructs: theorem-like and definition-like.

Here is a theorem:

THEOREM 2.1. *Let f be continuous on $[a, b]$. If G is an antiderivative for f on $[a, b]$, then*

$$\int_a^b f(t)\,dt = G(b) - G(a).$$

Here is a definition:

Definition 2.2. If z is irrational, then by e^z we mean the unique number that has logarithm z:

$$\log e^z = z.$$

The pre-defined theorem-like constructs are **theorem**, **conjecture**, **proposition**, **lemma** and **corollary**. The pre-defined definition-like constructs are **example** and **definition**. You can add your own constructs using the *amsthm* interface [3]. The styles used in the `\theoremstyle` command are **acmplain** and **acmdefinition**.

Another construct is **proof**, for example, Proof. Suppose on the contrary there exists a real number L such that

$$\lim_{x\to\infty} \frac{f(x)}{g(x)} = L.$$

Then

$$l = \lim_{x\to c} f(x) = \lim_{x\to c}\left[gx \cdot \frac{f(x)}{g(x)}\right] = \lim_{x\to c} g(x) \cdot \lim_{x\to c} \frac{f(x)}{g(x)} = 0 \cdot L = 0,$$

which contradicts our assumption that $l \neq 0$. □

3 CONCLUSIONS

This paragraph will end the body of this sample document. Remember that you might still have Acknowledgments or Appendices; brief samples of these follow. There is still the Bibliography to deal with; and we will make a disclaimer about that here: with the exception of the reference to the LaTeX book, the citations in this paper are to articles which have nothing to do with the present subject and are used as examples only.

A HEADINGS IN APPENDICES

The rules about hierarchical headings discussed above for the body of the article are different in the appendices. In the **appendix** environment, the command **section** is used to indicate the start of each Appendix, with alphabetic order designation (i.e., the first is A, the second B, etc.) and a title (if you include one). So, if you need hierarchical structure *within* an Appendix, start with **subsection** as the highest level. Here is an outline of the body of this document in Appendix-appropriate form:

A.1 Introduction

A.2 The Body of the Paper

A.2.1 Type Changes and Special Characters.

A.2.2 Math Equations.

Inline (In-text) Equations.

Display Equations.

A.2.3 Citations.

A.2.4 Tables.

A.2.5 Figures.

A.2.6 Theorem-like Constructs.

A Caveat for the TeX Expert.

A.3 Conclusions

A.4 References

Generated by bibtex from your `.bib` file. Run latex, then bibtex, then latex twice (to resolve references) to create the `.bbl` file. Insert that `.bbl` file into the `.tex` source file and comment out the command `\thebibliography`.

B MORE HELP FOR THE HARDY

Of course, reading the source code is always useful. The file `acmart.pdf` contains both the user guide and the commented code.

ACKNOWLEDGMENTS

The authors would like to thank Dr. Yuhua Li for providing the matlab code of the *BEPS* method.

The authors would also like to thank the anonymous referees for their valuable comments and helpful suggestions. The work is supported by the National Natural Science Foundation of China under Grant No.: 61273304 and Young Scientsts' Support Program (http://www.nnsf.cn/youngscientsts).

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List of Figures

Figure 1: A sample black and white graphic.

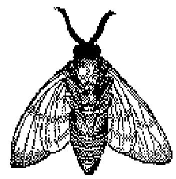

Figure 2: A sample black and white graphic that has been resized with the `includegraphics` command.

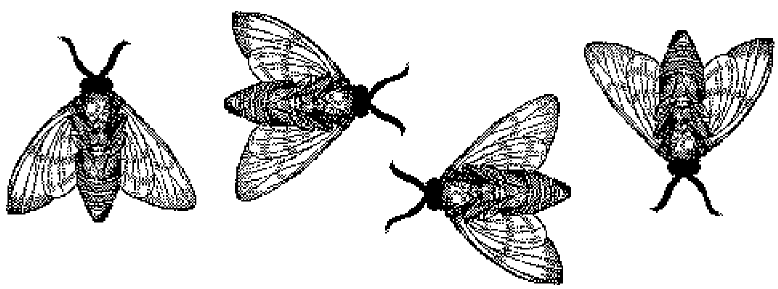

Figure 3: A sample black and white graphic that needs to span two columns of text.

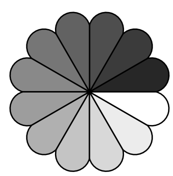

Figure 4: A sample black and white graphic that has been resized with the `includegraphics` command.

List of Tables

Table 1: Frequency of Special Characters

Non-English or Math	Frequency	Comments
Ø	1 in 1,000	For Swedish names
π	1 in 5	Common in math
$	4 in 5	Used in business
Ψ_1^2	1 in 40,000	Unexplained usage

Table 2: Some Typical Commands

Command	A Number	Comments
`\author`	100	Author
`\table`	300	For tables
`\table*`	400	For wider tables

Big Data Analytics and High Performance Computing

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ABSTRACT

This paper provides an introduction to Big Data and High Performance Computing and tries to find how they are related to each other.

KEYWORDS

ACM proceedings, LaTeX, text tagging

1 INTRODUCTION

Big data is a term for data sets that are so large or complex that traditional data processing application software is inadequate to deal with them. Big data challenges include capturing data, data storage, data analysis, search, sharing, transfer, visualization, querying, updating and information privacy.

2 THE BODY OF THE PAPER

3 CONCLUSIONS

This paragraph will end the body of this sample document. Remember that you might still have Acknowledgments or Appendices; brief samples of these follow. There is still the Bibliography to deal with; and we will make a disclaimer about that here: with the exception of the reference to the LaTeX book, the citations in this paper are to articles which have nothing to do with the present subject and are used as examples only.

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The rules about hierarchical headings discussed above for the body of the article are different in the appendices. In the **appendix** environment, the command **section** is used to indicate the start of each Appendix, with alphabetic order designation (i.e., the first is A, the second B, etc.) and a title (if you include one). So, if you need hierarchical structure *within* an Appendix, start with **subsection** as the highest level. Here is an outline of the body of this document in Appendix-appropriate form:

A.1 Introduction

A.2 The Body of the Paper

A.2.1 Type Changes and Special Characters.

A.2.2 Math Equations.

Inline (In-text) Equations.

Display Equations.

A.2.3 Citations.

A.2.4 Tables.

A.2.5 Figures.

A.2.6 Theorem-like Constructs.

A Caveat for the TeX Expert.

A.3 Conclusions

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REFERENCES

Big Data and Deep Learning

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ABSTRACT

This paper provides a sample of a LaTeX document which conforms, somewhat loosely, to the formatting guidelines for ACM SIG Proceedings.

KEYWORDS

ACM proceedings, LaTeX, text tagging

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The *proceedings* are the records of a conference. ACM seeks to give these conference by-products a uniform, high-quality appearance. To do this, ACM has some rigid requirements for the format of the proceedings documents: there is a specified format (balanced double columns), a specified set of fonts (Arial or Helvetica and Times Roman) in certain specified sizes, a specified live area, centered on the page, specified size of margins, specified column width and gutter size.

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REFERENCES

Big Data Application in Web Search and Text Mining

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ABSTRACT

Because of the rapid development of social media, there are gigantic amount of data generated in every second on the web. And those data could be stored in any forms like text, videos, images or their combinations. The more complicated forms of data, the more space it will take up and will cost more time to read it. Although most of today's personal computers have a very high performance, it is extremely difficult to process and analyze useful text information from those huge amount of unstructured data by using traditional single computer methods without the help of big data tools or text mining techniques. Fortunately, the improvements in big data application are also increasing fast in order to support those difficult works on web search and text mining. In this paper, we first study the data analytic steps in web search, then analyze some of the popular approaches or algorithms (e.g. Hubs, PageRank, etc), and at last, we discuss their applications in this field of big data.

KEYWORDS

social media, web search, text mining, PageRank, Hubs

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2 DATA ANALYTIC STEPS

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Automated Information Extraction in Electronic Health Records

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ABSTRACT

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ACKNOWLEDGMENTS

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Distributed Environment For Parallel Neural Networks

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ABSTRACT

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REFERENCES

Big Data Analysis using MapReduce

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ABSTRACT

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ACKNOWLEDGMENTS

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Big Data and Artificial Neural Networks

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ABSTRACT

This is my abstract.

KEYWORDS

ACM proceedings, LaTeX, text tagging

1 INTRODUCTION

This is my Introduction

2 CONCLUSIONS

This is my Conlusion

ACKNOWLEDGMENTS

The authors would like to thank Dr. Gregor von Laszewski for all the help he has provided for this paper.

REFERENCES

Big Data Analytics in Sports - Track and Field

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ABSTRACT

This paper covers the impact that Big Data has and could have on the sport of track and field.

KEYWORDS

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1 INTRODUCTION

This is my introduction

2 THE BODY OF THE PAPER

This is the body of my paper

3 CONCLUSIONS

This is my conclusion

ACKNOWLEDGMENTS

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Big Data's influence on ecommerce and lifestyle

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ABSTRACT

This paper studies how big data is applied in ecommerce and its influence on lifestyle.

KEYWORDS

big data, ecommerce

1 INTRODUCTION

This is my introduction

1.1 Citations

Citations to articles [**?**]

ACKNOWLEDGMENTS

The authors would like to thank Dr. Yuhua Li for providing the matlab code of the *BEPS* method.

REFERENCES

Big Data Analytic Architecture for Real Time Traffic Control

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ABSTRACT

This paper provides a sample of a LaTeX document which conforms, somewhat loosely, to the formatting guidelines for ACM SIG Proceedings.

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1 INTRODUCTION

This is a introduction.

2 THE BODY OF THE PAPER

Typically, the body of a paper is organized into a hierarchical structure, with numbered or unnumbered headings for sections, subsections, sub-subsections, and even smaller sections. The command `\section` that precedes this paragraph is part of such a hierarchy. LaTeX handles the numbering and placement of these headings for you, when you use the appropriate heading commands around the titles of the headings. If you want a sub-subsection or smaller part to be unnumbered in your output, simply append an asterisk to the command name. Examples of both numbered and unnumbered headings will appear throughout the balance of this sample document.

Because the entire article is contained in the **document** environment, you can indicate the start of a new paragraph with a blank line in your input file; that is why this sentence forms a separate paragraph.

2.1 Type Changes and *Special* Characters

We have already seen several typeface changes in this sample. You can indicate italicized words or phrases in your text with the command `\textit`; emboldening with the command `\textbf` and typewriter-style (for instance, for computer code) with `\texttt`. But remember, you do not have to indicate typestyle changes when such changes are part of the *structural* elements of your article; for instance, the heading of this subsection will be in a sans serif[1] typeface, but that is handled by the document class file. Take care with the use of the curly braces in typeface changes; they mark the beginning and end of the text that is to be in the different typeface.

You can use whatever symbols, accented characters, or non-English characters you need anywhere in your document; you can find a complete list of what is available in the *LaTeX User's Guide* [26].

[1]Another footnote here. Let's make this a rather long one to see how it looks. Footnotes must be avoided.

2.2 Math Equations

You may want to display math equations in three distinct styles: inline, numbered or non-numbered display. Each of the three are discussed in the next sections.

2.2.1 *Inline (In-text) Equations.*

A formula that appears in the running text is called an inline or in-text formula. It is produced by the **math** environment, which can be invoked with the usual `\begin . . . \end` construction or with the short form `$ . . . $`. You can use any of the symbols and structures, from α to ω, available in LaTeX [26]; this section will simply show a few examples of in-text equations in context. Notice how this equation:
$\lim_{n\rightarrow \infty} x = 0$,
set here in in-line math style, looks slightly different when set in display style. (See next section).

2.2.2 *Display Equations.*

A numbered display equation—one set off by vertical space from the text and centered horizontally—is produced by the **equation** environment. An unnumbered display equation is produced by the **displaymath** environment.

Again, in either environment, you can use any of the symbols and structures available in LaTeX; this section will just give a couple of examples of display equations in context. First, consider the equation, shown as an inline equation above:

$$\lim_{n\rightarrow \infty} x = 0 \tag{1}$$

Notice how it is formatted somewhat differently in the **displaymath** environment. Now, we'll enter an unnumbered equation:

$$\sum_{i=0}^{\infty} x + 1$$

and follow it with another numbered equation:

$$\sum_{i=0}^{\infty} x_i = \int_{0}^{\pi+2} f \tag{2}$$

just to demonstrate LaTeX's able handling of numbering.

2.3 Citations

Citations to articles [6–8, 19], conference proceedings [8] or maybe books [26, 34] listed in the Bibliography section of your article will occur throughout the text of your article. You should use BibTeX to automatically produce this bibliography; you simply need to insert one of several citation commands with a key of the item cited in the proper location in the `.tex` file [26]. The key is a short reference you invent to uniquely identify each work; in this sample document, the key is the first author's surname and a word from the title. This identifying key is included with each item in the `.bib` file for your article.

The details of the construction of the `.bib` file are beyond the scope of this sample document, but more information can be found in the *Author's Guide*, and exhaustive details in the *LaTeX User's Guide* by Lamport [26].

This article shows only the plainest form of the citation command, using `\cite`.

Some examples. A paginated journal article [2], an enumerated journal article [11], a reference to an entire issue [10], a monograph (whole book) [25], a monograph/whole book in a series (see 2a in spec. document) [18], a divisible-book such as an anthology or compilation [13] followed by the same example, however we only output the series if the volume number is given [14] (so Editor00a's series should NOT be present since it has no vol. no.), a chapter in a divisible book [37], a chapter in a divisible book in a series [12], a multi-volume work as book [24], an article in a proceedings (of a conference, symposium, workshop for example) (paginated proceedings article) [4], a proceedings article with all possible elements [36], an example of an enumerated proceedings article [16], an informally published work [17], a doctoral dissertation [9], a master's thesis: [5], an online document / world wide web resource [1, 30, 38], a video game (Case 1) [29] and (Case 2) [28] and [27] and (Case 3) a patent [35], work accepted for publication [31], 'YYYYb'-test for prolific author [32] and [33]. Other cites might contain 'duplicate' DOI and URLs (some SIAM articles) [23]. Boris / Barbara Beeton: multi-volume works as books [21] and [20].

A couple of citations with DOIs: [22, 23].

Online citations: [38–40].

We use jabref to manage all citations. A paper without managing a bib file will be returned without review. in the bibtex file all urls are added to rfernces with the *url* filed. They are not to be included in the *howpublished* or *note* field.

2.4 Tables

Because tables cannot be split across pages, the best placement for them is typically the top of the page nearest their initial cite. To ensure this proper "floating" placement of tables, use the environment **table** to enclose the table's contents and the table caption. The contents of the table itself must go in the **tabular** environment, to be aligned properly in rows and columns, with the desired horizontal and vertical rules. Again, detailed instructions on **tabular** material are found in the *LaTeX User's Guide*.

Immediately following this sentence is the point at which Table 1 is included in the input file; compare the placement of the table here with the table in the printed output of this document.

[Table 1 about here.]

To set a wider table, which takes up the whole width of the page's live area, use the environment **table*** to enclose the table's contents and the table caption. As with a single-column table, this wide table will "float" to a location deemed more desirable. Immediately following this sentence is the point at which Table 2 is included in the input file; again, it is instructive to compare the placement of the table here with the table in the printed output of this document.

[Table 2 about here.]

It is strongly recommended to use the package booktabs [15] and follow its main principles of typography with respect to tables:

(1) Never, ever use vertical rules.
(2) Never use double rules.

It is also a good idea not to overuse horizontal rules.

2.5 Figures

Like tables, figures cannot be split across pages; the best placement for them is typically the top or the bottom of the page nearest their initial cite. To ensure this proper "floating" placement of figures, use the environment **figure** to enclose the figure and its caption.

This sample document contains examples of `.eps` files to be displayable with LaTeX. If you work with pdfLaTeX, use files in the `.pdf` format. Note that most modern TeX systems will convert `.eps` to `.pdf` for you on the fly. More details on each of these are found in the *Author's Guide*.

As was the case with tables, you may want a figure that spans two columns. To do this, and still to ensure proper "floating" placement of tables, use the environment **figure*** to enclose the figure and its caption. And don't forget to end the environment with **figure***, not **figure**!

2.6 Theorem-like Constructs

Other common constructs that may occur in your article are the forms for logical constructs like theorems, axioms, corollaries and proofs. ACM uses two types of these constructs: theorem-like and definition-like.

Here is a theorem:

THEOREM 2.1. *Let f be continuous on $[a, b]$. If G is an antiderivative for f on $[a, b]$, then*

$$\int_a^b f(t)\,dt = G(b) - G(a).$$

Here is a definition:

Definition 2.2. If z is irrational, then by e^z we mean the unique number that has logarithm z:

$$\log e^z = z.$$

The pre-defined theorem-like constructs are **theorem**, **conjecture**, **proposition**, **lemma** and **corollary**. The pre-defined definition-like constructs are **example** and **definition**. You can add your own constructs using the *amsthm* interface [3]. The styles used in the `\theoremstyle` command are **acmplain** and **acmdefinition**.

Another construct is **proof**, for example,

PROOF. Suppose on the contrary there exists a real number L such that

$$\lim_{x\to\infty} \frac{f(x)}{g(x)} = L.$$

Then

$$l = \lim_{x\to c} f(x) = \lim_{x\to c} \left[gx \cdot \frac{f(x)}{g(x)} \right] = \lim_{x\to c} g(x) \cdot \lim_{x\to c} \frac{f(x)}{g(x)} = 0 \cdot L = 0,$$

which contradicts our assumption that $l \neq 0$. □

3 CONCLUSIONS

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A Caveat for the TeX Expert.

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List of Tables

Table 1: Frequency of Special Characters

Non-English or Math	Frequency	Comments
Ø	1 in 1,000	For Swedish names
π	1 in 5	Common in math
$	4 in 5	Used in business
Ψ_1^2	1 in 40,000	Unexplained usage

Table 2: Some Typical Commands

Command	A Number	Comments
`\author`	100	Author
`\table`	300	For tables
`\table*`	400	For wider tables

Big Data Applications in the Hospitality Sector

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ABSTRACT

This paper focuses on how big data is used in the hotel industry for better customer satisfaction, marketing effectiveness and yield management using customer data for segmentation and predictive analyses.

1 CONCLUSIONS

This is the conclusion.[1]

ACKNOWLEDGMENTS

Acknowledgements

REFERENCES

[1] Gregor V Laszewski. 2017. test. (2017).

Optimizing Mass Transit Bus Routes with Big Data

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ABSTRACT

This paper provides a sample of a LaTeX document which conforms, somewhat loosely, to the formatting guidelines for ACM SIG Proceedings.

KEYWORDS

i523, hid225, LaTeX, public tranist, route optimization

1 INTRODUCTION

The *proceedings* are the records of a conference. ACM seeks to give these conference by-products a uniform, high-quality appearance. To do this, ACM has some rigid requirements for the format of the proceedings documents: there is a specified format (balanced double columns), a specified set of fonts (Arial or Helvetica and Times Roman) in certain specified sizes, a specified live area, centered on the page, specified size of margins, specified column width and gutter size[1].

ACKNOWLEDGMENTS

The authors would like to thank Prof..

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Big Data Applications in Electric Power Distribution

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ABSTRACT

Now-a-days, the process of storing the power measurements have changed. Conventional meters are replaced by the smart meters. New distribution management systems like SCADA and AMI are implemented to monitor power distribution. These smart meters record the readings and communicate the data to the server. However, these systems are designed to generate the readings very frequently i.e., 15 minutes to an hour. Upon that, smart meters are being deployed at every possible location to improve the accuracy of the data. This advancements in electric power distribution system results in enormous amounts of data which requires advance analytics to process, analyse and store data. This paper discusses about the implementation of Big Data technologies, challenges of implementing Big Data in Electric Power Distribution Systems. [1]

KEYWORDS

Big Data, Power Distribution,Smart Power

1 INTRODUCTION

Volume of data is increasing. According to forbes, it is said that, worldfis data utilization will increase to 44 zettabytes from the current utilization of 4.4 zettabytes. To process this data, Big Data analytics will be useful. But, instantiating a big data architecture is not easy task.

In electrical Power Distribution industry, data deluge is picking its pace. The data which was recorded for month, is now being noted for very small intervals. This quadruples the amount of data that should be process. There is a lot of potential work to be put in for designing a good Big Data architecture to process and analyse this data. Most of the power generation units are developing their infrastructure to support these designs.

1.1 Data Sources

Smart meters which are placed at customerfis vicinity will record the consumption of a specific group of customersfi. This data can be used to analyse the behaviour of customer for certain circumstances of weather and environment.

Distribution systems which manage the distribution of power, generate large amount of data related to voltages and currents at various levels of distribution. This data is very important in analysing the load level and demand for the distribution circle.

Power measuring units at generation. This data is used to analyse the behaviour of generator and amount of power generation that will be required to supply enough power. This data will be used to decide the functioning of generators.

Old market data will be used to analyse the pricing and marketing strategies. These data is more focused on users and their behaviour.

1.2 4 v's in Big Data in Power Distribution System

Volume: The data is periodically generated by many data sources like smart meters, machines and other appliances. Variety: Each data source in electric power distribution system is explicit to each other. Each source has its own frequency of data generation and its own method of data generation. Thus, the data is heterogenous. Velocity: is the speed at which the data is available for the end user. Veracity: It deals with the correctness of the data. As all the data collected by sensors, meter tend to have various losses, correction algorithms should be defined to find the accurate data. Their might be chances for data transfer losses.

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My First paper

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ABSTRACT

This paper edit by zzc

KEYWORDS

info523 big data

1 INTRODUCTION

this is the introduction

2 THE BODY OF THE PAPER

this is the body of the paper

3 CONCLUSIONS

This is the conclusion

ACKNOWLEDGMENTS

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REFERENCES

My great Big Dat Paper

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ABSTRACT

THIS IS AN ABSTRACT

KEYWORDS

ACM proceedings, LaTeX, text tagging

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3 CONCLUSIONS

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ACKNOWLEDGMENTS

The authors would like to thank Dr. Yuhua Li for providing the matlab code of the *BEPS* method.

The authors would also like to thank the anonymous referees for their valuable comments and helpful suggestions. The work is supported by the National Natural Science Foundation of China under Grant No.: 61273304 and Young Scientsts' Support Program (http://www.nnsf.cn/youngscientsts).

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Using Big Data for Fact Checking

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ABSTRACT

This paper intends to discuss how Big Data can be used to spot fake news, bad data used by politicians, advertisers, and scientists.

KEYWORDS

Big Data, Fact checking

1 INTRODUCTION

Big Data can be used to spot fake news, bad data used by politicians, advertisers, and scientists.

2 CONCLUSIONS

Add a conclusion here

3 REFERENCES

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ACKNOWLEDGMENTS

I thank all the people who made this possible

REFERENCES

Big Data Analytics in Sports - Soccer

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ABSTRACT

The aim of this paper is to provide an understanding as to how big data is playing a huge role in Football clubs helping them scout players.

KEYWORDS

Big Data, Soccer , Scouting

1 INTRODUCTION

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Big Data Applications in Media and Entertainment Industry

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ABSTRACT

This paper demonstrates the growth of big data and its various applications in media and entertainment industry. We showcases the rapid surge of big data and the increasing need for big data technologies. We also describes the problems that come with big data and its challenges in the industry. We then present various utilization of big data and why big data is important in the advancement of media and entertainment industry.

KEYWORDS

Big Data, Media, Entertainment Industry, Technology

1 INTRODUCTION

"2013 is the first year known as the beginning of big data, the world officially enter the era of big data. But big data is not clearly defined, until now, except for large enterprise data also have different definitions, such as Wanda defines the big data as DIKW hierarchical model, that is, Data, Knowledge and wisdom" [7].

"The era of big data is not coming; it is here. The birth and growth of big data was the defining characteristic of the 2000s. As obvious and ordinary as this might sound to us today, we are still unraveling the practical and inspirational potential of this new era. Google processes over 20 petabytes of data a day (a little less than half the entire written works of mankind from the beginning of recorded history in all languages). In addition to collecting and searching for more information, the technologies that allow us to capture and interpret that data are improving every time we blink. Something as simple as a snapshot has become a data collection event" [4].

"Big Data is about the growing challenge that organizations face as they deal with large and fast-growing sources of data or information that also present a complex range of analysis and use problems. Big Data technologies describe a new generation of technologies and architectures, designed to economically extract value from very large volumes of a wide variety of data, by enabling high-velocity capture, discovery, and/or analysis" [5].

"IDC, International Data Corporation, believes that organizations that are best able to make real-time business decisions using Big Data streams will thrive, while those that are unable to embrace and make use of this shift will increasingly find themselves at a competitive disadvantage in the market and face potential failure. This will be particularly true in industries experiencing high rates of business change and aggressive consolidation" [5].

"New data sources for Big Data include industries that just recently began to digitize their content. In virtually all of these cases, data growth rates in the past five years have been near infinite, since in most cases it started from zero. The media and entertainment industry moved to digital recording, production, and delivery in the past five years and is now collecting large amounts of rich content and user viewing behaviors" [5].

"The problem with the massive data collection and distribution system we have created is: big data is a big mess. Most of the data we capture in our daily lives just sits around, cluttering up storage space on our devices and slowing down our connections" [4].

"Under the era of big data, the traditional TV media are facing opportunities and challenges, how to deal with challenges and to seize the opportunity is the traditional TV media should concern. Comparison to the Traditional TV media, network TV and new media, the biggest advantage is that the traditional TV media have high-quality TV content, and the strong support of national policy. Traditional TV media itself has a lot of data, but traditional media did not make good use of these data that has been the impact of new media" [7].

2 APPLICATIONS IN MEDIA AND ENTERTAINMENT INDUSTRY

"Social media solutions such as Facebook, Foursquare, and Twitter are the newest new data sources. A number of new businesses are now building Big Data environments, based on scale-out clusters using power-efficient multicore processors like the AMD Opteron 4000 and 6000 Series platforms, that leverage consumers' (conscious or unconscious) nearly continuous streams of data about themselves (e.g., likes, locations, opinions). Thanks to the "network effect" of successful sites, the total data generated can expand at an exponential rate. One company IDC spoke with collected and analyzed over 4 billion data points (Web site cut-and-paste operations) in its first year of operation and is approaching 20 billion data points less than a year later" [5].

"Some of the most interesting, but also most challenged, industries when it comes to Big Data adoption will be utilities and content service providers (e.g., cable TV, mobile carriers). These communities (with assists from related companies such as video gaming system and appliance manufacturers) are building out Big Data generating fabrics. Their opportunity now is to figure out how to handle and then do something with all that data, despite the fact that from a cultural standpoint data guardianship and use were much less in the past" [5].

"An additional hurdle for these industries is that it isn't enough to just get the "answers" from Big Data platforms. They also need to implement automated response systems (e.g., automated power management or "in game" ad placement) that will ultimately be the foundation of their business models" [5].

"We would like to offer a set of rules for the new data world: 1) big is not enough, and 2) it is neither necessary nor practical to fix every piece of data we have collected as a species into some particular

order" [4].
"We are already capturing massive quantities of data about our entertainment. Take, for example, Supernatural, an American horror series, created by Eric Kripke in 2005.1 Now in its seventh season, it has generated roughly 112 hours of footage. So we have a lot of pixels, yes, but we also have much more. We have every action of every character; every line of dialogue; a history of when, where, and how often everyone dies. Because all of that information is data, what we actually have, in and around those 112 hours of pixels, is a map to the world of Supernatural, and the characters inside it" [4].
"Today, all of that footage and all of that information is locked away in old style data collections: fixed and unwieldy. But if we can store all that information in a system, modeled more on biology than books, and apply our significant and increasing processing power to analyze and respond to the world, rather than just move it around mechanically, then we have the possibility of generating and interacting with the world and the characters of Supernatural (or possibly even a story you like). This requires computational intelligence, not a Google search. It is not the ability to hunt down a single piece of data in the massive haystack of global information but rather the ability to make something new and interesting emerge out of that data" [4].
"In the era of big data, mass user behavior data is used to model predictions. Where big data are the personal recommendation system in a typical application of radio and television, The traditional approach is based on the user's clicking behavior, to analyze the user's preferences, then recommend related programs. But now in order to recommend more accurate, use not just the set-top box data for statistical analysis, but also dig out the sharing behavior on the user network along with the comment feature behavior and other behaviors, in order to better characterize user portrait. In the era of big data, television media should be the depth of excavation and analysis of user information on the user's viewing behavior , the initiative to understand what users really want to see, in order to provide better services for television users. In other countries, the television media successful application of large data typical case is the "house of cards", which analyzes the form of selection and decision-making with actors play using the big data" [7].
"Technically, the first to take in consideration is television media are capable of producing large amounts of data every day, how to integrate their data, define combing their data assets to create a connection between the television media and their users, effective analysis of audience preferences to realize customization. secondly the traditional TV media have with respect to network operators, the biggest advantage is that they have high-quality TV content, but how to use these high quality content effectively disseminated to users. in addition to drawing telecommunications powerful content communication technologies and outside network framework, also taking into account the characteristics of the television media itself" [7].
"The most important point that TV media can use big data technology is that television is the media itself has data, the data are the main source of set-top boxes, network management systems. To collect the data more widely, some companies such as Nielsen TV media can also take the technology to provide brain waves, using 32 sensors, acquisition frequency of 500 times / Sec, measurable indicators are mainly about emotional investment, triggering memories and attention. Therefore, data collection is more mature as it showed" [7].
"But the TV media data from multiple data sources and scattered, besides the internal data such as set-top box data, network management systems data, BOSS system, etc., as well as external data, such as online user behavior data, data integration is the primary challenge in television media big data applications. How TV media make internal data and external data streams to achieve mutual exchange, how to create their own big data, sort out their own data assets, which need the support by big data technology. And television media use Big Data technologies to meet the individual needs of the "precise communication", which can improve service quality, protection of cultural rights and interests of the public, the media TV plays disseminating information, building culture, guide public opinion, the responsibility to resist foreign cultural erosion at the same time, therefore more need to focus on high-tech applications" [7].

3 CONCLUSION

Put here an conclusion. Conclusions and abstracts must not have any citations in the section. [1] [2] [3] [6]

ACKNOWLEDGMENTS

The authors would like to thank Dr. Gregor von Laszewski for his support and suggestions to write this paper as well as Lee Yang for her proofreading on this paper.

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Big Data Analytics in Tourism Industry

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ABSTRACT

This paper focuses on how the tourism industry has been impacted by the development of the Internet and improvements in information and communication technologies and how big data analytic can influence tourism research.

KEYWORDS

Big data analytics, tourism

1 INTRODUCTION

this is my introduction [1].

2 CONCLUSIONS

This my conclusion.

ACKNOWLEDGMENTS

The authors would like to thank I523.

REFERENCES

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My great Big Dat Paper

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ABSTRACT

This paper provides a sample of a LaTeX document which conforms, somewhat loosely, to the formatting guidelines for ACM SIG Proceedings.

KEYWORDS

ACM proceedings, LaTeX, text tagging

1 INTRODUCTION

The *proceedings* are the records of a conference. ACM seeks to give these conference by-products a uniform, high-quality appearance. To do this, ACM has some rigid requirements for the format of the proceedings documents: there is a specified format (balanced double columns), a specified set of fonts (Arial or Helvetica and Times Roman) in certain specified sizes, a specified live area, centered on the page, specified size of margins, specified column width and gutter size [1].

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Big Data Application in Restaurant Industry

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ABSTRACT

This paper provides insight into how big data can be used in the restaurant industry. It also explores how big data can be collected and analyzed so that it helps restaurant industry to do better in profit margins and give their customer a great hospitality experience. This paper will try to find out current technologies and solutions available in big data processing for the restaurant industry. It will also focus on various challenges involved in using big data in the restaurant business. This paper is a review/research paper which considers information from various sources like articles, books and web to provide the information.

KEYWORDS

big data, restaurant, application, analytics

1 INTRODUCTION

Big data is revolutionizing the way business is getting conducted in various industries. The retailer like Amazon uses it to provide personalized buying suggestions and social networking site like LinkedIn uses it to connect more people. Question is, do we have big data available for the restaurant industry and how big data application is going to be beneficial. The restaurant industry is facing challenges like shrinking labor pool, moderate economic growth, costly labor, challenging profit margin, high competition, moderate sales growth and growing expectation from the customer on the dining experience, can big data application help overcome these challenges.[1]

2 BIG DATA FOR RESTAURANT/INGREDIENT

To understand how big data analytics will help, we first need to find out what are the data points present in the restaurant industry which can be considered as big data. As one of the V-variety of big data, the restaurant also has structured and unstructured data. Structured data is something which is getting generated inside the restaurant and unstructured data is something which is outside of the restaurant.

2.1 Structured Data

Structured data is well formatted, easy to understand and analyze. Restaurant POS(point of sale) system shows whatfis selling, where, and at what time[3]. Food and beverage cost, labor cost, product mix, rent cost are obvious data points. Raw material required for preparation, menu, ingredient consideration, meal preparation, product availability from the supplier, prices of products comes from the kitchen of the restaurant. Staffing schedule, table turnover, bar management, wages, salaries, tips, customer feedback is data. The number of time employee coming late, number of times drinks provided as comp due to server error is data.[2]

2.2 Unstructured Data

Unstructured data is un-formatted, difficult to gather and analyze. Data shared from social media like trends, retweets, shares, and comments categorize as unstructured data. Customer promotions, customer profile like age, gender, address, email, taste preference, favorite dish, various milestones like birthdate, anniversary etc, along with family information is also an unstructured data. Weather and traffic information also constitutes as an important data to consider. [2]

3 COLLECT BIG DATA/CONSUME

These various data attributes can be collected from the different system. Most of the data is generated inside the restaurant by the system like POS which captures all sales transactions. POS system can also break down sales by time, size of the party, menu items, and ingredients. The inventory provides information on suppliers, food, beverages, and gas and electricity bill. Payroll provides information on wages, salaries, employee schedule, and time off by the employees. Loyalty program and marketing promotions provides data regarding marketing of the restaurant.

Outside data can be gathered through the various applications like OpenTable, Facebook, Twitter, Yelp, TripAdvisor, Foursquare, Urbanspoon or Instagram, weather and traffic sites. Information can be gathered from customer like his favorite menu/drink item, favorite table, special request, allergies, liking to the presentation, feedback on ambiance, service and food. [2]

4 BIG DATA ANALYTICS

5 SOLUTION AND TOOLS AVAILABLE

6 REAL LIFE EXAMPLES/FLAVOURFUL IMPLEMENTATION

7 CHALLENGES OF USING BIG DATA

8 CONCLUSIONS

This paragraph will end the body of this sample document. Remember that you might still have Acknowledgments or Appendices; brief samples of these follow. There is still the Bibliography to deal with; and we will make a disclaimer about that here: with the exception of the reference to the LaTeX book, the citations in this paper are to articles which have nothing to do with the present subject and are used as examples only.

A HEADINGS IN APPENDICES

The rules about hierarchical headings discussed above for the body of the article are different in the appendices. In the **appendix** environment, the command **section** is used to indicate the start of each Appendix, with alphabetic order designation (i.e., the first is A, the second B, etc.) and a title (if you include one). So, if you need hierarchical structure *within* an Appendix, start with **subsection** as the highest level. Here is an outline of the body of this document in Appendix-appropriate form:

A.1 Introduction

A.2 The Body of the Paper

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A.2.2 Math Equations.

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A Caveat for the TEX Expert.

A.3 Conclusions

A.4 References

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My great Big Dat Paper

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ABSTRACT

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KEYWORDS

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Big Data Analytics for Municipal Waste Management

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ABSTRACT

As waste management becomes a greater concern for cities and municipalities around the world, big data analysis has the potential to not only help assess the current waste management strategies but also provide information that can be used to optimize the systems used in various institutions, local government, companies, etc.

KEYWORDS

Waste Management, Big Data, Local Government

1 INTRODUCTION

In the current fast paced society, as production of goods increases and new distribution chains constantly change, the production of disposed materials and goods, from now on called solid waste, has increased over the past ten years, going from around 0.64 kg per person per day of solid waste to approximately 1.2 kg per person per day, and it is expected to increase to about 1.42 kg. [**?**] this causes the problem of waste management to increase in complexity and magnitude.

Because of this, the different local governments and organizations have seen the need to develop regulations to control the different features, segments, processes? Of the action of disposal. From the moment the material is discarded until the moment the material reaches itfis ultimate destination: recycling plant or landfill. This set of systematic regulations is called solid waste management [**?**]

2 WASTE MANAGEMENT

The amounts of disposed material and itfis composition vary depending on the country, place and activity that is performed at the site where the waste is generated. [**?**] There are also important differences between the general composition of the waste generated in rural area and what is produced in urban area, the waste produced in the later is highlyu influenced by the culture and the practices of our modern society. [**?**] p47 to 63

For this reason, every process related to waste management-transportation, storing and final disposition, among others- must be engineered and tailored to fit the specific needs of each case.

In general, decisions can be classified as optimal, good, or fortuitous. [**?**] and this can be applied to Waste Management.

Having that Good decision-making is mostly based on experience, comparison of elements and trial and error, and that fortuitous decision-making have no scientific base; one must always try to solve the problem -in this case waste management related- with Optimal Decision making, that requires techniques and technologies provided by other fields. [**?**]

3 BIG DATA AND WASTE MANAGEMENT

By collecting and storing large volumes of data related to types of waste, quantities, periodicity, and composition; usually from independent sources. Big data can be interpreted in a way that allows the different actors that intervene in Waste Management to make Optimal Decisions. [**?**]

3.1 Opportunities for Waste Management Optimization

The process of solving a math program requires a large number of calculations and is, therefore, best performed by a computer program. [**?**]

4 OPPORTUNITIES FOR WASTE MANAGEMENT OPTIMIZATION

4.1 Statistics and Waste Management

There are many data analysis methods that are used when studying waste management, but the two most popular are PCA and PLS1. [**?**]

Lingo is a mathematical modeling language designed particularly for formulating and solving a wide variety of optimization problems including linear programing. Lingo optimization software uses branch and bound methods to solve problems of this type. [**?**]

4.2 GIS Analytics

When it comes to Geographical Information Systems (From now on GIS) There are multiple software and hardware options in the market. From paid software like ArcGIS to Open and free software like GVSIG, there are solutions that can help interpret large data sets, apply statistics and algorithms of different kinds and display them in a way that make reference to a geographical space.

/cite shahrokni2014big

The second category of studies focuses on minimizing transportation of waste collection through optimal routing algorithms. For example Kim et al [18] use two methods to calculate an optimal set of routes, the ffirst being Solomonfis insertion algorithm, the second being a clustering algorithm. Their aim was to minimize the driven distance, as well as to balance the workload. At the same time, the constraint of legally prescribed lunch breaks (so called time-window problem) had to be satisffied. McLeod and Cherrett [19] suggestedarouteoptimizationforthreeareasandconnectedwaste companies in North Hampshire (UK). By applying simple rerouting, sharing of routes between the 3 areas and adding vehicle depots at the waste disposal sites, they estimated annual savings as large as 10,000 km for the studied routes (this covers one ffifth of all routes in North Hampshire). Another study performed by Wy, Kim and Kim [20] studied

a routing algorithm for waste collection using roll-on/roll-off containers, again while factoring in the time windows. Buhrkal, Larsen and Ropke [21] were one of the ffirst to suggest the environmental importance of optimizing waste collection itineraries. They utilized an adaptive large neighborhood search algorithm, and a clustering method and their scope was residential waste collection. Depending on the computation time, using the actual collection points and lunch time windows, the savings amounted to 13 percent average. With larger time windows and better starting conditions, heuristics with a distance reduction of up to 45

/cite shahrokni2014big

Many data analysis methods are used when studying waste management, but the two most popular are PCA and PLS1. [**?**]

5 CONCLUSIONS

There are different tools to optimize the different waste management practices and to improve the information available for decision makers...

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Internet of Things (IoT) alliance with Big Data

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ABSTRACT

This paper provides an introduction to Internet of Things (IoT) and how Big Data can effectively improve IoT process.

KEYWORDS

Internet of Things, IoT, Big Data, Data Science

1 INTRODUCTION

The Internet of things (**IoT**) is the network of physical devices, vehicles, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange data[5]. Devices of all types - cars, manufacturing equipment, medical devices and more - have become smarter, opening up the need for their connectivity with the internet. Today, over 50% of IoT activity is centered in manufacturing, transportation, smart city, consumer applications like home automation and wearable gadgets, but within five years all industries will have rolled out IoT initiatives. **Gartner, Inc**. forecasts that 8.4 billion connected things will be in use worldwide in 2017 and will reach 20.4 billion by 2020[4].

2 IOT INTUITION

The rise of IoT changes everything by enabling **smart** things: smart products - cars, airplanes, trains and smart environments - cities, hospitals, schools and stores. Broadly speaking, two kinds of IoT are emerging: **Consumer IoT** and **Industrial IoT**. Products such as Apple Watch, Fitbit and Home Automation - TV, thermostats, alarm system, etc. are some of the examples of Consumer IoT. Industrial IoT examples include: manufacturing equipment and medical devices.

A few examples of IoT include:

Track your activity levels - Using your smartphone's range of sensors (Accelerometer, Gyro, Video, Proximity, Compass, GPS, etc) and connectivity options (Cell, WiFi, Bluetooth, NFC, etc) you have a well equipped Internet of Things device in your pocket that can automatically monitor your movements, location, and workouts throughout the day.

Get most out of your medication - The Proteus ingestible pill sensor is powered by contact with your stomach fluid and communicates a signal that determines the timing of when you took your meds and the identity of the pill. This information is transferred to a patch worn on the skin to be logged for you and your doctor's reference. Heart rate, body position and activity can also be detected.

Rolls-Royce is using Azure Stream Analytics and Power BI to link up sensor data from its engines with more contextual information like air traffic control, route data, weather and fuel usage to get a fuller picture of the health of its aircraft engines.

Smart Homes - A smart home is one in which devices have the capability to communicate with each other, as well as with their environment and the Internet. Smart homes enable owners to customize and control their home environments for increased security and efficient energy management. There are already hundreds of IoT technologies available to monitor and build smart homes.

Smart Cities - Smart surveillance, safer and automated transportation, smarter energy management systems and environmental monitoring are all examples of IoT applications for smart cities.

3 NEED OF BIG DATA

The true value of IoT is not in the internet connected devices themselves; the value lies in making context-aware and relevant data and turning the result into enterprise-grade, tangible, **actionable** business insights. The IoT and big data are clearly intimately connected: billions of internet-connected things will, by definition, generate massive amounts of data. As the Things turn more digital, IoT will analyze - variety sources (structured and unstructured), types of data (text, audio, video, image and binary) and respond intelligently in real time.

Big data, meanwhile, is characterized by **four Vs** - volume, variety, velocity and veracity[3]. That is, big data comes in large amounts (volume), with a mixture of structured, semi-structured and unstructured data (variety), arrives at (often real-time) speed (velocity) and can be of uncertain provenance (veracity). Such information is unsuitable for processing using traditional SQL-queried relational database management systems (RDBMSs), which is why a constellation of alternative tools – notably Apache's open-source **Hadoop** distributed data processing system, various **NoSQL** databases and a range of business intelligence platforms - have evolved to serve such a complex process.

Big Data is being generated at all times. Every digital process and social media exchange produces it. Systems, sensors and mobile devices transmit it. Much of this data is coming to us in an unstructured form, making it difficult to put into structured tables with rows and columns. To extract insights from this complex data, Big Data projects often rely on cutting edge analytics involving data science and machine learning. Computers running sophisticated algorithms can help enhance the veracity of information by sifting through the noise created by Big Data's massive volume, variety, and velocity.

4 ALLIANCE WITH CLOUD AND BIG DATA

To scale the needs of IoT, the strategy should include infrastructure and applications that process machine and sensor data, and leverage it accordingly. At the moment, IoT platforms are often custom-built functional architecture. Enterprises that take the first step into this new market should look for interoperability between existing systems and a new IoT operating environment.

The building blocks of the IoT platform must include:

Things - A major part of the IoT is not so much about smart things (devices), but about sensors and actuators. **Sensors** measure physical inputs and transform them into raw data; **actuators** act on the signal from the sensors and convert it into output, which is then digitally storable for access and analysis. These tiny innovations can measure anything from temperature, force, flow and position, to light intensity and then can be attached to everything from smart phones to the medical devices and then record & send data back into the cloud. Smart-phone would not have been smart if it does not have an array of sensors embedded in it[6]. A typical smart-phone is equipped with five to nine sensors, depending on the model.

Network Connectivity in the devices is achieved through: wireless/wired, Wi-Fi, Bluetooth, ZigBee, VPN and Cellular 2G/3G/LTE/4G. Thread as an alternative for home automation applications and Whitespace TV technologies being implemented in major cities for wider area IoT-based use cases. Depending on the application, factors such as range, data requirements, security, power demands and battery life will dictate the choice of one or some form of combination of the technologies. In March 2015, the Internet Architecture Board - a group within the Internet Society that oversees the technical evolution of the internet - released a guide to IoT networking. This outlined four common communication models used by IoT smart objects: Device-to-Device, Device-to-Cloud, Device-to-Gateway, and Back-End Data-Sharing[1].

Collaboration and Security - Human and organizational behavior is critical in realizing the value of new approaches, and it is particularly important in shifting an organization to demonstrate clearly what will change, how it affects people, and what they stand to gain from IoT applications. Tons of collected IoT data could easily contain sensitive information about people and operations, and can even lose the control of critical systems. Beyond protecting personal privacy and business secrets, as more systems become automated, the risk of attacks becomes both more likely and more impactful.

Devices themselves should be secured, as should operating systems, networks, and every other exposed piece of technology along the way. The roles of users, administrators, and managers should be individually defined with appropriate access and strong authentication embedded in the design. A multi-layered approach to security is essential, and it should have checks and balances to reinforce protection and, if necessary, diagnose any breaches. For the IoT to work effectively, all the challenges around regulatory, legal, privacy and cybersecurity must be addressed; there needs to be a framework within which things (devices) and applications can exchange data securely over wired or wireless networks. To address these challenges, one key player, **OneM2M** issued Release 1, a set of 10 specifications covering requirements, architecture, Application Programming Interfaces (API) specifications, security solutions and mapping to common industry protocols[2].

Cloud - The cloud brings needed agility, scalability, storage, processing, global reach and reliability to an IoT platform. Needed scalability can be achieved by using (1) Cloud Centric IoT - Good choice for low-cost things where data can easily be moved, with few ramifications (2) Edge Analytics - Ideal for things producing large volumes of data that are difficult, costly or sensitive to move (3) Distributed Mesh Computing - **Future-ready** multi-party things automatically collaborate with privacy intact.

Big Data Analytics - The resulting flood of IoT sensor data must be understood and made actionable in the moment and over the long term. These data points will include structured data, unstructured data, and structured time series data, as well as a variety of analytical methods. Structured data might come from ERP systems and relational databases, such as supply chain and parts listings for automobile manufacturing. Exact specifications of each component are captured as transactional updates in tightly defined fields (part number, production lot, factory, etc.). Later the data may be extracted and joined with looser, unstructured text data like service records notes from car dealerships. And a time element may come in also as the service dates for oil changes and other periodic maintenance occur. Each data type introduces more information, but combined together will yield the secret of when a part failure is happening, help diagnose the origin of the problem, and suggest a preventative maintenance fix.

Big data, in the context of the IoT, refers to analog inputs being converted to digital data and analyzed, and resulting in a response going back the other direction. Unlike some big data applications, the inputs should be at least semi-structured, but the sheer quantities and immediateness will raise other hurdles. Some analytics may need to be performed at the edge, some in the data center, and some in a cloud environment, depending on the trade-off of speed versus depth.

5 CONCLUSION

IoT is becoming disruptive yet inevitable for companies to welcome it. Creating a connected IoT ecosystem that maximizes business value, we need to collaborate: technologies, data, process, insight, action and people. The **T** of IoT is clearly important, but too often, it is the only area of focus when examining IoT in business. The Things are only the mean to an end as entities that can capture data measuring physical conditions or sometimes as actuators to affect the system. Rest of the systems need to be instrumented to leverage the data: communicating it to the right place for action - whether the cloud, data center, or edge - and then using analytics to understand data patterns and craft a response to fix or optimize. The goal of a connected IoT ecosystem is to get the most out of the Internet of Your Things in Your Context. Innovative organizations are starting to put this to use today.

ACKNOWLEDGMENTS

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Big Data and Data Visualization

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ABSTRACT

This paper will provide an overview on how analytical findings of Big Data solutions can be visualized using various visualization technologies

KEYWORDS

i523

1 INTRODUCTION

Big data is widely used technology to consume huge amount of data. While there are various technologies available to process this data it is very important to have interactive, intuitive, user friendly data visualizations in place so that decision makers, business users will have clear understanding of findings of big data solutions. These visualizations will make help us to make informed decision looking at various trends over the period of time.

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An Overview of Big Data Applications in Mental Health Treatment

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ABSTRACT

Mental health treatment presents with complex informational challenges, which could be effectively tackled with big data techniques. However, as researchers and treatment providers explore these applications, they find a lack of infrastructure and ethical concerns hamper their progress. [? ? ? ? ? ?].

KEYWORDS

Mental Health Treatment

1 INTRODUCTION

Big Idea: Mental Illness is a big societal problem, which could benefit from a big data solution.

Mental health difficulties are a common problem across the United States, and worldwide. Mental illness of some kind was prevalent among 17.9 % of Americans in 2015, and of that number 4% experienced serious functional impairment as a result [?]. A 2014 meta-analysis study estimated that the worldwide prevalence of mental illness was 17.6% and that 29.2% of the world population would experience mental illness at some point during their life [?].

The effects of these disorders on individuals and societies is costly. The US Center for Disease Control and Prevention estimated that 36,035 people died during a suicide attempt in 2008, and that 666,000 sought emergency room care for self harming behavior [?]. In 2013, the Social Security Administration reported that 1,947,775 persons received social security/disability benefits for either a mood or psychotic disorder, which is around 19% of all recipients [?]. It is estimated that mental health issues had a $100 billion cost on the US economy in 2002 [?] (more recent stats), and in 2015 there were over 12,000 mental health treatment facilities in the US [?].

1.1 The State of Mental Health Treatment

Brief summary of Mental Health Treatment Big picture impact on population and economy:

Goal of mental health treatment Techniques

Brief summary of Big Data Big picture impact on everyday life and economy Goal of Big data analytics Techniques

Thesis

2 BIG DATA APPLICATIONS IN MENTAL HEALTH TREATMENT

Introduce concept of different levels of maturity

2.1 Mature Applications

2.2 Developing Applications

2.3 Initiatives

3 CONCLUSIONS

3.1 Barriers

3.2 Future Directions

form:

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2

Big Data Platforms as a Service

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ABSTRACT

This paper uses an industry example of a large pharmaceutical client to explore the problems faced to implementing big data platform solutions and the benefits these solutions offer once in use.

KEYWORDS

Big Data, Platform, Cloud Architecture

1 INTRODUCTION

Most pharmaceutical companies have adopted one or many Laboratory Information Management Systems (LIMS) and/or Electronic Laboratory Notebooks (ELN). These systems are often implemented as standalone systems within a single Research and Development (R&D) group or even within a single laboratory. A problem seen in large- or mid-sized pharmaceutical companies is that different research groups within the same organization often implement different LIMS or ELN. This severely restricts data sharing and reuse between groups which leads to many problems including the same experiment being run multiple times between different groups, regulatory inefficiencies in tracking sample use and storage, and bottle necked development cycles due to missing data.

One of the emerging strategies to combat the problems arising from isolated systems is to combine systems using cloud computing. Platform as a Service (PaaS) provides an environment for the development and execution of applications and software tools. The platform is the heart of a cloud computing infrastructure that enables software on-top as well as data created from such software to be accessed and used my a multitude of users[1].

This review seeks to outline the benefits and challenges of using a PaaS approach to share and regulate R&D data within a large pharmaceutical company that has already implemented numerous laboratory systems.

2 IMPORTANCE OF PLATFORMS

Many organizations struggle with the aim of sharing data and processing tools among researchers. SaaP provides a method of better resource utilization while reducing maintenance costs[2].

3 IMPLEMENTING PLATFORMS

The overarching concern with storing data outside of the organization is security. Numerous methods have been developed to assure cloud security such as integrated stacks used by Google and Microsoft Azure and Service Level Agreements (SLAs)[3].

4 PLATFORMS AND BIG DATA

ACKNOWLEDGMENTS

The authors would like to thank Dr. Gregor Von Laszewski and Teaching Assistants Saber Sheybani and Miao Jiang.

REFERENCES

[1] [n. d.].
[2] [n. d.]. ([n. d.]).
[3] [n. d.]. ([n. d.]).

My great Big Dat Paper

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ABSTRACT

This paper provides a sample of a LaTeX document which conforms, somewhat loosely, to the formatting guidelines for ACM SIG Proceedings.

KEYWORDS

i523

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Big Data for Edge Computing

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Put here an introduction about your topic. We just need one sample refernce so the paper compiles in LaTeX so we put it here [1].

2 CONCLUSION

Put here an conclusion. Conlcusions and abstracts must not have any citations in the section.

ACKNOWLEDGMENTS

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Big Data Analytics in Biometric Identity Management

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ABSTRACT

An understanding how biometrics is changing rapidly, and with it, both the size and scope of data being collected. From 2-print to 10-print, iris to facial recognition, the demand for both data intensive processes and rapid matching have grown exponentially, a case study in big data if there ever was one.

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Big Data Analytics for Municipal Waste Management

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ABSTRACT

As waste management becomes a greater concern for cities and municipalities around the world, big data analysis has the potential to not only help assess the current waste management strategies, but also provide information that can be used to optimize the systems used in various institutions, local government, companies, etc.

KEYWORDS

Waste Management, Big Data, Local Government

1 INTRODUCTION

Concept of waste managementfi

Solid Waste Management (SWM) is a set of consistent and systematic regulations related to control generation, storage, collection, transportation, processing and land filling of wastes according to the best public health principles, economy, preservation of resources, aesthetics, other environmental requirements and what the public attends to [1]

Managing solid waste is one of the most essential services which often fails due to rapid urbanization along with changes in the waste quantity and composition. Quantity and composition vary from country to country making them difficult to adopt for waste management system which may be successful at other places. Quantity and composition of solid waste vary from place to place [3]

2 OPPORTUNITIES FOR WASTE MANAGEMENT OPTIMIZATION

By collecting and storing data related to types of waste, quantities, periodicity and composition.

2.1 GIS Analytics

3 STATISTICS AND WASTE MANAGEMENT

While rural area usually generates organic and biodegradable, urban area produces waste influenced by culture and practices of society. [3] p47 to 63

There are many data analysis methods that are used when studying waste management, but the two most popular are PCA and PLS1. [2]

decision makers should distinguish between optimal, good, and fortuitous decision-making. In the optimal decision making, one can solve the optimal problem using the techniques available in other fields. In this solution method, generally some constraints (criteria) are consid- ered, where the function(s) is to be optimized through applying some methods. Good decision-making is done based on experience, trial and error or comparison between different options of the integrated SWM. Although it is possible to choose decisions close to the optimal state using this decision-making method, today these methods are not applicable due to increased number of different combinations in the decision-making process. In the fortuitous decision-making, since decisions are made with no scientific base, so the results are not acceptable [1]

The process of solving a math program requires a large number of calculations and is, therefore, best performed by a computer program. Lingo is a mathematical model- ing language designed particularly for formulating and solving a wide variety of optimization problems including linear programing. Lingo optimization software uses branch and bound methods to solve problems of this type. [1]

4 CONCLUSIONS

Working on this

Generated by bibtex from your `.bib` file. Run latex, then bibtex, then latex twice (to resolve references) to create the `.bbl` file. Insert that `.bbl` file into the `.tex` source file and comment out the command `\thebibliography`.

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[3] R. Chandrappa and J. Brown. 2012. *Solid Waste Management: Principles and Practice*. Springer Berlin Heidelberg, Berlin. https://books.google.com/books?id=kUOwuAAACAAJ

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ACM proceedings, LaTeX, text tagging

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2 THE BODY OF THE PAPER

Typically, the body of a paper is organized into a hierarchical structure, with numbered or unnumbered headings for sections, subsections, sub-subsections, and even smaller sections. The command `\section` that precedes this paragraph is part of such a hierarchy. LaTeX handles the numbering and placement of these headings for you, when you use the appropriate heading commands around the titles of the headings. If you want a sub-subsection or smaller part to be unnumbered in your output, simply append an asterisk to the command name. Examples of both numbered and unnumbered headings will appear throughout the balance of this sample document.

Because the entire article is contained in the **document** environment, you can indicate the start of a new paragraph with a blank line in your input file; that is why this sentence forms a separate paragraph.

2.1 Type Changes and *Special* Characters

We have already seen several typeface changes in this sample. You can indicate italicized words or phrases in your text with the command `\textit`; emboldening with the command `\textbf` and typewriter-style (for instance, for computer code) with `\texttt`. But remember, you do not have to indicate typestyle changes when such changes are part of the *structural* elements of your article; for instance, the heading of this subsection will be in a sans serif[1] typeface, but that is handled by the document class file. Take care with the use of the curly braces in typeface changes; they mark the beginning and end of the text that is to be in the different typeface.

You can use whatever symbols, accented characters, or non-English characters you need anywhere in your document; you can find a complete list of what is available in the *LaTeX User's Guide* [**?**].

2.2 Math Equations

You may want to display math equations in three distinct styles: inline, numbered or non-numbered display. Each of the three are discussed in the next sections.

2.2.1 Inline (In-text) Equations. A formula that appears in the running text is called an inline or in-text formula. It is produced by the **math** environment, which can be invoked with the usual `\begin . . . \end` construction or with the short form `$ . . . $`. You can use any of the symbols and structures, from α to ω, available in LaTeX [**?**]; this section will simply show a few examples of in-text equations in context. Notice how this equation:
$\lim_{n\rightarrow\infty} x = 0$,
set here in in-line math style, looks slightly different when set in display style. (See next section).

2.2.2 Display Equations. A numbered display equation—one set off by vertical space from the text and centered horizontally—is

[1] Another footnote here. Let's make this a rather long one to see how it looks. Footnotes must be avoided.

produced by the **equation** environment. An unnumbered display equation is produced by the **displaymath** environment.

Again, in either environment, you can use any of the symbols and structures available in LaTeX; this section will just give a couple of examples of display equations in context. First, consider the equation, shown as an inline equation above:

$$\lim_{n\rightarrow\infty} x = 0 \tag{1}$$

Notice how it is formatted somewhat differently in the **displaymath** environment. Now, we'll enter an unnumbered equation:

$$\sum_{i=0}^{\infty} x + 1$$

and follow it with another numbered equation:

$$\sum_{i=0}^{\infty} x_i = \int_{0}^{\pi+2} f \tag{2}$$

just to demonstrate LaTeX's able handling of numbering.

2.3 Citations

Citations to articles [? ? ? ?], conference proceedings [?] or maybe books [? ?] listed in the Bibliography section of your article will occur throughout the text of your article. You should use BibTeX to automatically produce this bibliography; you simply need to insert one of several citation commands with a key of the item cited in the proper location in the `.tex` file [?]. The key is a short reference you invent to uniquely identify each work; in this sample document, the key is the first author's surname and a word from the title. This identifying key is included with each item in the `.bib` file for your article.

The details of the construction of the `.bib` file are beyond the scope of this sample document, but more information can be found in the *Author's Guide*, and exhaustive details in the *LaTeX User's Guide* by Lamport [?].

This article shows only the plainest form of the citation command, using `\cite`.

Some examples. A paginated journal article [?], an enumerated journal article [?], a reference to an entire issue [?], a monograph (whole book) [?], a monograph/whole book in a series (see 2a in spec. document) [?], a divisible-book such as an anthology or compilation [?] followed by the same example, however we only output the series if the volume number is given [?] (so Editor00a's series should NOT be present since it has no vol. no.), a chapter in a divisible book [?], a chapter in a divisible book in a series [?], a multi-volume work as book [?], an article in a proceedings (of a conference, symposium, workshop for example) (paginated proceedings article) [?], a proceedings article with all possible elements [?], an example of an enumerated proceedings article [?], an informally published work [?], a doctoral dissertation [?], a master's thesis: [?], an online document / world wide web resource [? ? ?], a video game (Case 1) [?] and (Case 2) [?] and [?] and (Case 3) a patent [?], work accepted for publication [?], 'YYYYb'-test for prolific author [?] and [?]. Other cites might contain 'duplicate' DOI and URLs (some SIAM articles) [?]. Boris / Barbara Beeton: multi-volume works as books [?] and [?].

A couple of citations with DOIs: [? ?].

Online citations: [? ? ?].

We use jabref to manage all citations. A paper without managing a bib file will be returned without review. in the bibtex file all urls are added to rfernces with the *url* filed. They are not to be included in the *howpublished* or *note* field.

2.4 Tables

Because tables cannot be split across pages, the best placement for them is typically the top of the page nearest their initial cite. To ensure this proper "floating" placement of tables, use the environment **table** to enclose the table's contents and the table caption. The contents of the table itself must go in the **tabular** environment, to be aligned properly in rows and columns, with the desired horizontal and vertical rules. Again, detailed instructions on **tabular** material are found in the *LaTeX User's Guide*.

Immediately following this sentence is the point at which Table 1 is included in the input file; compare the placement of the table here with the table in the printed output of this document.

[Table 1 about here.]

To set a wider table, which takes up the whole width of the page's live area, use the environment **table*** to enclose the table's contents and the table caption. As with a single-column table, this wide table will "float" to a location deemed more desirable. Immediately following this sentence is the point at which Table 2 is included in the input file; again, it is instructive to compare the placement of the table here with the table in the printed output of this document.

[Table 2 about here.]

It is strongly recommended to use the package booktabs [?] and follow its main principles of typography with respect to tables:

(1) Never, ever use vertical rules.
(2) Never use double rules.

It is also a good idea not to overuse horizontal rules.

2.5 Figures

Like tables, figures cannot be split across pages; the best placement for them is typically the top or the bottom of the page nearest their initial cite. To ensure this proper "floating" placement of figures, use the environment **figure** to enclose the figure and its caption.

This sample document contains examples of `.eps` files to be displayable with LaTeX. If you work with pdfLaTeX, use files in the `.pdf` format. Note that most modern TeX systems will convert `.eps` to `.pdf` for you on the fly. More details on each of these are found in the *Author's Guide*.

[Figure 1 about here.]

[Figure 2 about here.]

As was the case with tables, you may want a figure that spans two columns. To do this, and still to ensure proper "floating" placement of tables, use the environment **figure*** to enclose the figure and its caption. And don't forget to end the environment with **figure***, not **figure**!

[Figure 3 about here.]

[Figure 4 about here.]

2.6 Theorem-like Constructs

Other common constructs that may occur in your article are the forms for logical constructs like theorems, axioms, corollaries and proofs. ACM uses two types of these constructs: theorem-like and definition-like.

Here is a theorem:

THEOREM 2.1. *Let f be continuous on $[a, b]$. If G is an antiderivative for f on $[a, b]$, then*

$$\int_a^b f(t)\,dt = G(b) - G(a).$$

Here is a definition:

Definition 2.2. If z is irrational, then by e^z we mean the unique number that has logarithm z:

$$\log e^z = z.$$

The pre-defined theorem-like constructs are **theorem**, **conjecture**, **proposition**, **lemma** and **corollary**. The pre-defined definition-like constructs are **example** and **definition**. You can add your own constructs using the *amsthm* interface [?]. The styles used in the `\theoremstyle` command are **acmplain** and **acmdefinition**.

Another construct is **proof**, for example,

PROOF. Suppose on the contrary there exists a real number L such that

$$\lim_{x\to\infty} \frac{f(x)}{g(x)} = L.$$

Then

$$l = \lim_{x\to c} f(x) = \lim_{x\to c} \left[gx \cdot \frac{f(x)}{g(x)} \right] = \lim_{x\to c} g(x) \cdot \lim_{x\to c} \frac{f(x)}{g(x)} = 0 \cdot L = 0,$$

which contradicts our assumption that $l \neq 0$. □

3 CONCLUSIONS

This paragraph will end the body of this sample document. Remember that you might still have Acknowledgments or Appendices; brief samples of these follow. There is still the Bibliography to deal with; and we will make a disclaimer about that here: with the exception of the reference to the LaTeX book, the citations in this paper are to articles which have nothing to do with the present subject and are used as examples only.

A HEADINGS IN APPENDICES

The rules about hierarchical headings discussed above for the body of the article are different in the appendices. In the **appendix** environment, the command **section** is used to indicate the start of each Appendix, with alphabetic order designation (i.e., the first is A, the second B, etc.) and a title (if you include one). So, if you need hierarchical structure *within* an Appendix, start with **subsection** as the highest level. Here is an outline of the body of this document in Appendix-appropriate form:

A.1 Introduction

A.2 The Body of the Paper

A.2.1 Type Changes and Special Characters.

A.2.2 Math Equations.

Inline (In-text) Equations.

Display Equations.

A.2.3 Citations.

A.2.4 Tables.

A.2.5 Figures.

A.2.6 Theorem-like Constructs.

A Caveat for the TeX Expert.

A.3 Conclusions

A.4 References

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List of Figures

Figure 1: A sample black and white graphic.

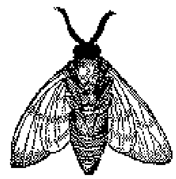

Figure 2: A sample black and white graphic that has been resized with the `includegraphics` command.

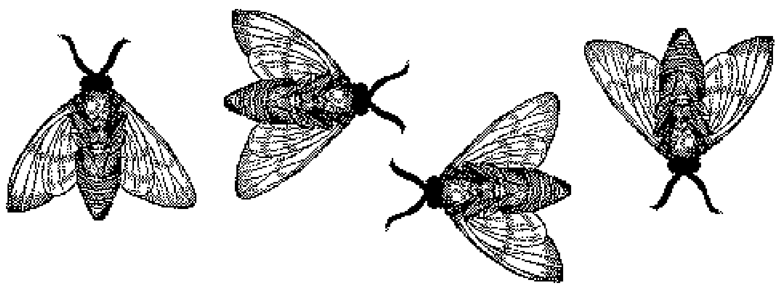

Figure 3: A sample black and white graphic that needs to span two columns of text.

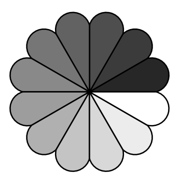

Figure 4: A sample black and white graphic that has been resized with the `includegraphics` command.

List of Tables

Table 1: Frequency of Special Characters

Non-English or Math	Frequency	Comments
Ø	1 in 1,000	For Swedish names
π	1 in 5	Common in math
$	4 in 5	Used in business
Ψ_1^2	1 in 40,000	Unexplained usage

Table 2: Some Typical Commands

Command	A Number	Comments
`\author`	100	Author
`\table`	300	For tables
`\table*`	400	For wider tables

Impact of Big Data on the Privacy of Mental Health Patients

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ABSTRACT

Thanks to the rise of technology, the health-care field has experienced an increase of health information on a daily basis. This increases in health information technology and electronic records have the potential to improve clinical research. However, privacy remain a serious impediment to big data that needs to be addressed. By resolving patients privacy concerns, policymakers and researchers can help transform the mental health field, avoid unnecessary expenses, and establish proper norms to communicate sensitive health information.

1 INTRODUCTION

We live in an era of big data; data exists everywhere in large quantity. The advances in technology has opened the door for businesses to collect inconceivable amount of pieces of information on individuals via emails, smart-phones, sensors, and other social media. The 21st century has witnessed a data explosion; many fields have experienced a data deluge that can contribute to boast the economy via data analysis, make new discovery based on existing data, respond to health problems in quickly manner, and so forth. While it worth celebrating the rapid innovation of technology and the presence of data deluge, it is also crucial to consider the number of barriers and risks that come with the increase of big data. One of the barriers that big data faces is privacy. In the health-care industry, for example, it is not easy to access data due to privacy concern; thus policymakers need to establish proper norms and parameters to collect, share, and house the data. "When considering the risks that big data poses to individual privacy, policymakers should be mindful of its sizable benefits"[4]. While it is important to address the numerous advantages of big data, it remains relevant to figure out ways to prevent data leakage, and to protect the privacy of individuals. This paper showcases the advantages of big data and the ways to overcome the individual privacy concerns.

2 ADVANTAGES OF BIG DATA

Big data presents a number of advantages. Big data helps businesses increase their productivity, it allows government to improve public sector administration and assists global organization in analyzing information. Big data can help to detect disease at an early stage and reduce the effect of seasonal disease on individual. Other advantages of big data analysis is present in many different areas, such as: smart grid, which helps to monitor and control electricity use; traffic management, which provides information on road and mass transit construction, traffic congestion; retail by studying customers behavior to improve store layout; payments by helping to detect fraud detection, etc.[4].

Certain researchers supported the idea that big data allow real time tracking of diseases, predicting outbreaks, and developing personalized healthcare. Big data can really help to maximize profits in many disciplines, including healthcare if harness properly.[5]. As indicates in [2] "by harnessing big data, businesses gain many advantages, including increased operational efficiency, informed strategic direction, improved customer service, new products, and new customers and markets." While data exists in huge quantity in many fields, including the health care field. Individual Privacy remains a big problem that policymakers have to tackle to have proper access in the health care industry.

3 BARRIERS TO BIG DATA IN HEALTH-CARE

One of the barriers to big data in the health care, including mental health is privacy. Regardless of the effort of Policymakers to try to establish different strategies to protect individual health information, privacy remains a serious issue that scientists have to wrestle with when it comes to big data analytic. among the effort of policy makers to secure health information, they have created, for example, Health Insurance Portability and Accountability Act of 1996 HIPAA established the norms to data privacy and security provisions for safeguarding medical and mental health information. Every provider in the healthcare industry must obey the HIPAA privacy laws if they want to continue to remain up and running. The HIPAA laws prohibit providers to share patient's information without their consent, and a lot of time patients refuse to share their personal information for research purposes by fear of being ostracized, discriminated against, marginalized, etc. "The unintended release of a personfis health information into the public realm has huge potential to undermine personal dignity and cause embarrassment and financial harm"[5]. While the healthcare field is faced with a huge increase in health information, individual privacy concern remain a huge conundrum to big data analysis. What can policymakers do to overcome this privacy concern?

4 WAYS TO OVERCOME PRIVACY CONCERN

4.0.1 Data Anonymization. One way policymakers can protect individual privacy is by making the data anonymous. Researchers identified three types of data: personal and proprietary data that is controlled by individuals, government controlled data, which government can restrict access, and open data commons, which means that the data is available to all. They advocated for linking data together that can help to improve care planning at both the patient and population levels. They also argued for an increase of the amount of information that is available as open data commons. Though anonymization of data appears to be a great technique that policy makers could espouse to address the privacy concern, other study indicated that the data can be replaced back to their respective individual.[5]. " Every copy of data increases the risk of unintended disclosure. To reduce this risk, data should be anonymized before transfer; upon receipt, the recipient will have no choice but anonymize it at rest...And re-identification is by design, in order to ensure accountability, reconciliation and audit." If proper norms is established for data analysis, this will contribute to improve the health care industry.

Others advocated for data de-identification and data minimization. The term de-identification is the process of making the data anonymous, but these author explained that this protective measure is valid under the security and accountability principles, but policymakers should think about other ways to protect patientfis privacy. The term data minimization, is the extent to which organizations limit the collection of personal data. It worth noting that data minimization is contrary to big data analysis because data minimization encourages deleting data that is no longer in use to protect privacy, whereas big data prefers to archive the data for ulterior usage. While this technique can help protect privacy, it is antithetic to big data analysis because it contributes to reduce the amount of data collection that could be utilized in data analysis to make new discovery, respond to crisis, and maximize profits [4]. As found in [1] privacy principles should be introduced during data architecture; privacy should be incorporate in the design and the operation procedures. in so doing, personal health care data will be protected against malicious hackers who always try to access individuals personal health information for the purposes of stealing individual's identity.

The concept quantified self can be understood by the fact that individuals engage in self-tracking of personal health data, such as heart rate, weight, energy level, sleep quality, cognitive performance, etc. these individuals use devices like smart-phones, watches, sensors, in the collection of their personal data. It has shown that 60 percent of us adult are tracking their weight, diet or exercise routine, 33 percent are monitoring their blood sugar, blood pressure, sleep patterns, etc. this indicates that there is a vast amount of health that has been collected by individuals; this demonstrates the need to develop policies and involve individual patients into sharing their data to advances health-care through data analysis. Before we talk about analyzing data, the norm to use these data need to be established primarily. [3].

5 CONCLUSION

We have seen that health data exist in large quantity; however, privacy concern is one of the biggest barriers that scientists face when it comes to utilize of health data. Certain researchers proposed data anonymization as a solution to privacy concern, others proposed minimization of the amount of data collected on individual patients. "Privacy concerns exist wherever personally identifiable information or other sensitive information is collected and stored in any form."[2] This indicates that scientists will allow wrestle with privacy concern whenever they are dealing with personal health information.

A HEADINGS IN APPENDICES

the body of this document in Appendix-appropriate form:

A.1 Introduction

A.2 The Body of the Paper

A.2.1 Type Changes and Special Characters.

A.2.2 Math Equations.

Inline (In-text) Equations.

Display Equations.

A.2.3 Citations.

A.2.4 Tables.

A.2.5 Figures.

A.2.6 Theorem-like Constructs.

A Caveat for the TEX Expert.

A.3 Conclusions

A.4 References

`.bbl` file. Insert that `.bbl` file into the `.tex` source file and comment out the command `\thebibliography`.

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Bigdata in Clinical Trails

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ABSTRACT

The vast volumes of data collected across the clinical trials process offers pharma and biotech the opportunity to leverage the information. ACM SIG Proceedings.

KEYWORDS

Bigdata, Clinical, Trails, Healthcare, Phase I, Phase II, Phase III, Phase IV

1 INTRODUCTION

After transforming customer-facing functions such as sales and marketing, big data is extending its reach to other parts of the enterprise. In research and development, for example, big data and analytics are being adopted across industries, including pharmaceuticals.

2 INTEGRATE ALL DATA

Having data that are consistent, reliable, and well linked is one of the biggest challenges facing pharmaceutical clinical Trails. The ability to manage and integrate data generated at all phases of the value chain, from discovery to real-world use after regulatory approval, is a fundamental requirement to allow companies to derive maximum benefit from the technology trends. Data are the foundation upon which the value-adding analytics are built. Effective end-to-end data integration establishes an authoritative source for all pieces of information and accurately links disparate data regardless of the sourcefi!?be it internal or external, proprietary or publicly available. Data integration also enables comprehensive searches for subsets of data based on the linkages established rather than on the information itself. fiSmartfi algorithms linking laboratory and clinical data, for example, could create automatic reports that identify related applications or compounds and raise red flags concerning safety or efficacy.

Implementing end-to-end data integration requires a number of capabilities, including trusted sources of data and documents, the ability to establish cross-linkages between elements, robust quality assurance, workflow management, and role-based access to ensure that specific data elements are visible only to those who are authorized to see it. Pharmaceutical companies generally avoid overhauling their entire data-integration system at once because of the logistical challenges and costs involved, although at least one global pharmaceutical enterprise has employed a fibig bangfi approach to remaking its clinical IT systems.

3 CHALLENGE

Big pharma companies typically keep their cards close to the vest because it costs so much to develop a drug throughout its lifetime. From discovery to prescription pad, a typical medication can take twelve years and $4 billion to shepherd through its lifecycle, a significant investment that would be hard to recoup if everyone had the secret to the newest blockbuster pill, especially since only ten percent of drugs ever make it to market.

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Big data analysis in Finance Sector

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ABSTRACT

In order to understand what drives customer profit, we want to be able to predict what profit group (extremely unprofitable, average, extremely profitable etc.) a set of customers falls into based on their data at any given time.

KEYWORDS

Random Forest, R, standard deviation

1 INTRODUCTION

The *proceedings* are the records of a conference. ACM seeks to give these conference by-products a uniform, high-quality appearance. To do this, ACM has some rigid requirements for the format of the proceedings documents: there is a specified format (balanced double columns), a specified set of fonts (Arial or Helvetica and Times Roman) in certain specified sizes, a specified live area, centered on the page, specified size of margins, specified column width and gutter size [1].

ACKNOWLEDGMENTS

The authors would like to thank

REFERENCES

[1] Ian Editor (Ed.). 2007. *The title of book one* (1st. ed.). The name of the series one, Vol. 9. University of Chicago Press, Chicago. https://doi.org/10.1007/3-540-09237-4

My great Big Dat Paper

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ABSTRACT

This paper provides a sample of a LaTeX document which conforms, somewhat loosely, to the formatting guidelines for ACM SIG Proceedings.

KEYWORDS

i523

1 INTRODUCTION

The *proceedings* are the records of a conference. ACM seeks to give these conference by-products a uniform, high-quality appearance. To do this, ACM has some rigid requirements for the format of the proceedings documents: there is a specified format (balanced double columns), a specified set of fonts (Arial or Helvetica and Times Roman) in certain specified sizes, a specified live area, centered on the page, specified size of margins, specified column width and gutter size [1].

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Big Data Applications in Improving Patient Care

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ABSTRACT

This paper will explore how service providers in health-care industries use data generated when patients provide information about their family history, medical history, food habit, exercise habit.

1 INTRODUCTION

Health service providers collect high volume of information from the consumers every time they visit the facilities. These informations or big data provides helpful insights for diagnostic purpose and treatment options. These data can range from Clinical or pathological category to food and exercise habits, family history or personal body mass index. Clinical practitioners require data to make their medical diagnosis, treatment recommendation, and prognosis. A richer set of near-real-time information can greatly help physicians determine the best course of action for their patients, discover new treatment options, and potentially save lives [**?**]. So to speak fields big data applications in health care for the purpose of improving patient care is wide; disease prevention and management, health education, research and development, prognosis information sharing, public and individual health management, medical optimization.

Health data are stored as electronic medical records(EMR) which are analyzed and shared among clinicians. These data are near real time data. One of the trending example is application of big data in tackling opioid crisis in US. Data scientists at Blue Cross Blue Shield have started working with big data experts at Fuzzy Logix to tackle the problem. Using years of insurance and pharmacy data, Fuzzy Logix analysts have been able to identify 742 risk factors that predict with a high degree of accuracy whether someone is at risk for abusing opioids[**?**].

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REFERENCES

Big Data Applications In Population Health Management

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ABSTRACT

My abstract will go here

KEYWORDS

ACM proceedings, LaTeX, text tagging

1 INTRODUCTION

My introduction will go here [1].

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Big Data Analytics in Agriculture

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ABSTRACT

This paper discusses ways that Big Data and Data Science is impacting the industry of agriculture and food safety in the food supply chain.

KEYWORDS

Precision farming, Smart farming

1 INTRODUCTION

Big Data is revolutionizing the Agricultural Industry. The Internet of things together with the availability of cloud technology is creating a new phenomenon called Smart farming: large amounts of information is being captured, analyzed, and used to make operational decisions. (The *book* are the [**?**]). As a result, farmers are optimizing productivity, reducing costs, reserving resources, and increasing profitability.

Big Data Analytics is also reducing waste and spoilage as food moves thru the supply chain. According to McKinsey and Company, approximately one-third of all food in lost or wasted every year. That equates to a nine hundred forty (940) billion dollar Global impact. The *misc* are the [1]. Much of this occurs during the food shipment process.

Internet connected devices are becoming common place on farms. Almost all new farm equipment has sensors. Sixty percent of farmers report some type of internet sourced data to make operational decisions. Sensors are becoming common in food packaging. The related software market is growing rapidly. In 2010 the investment in Agricultural Technology was 500 million. In 2015 the investment had grown to 4.2 billion The *book* are the [**?**].

The *proceedings* are the [2] The *misc* are the [1]

The *misc* are the [**?**]

The *misc* are the [**?**]

The *book* are the [**?**] The *article* are the [**?**]

2 THE SMART FARM AND PRECISION AGRICULTURE

Precision agriculture is a specific farm management technique that uses sensor and analytic technology to measure, observe and respond to crop and livestock management in real time. As the name implies, Precision farming matches farming techniques to the specific crop and livestock needs. The objective of precision farming is to ensure that crops receive that exact inputs that need, at the correct time, and in precise amounts. Examples of crop inputs include: water, fertilizer, herbicides and pesticides. This strategy enables a farmer to get the most productivity out each and every resource. Solutions are customized to each individual farmerfis unique needs.

Processes that are typically managed with Precision techniques include: seeding, planting, harvesting, weed control, fertilizer management, breeding, disease control, pesticide management, light and energy management. Benefits of precision farming include improved yields, improved crop quality, reduced costs, and increased profits. Because fertilizers, pesticides and weed control applications are not being overused, precision farming also helps the environment.

The life cycle of the smart precision farming process is as follows: Data collection via sensoring and monitoring, data analysis, and intervention and decision making. We will discuss each of this aspects in more detail below.

2.1 DATA COLLECTION

A very common approach to collecting data is Sensor technology. Sensor technologies measure and monitor data. Sensors register and report deviations in real time. Sensors include devices that are located locally on the farm and external satellites.

Types of local sensors include: connected farming equipment (tractors, harvesters), chips planted into livestock, and drones. Examples of the types of data that may be collected via local sensors include: Rainfall and water measurements, crop health, livestock health, weather information, yield monitoring, and lighting and energy management. Drones can collect aerial images of fields. Data is oftentimes collected in very precise detail. For example, information can be gathered for for each square meter of land or for every individual plant.

Data collected with local sensors is often supplemented with information other external sources such as satellites and the cloud. Data that may be collected via satellite and available in real time on the cloud includes: Weather and climate data (historical and real time), soil type analysis, market information, and livestock movements. Data from collected from orbiting satellites can also be very granular and personalized. For example soil characteristics such as texture, organic matter, and fertility is collected to the meter at locations throughout the world.

2.2 DATA ANALYSIS

After the data is collected it must me consolidated and analyzed. A significant amount of this support is being provided by Machine supplier companies that have been servicing the farming industry for generations such as John Deere, Dupont Pioneer, and Monsanto. Now, in addition to selling seeds and machinery, these companies are selling decision support and data science services.

Most of this support is in the form of software decision support technology. Companies collected information from individual farms, combine this information with data other sources, including their own databases, and apply statistical models and algorithms. Results and recommendation are delivered to each grower as a personalized solutions. Examples of some potential solutions are: how far apart to place seeds based upon the field position, what to do to better manage nitrogen levels in the soil. These companies have development massive databases of their own. Dupont Pioneer has mapped and has collected data on 20 million acres in the United States. Another company, Cropin, which provides support for farmers worldwide, including growers in extremely remote areas, has mapped over one billion acres globally. Cropin can provide data by individual farm, farm clusters, districts, states, and even countries (India).

In addition to big companies, there are also public institutions that are involved with Big Data Appliations. These include universitys, the USDA, and the American Farm Bureau Federation The *article* are the [**?**]. Their interest typically involves issues such as food safety, feed security, and data privacy regulation.

2.3 STORAGE AND INFRASTRCTURE

After the data is analyzed it is downloaded from the cloud and made available to the farmers, typically through wireless technology devices. It may be downloaded to an farmers Ipad or computer in a tractor. Other information can be sent to Smart phones. By interacting with the Internet of Things farmers can manage operational activities from anywhere in the world. Other devices are self automated. One such self automated technology is Variable rate technology (VRT). Variable rate technology is built into equipment such as irrigation systems, feeders, and milking devices. These devices automatically operate in such a way as to deliver optimal results with no human intervention.

None of these processes can happen without the appropriate infrastructure to store, transmit, and transform the data. Typical Storage vehicles for this data are typically cloud based platforms, Hadhoop Distributed file system, cloud based data warehouses and hybrid systems. Data transfer is accomplished via wireless technology using cloud based platforms. Machine learning algorithms are typically used to transform and cleanse the data.

3 FOOD SAFETY AND THE FOOD SUPPLY

Inadequate packaging of food often results in food waste and food spoilage that can even result in life threatening food borne illnesses. Packaging sensors can detect gases that is being emitted from food when it starts to spoil. RFID based tracebility systems can monitor food as it moves through the supply system. Packaging intergrity and freshness can be monitored in real time. Waste is reduced and food quality issues can be addressed in real time.

4 EXAMPLES

In this section I will share some examples of how Big Data Analytics is enhancing Agricultural productivity.

Following are some examples of technology in the world of crop science: Satellite systems and sensors can monitor the development of crops in detail. Individual plants can be monitored for nutrients, growth rate and health. In this way disease outbreaks can be recognized and addressed immediately. Entire fields can be mapped with GPS coordinates to collect data concerning soil conditions and elevation. Algorithyms instruct the tractor's planting mechansim where to place every seed. This same technology can even tell if a single seed has been missed. GPS units on tractors, combines, and trucks help determine the optimal usage of equipment.

Big Data technology also improves the field of Animal and livestock management. Milk cows are tagged with chips that monitor the health of the animal. Milking machines shut down when the animal is sick. Sensors indicate when livestock are ready to inseminate or give birth.

Data and consolidated can offer insights and information that has never before been possible. Big data companies can test and gather information about the effectiveness of different kinds of seeds across many different conditions, soil types, and climates. The origin of crop diseases can be identified quickly and efficiently with web searches similar to the way that flu epidemics are currently identified. This will enable players to take corrective action quickly. Historical analytics can determine the best crops to plant.

5 CHALLENGES AND ISSUES

Machine suppliers in the form of big companies have played a big role in this evolution by developing decision support tools that provide information to better manage farms. When farmers share their data with big companies such as John Deere, there is some concern that these big players have the potential to consoldiate the data and use it to manipulate the market. There need to be defined standards for the use of such data. The American Farm Bureau association is seeking data usage assurance regulations within the industry.

6 IMPACTS

Improvements to agricultural productivity as result of big data technology are beyond substantial. Big data is being referred to as the most major revolution productivity in farming since mechanization. In 2009, the United Nations estimated that 900 people in the world were undernourished and that 65 countries face alarming food shortages. Big Data is expected to make an impact on Food Insecurity throughout the world as farmers throughout the world adopt these techniques. Will enable even small holder farmers to make full use of their productive potential. The use of precision farming techniques and digital technologies will enable farmers to maximize the use of every inch of soil and even the production of each individual plant.

7 CONCLUSION

The availability of Big Data Analytics is changing the the way farms are being operated and managed. Farmers have access to information that was previously impossible to get. As a result farmers are experiencing historical productivity improvements. The Farmers are experiecing historical improvements to productivity. Availability of massive amounts of detailed analytical and personalized information is enabling farmers to improve productivity automation of this data All of this leads to better farm management because of access to information that was previously impossible to get

[2] The *misc* are the [1]

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The *book* are the [**?**] The *article* are the [**?**]

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Amazon Web Services (AWS) in Support of Big Data and Analytics

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ABSTRACT

This paper will explore the logistics of Amazon Web Services and how companies are currently utilizing the service to process their big data needs.

KEYWORDS

Big Data, Cloud Computing, AWS, Big Data Analytics

1 INTRODUCTION

Amazon Web Services (AWS), the cloud service arm of Amazon, is currently the most dominant company in the cloud computing marketplace. With a market share of 31%, AWS holds a larger share than the next three closest competitors (Google, Microsoft and IBM)[1]. As a $10 billion a year line of business for Amazon, the revenue stream is incredibly diversified across multiple product offerings. One of these categories, which can broadly be described as 'business analytics,' have helped companies gain new insights into their customer experiences and competitive landscape.

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Big Data Analytics, Data Mining, and Health Informatics: Using Data Mining of Social Media to Track Epidemics

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ABSTRACT

This paper reviews research literature on data mining of social media to track the outbreak of epidemics at the population level. Data mining of search queries and Twitter posts have been used to monitor seasonal influenza as an early detector of epidemics to supplement official sources of public health information. This work shows how big data analytics has applications for public health informatics. Can predictions models based on social networking platforms be generalized to track other epidemics? Limitations of using social media to predict epidemics are discussed.

KEYWORDS

i523, HID335, Data Mining, Social Media, Public Health Informatics

1 INTRODUCTION

In the information age, *Big Data* offers great promise to fuel innovation, generate new revenue streams, and transform society [9]. Can the potential of big data be harnessed for the greater good, to prevent disease and improve health? Seasonal influenza epidemics are a major public health concern, that each year result in an estimated 250,000 to 500,000 deaths worldwide [21]. This paper explores big data in public health informatics, specifically reviewing research on data mining to track epidemics and the spread of contagious disease [10]. Can these approaches be extended to monitor other epidemics such as the opioid crisis in North America? [19] Epidemic spreading is a complex phenomenon based on contact networks between individuals and distributed by transportation networks [4]. Prediction models based on social media may work best in areas with a high degree of internet access and as a supplement to existing methods of disease surveillance.

1.1 Public Health Informatics

The field of Health Informatics is generating huge amounts of data at a rapid pace, from MRI imaging data, electronic medical records (EMRs), clinical research data, to population-level data. This review focuses on population data from search queries and social media to provide insights about epidemics and pandemics [10, 11]. Big data is an ambiguous term that lacks a single unified definition, but is often described in terms of *Volume, Velocity, Variety, Veracity, and Value* [5]. Trying to track an epidemic in real-time from multitudes of incoming web searches and posts involves a high volume of data coming in at high velocity [13, 16]. In order to be of any use, diverse and often messy raw data has to be sifted through and effectively organized for further analysis. The issue of Veracity raises the questions of how reliable social media data are for predicting real life events. What is the relationship between social media data to biological events such as the spreading of contagion and disease? The question of Value evaluates the quality of the data as it pertains to intended outcomes. There are legitimate concerns about the quality of data obtained from the internet; however, the literature suggests that mining information from social media can produce valuable data. An important challenge for making sense of big data is developing analytic tools adequate to handle large volumes of data in real time.

1.2 Data Mining Social Media

Health Informatics research is considered from two levels: where the data is collected, and the research questions being addressed. Research on social media can yield data on a range of issues related to public health, including: spatio- temporal information of disease outbreaks, real-time tracking of infectious diseases, global distributions of various diseases, and search queries on medical questions that people might have [11]. The questions of interest in the current review are: *Can search query data be used to accurately track epidemics in real-time?* and, *can Twitter data be used to monitor epidemics across different regions??*. The general idea is that increasing search query or social media activity is associated with an increasing interest in a given health topic. A limitation of social media data is that, although it has high Volume, Velocity, and Variety, it can be unreliable, resulting in both low Veracity and Value [10, 14]. A review of the literature shows how useful data can be extracted by data mining and analytic techniques.

1.3 Using Search Queries to Track Epidemics

1.3.1 Tracking Epidemics Using Google Search Terms in the U.S.. Seasonal influenza is an acute viral infection that spreads easily from person to person, circulates across regions, affecting people of every age. Traditional flu monitoring estimates from the U.S. Center of Disease Control and Prevention (CDC) based on physician reports of patients with "*influenza-like illness*" (ILI) are released weekly [6], but generally with a one to two week delay. In an effort to improve on early detection of season influenza, a team of researchers developed an automated method to analyze Google search queries to track ILI terms from historical logs between 2003 and 2008, using 50 million most popular searches, and CDC historical data [7]. The *Google Flu Trends* (GFT; https://www.google.org/flutrends) model sought to find the probability that a given search query is related to an ILI of a patient visiting a physician in the same region. GFT used a feature selection method to narrow the 50 million most popular search queries down to 45. These top queries showed connections to influenza symptoms, complications, remedies, that were consistent with searches by individuals with influenza. The researchers based their estimates of the current level of weekly influenza based on the correlation of the relative frequency of search queries and the percentage of physician visits with patients presenting influenza-like symptoms. Thus, analyzing high volume Google search queries was used to predict ILI epidemics in real time for areas with a large population of web users, and provide information to the public in a matter of days to help physicians and hospitals prepare and respond to the outbreak.

1.3.2 Tracking H1N1 Epidemic Using Baidu Queries in China. A research study in China monitored influenza activity by comparing internet search query data from *Baidu* (https://www.baidu.com) to influenza case counts from the Chinese Ministry of Health (MOH) between 2009 to 2012 during the H1N1 epidemic [22]. This study consisted of four parts: (i) Selecting keyword terms related to influenza, (ii) Filtering keywords unrelated to flu epidemics, (iii) Defining weights and composite search index, and (iv) Fitting a regression model with keyword index to influenza case data. In the process of filtering, only 40 of 94 keywords were correlated with the case data, and only 8 of these 40 keywords were used as the optimal set in the composite search index. As expected, the search index captured seasonal variation of influenza epidemics in the Winter and Spring, indicating a good predictor for tracking influenza activity in China. The regression model accounted for 95 percent of the variability in influenza case data (ICD), and the model was validated for a test period in 2012. The mean absolute percent error rate was less than 11 percent for the validation test data. This research yields additional evidence that novel approaches using big data can provide early indicators of epidemic activity that supplement official public health information sources, rather than replacing them. A limitation acknowledged by the authors is the relatively small initial number of keyword search terms used compared to the Google Flu Trends (GFT) project [7]. Another limitation of using search query data is that, although the keywords selected in this model performed well at capturing temporal trends in the H1N1 epidemic, the same keywords may not reflect the trend of an influenza epidemic at a future time. The authors also noted the lack of internet access in rural areas, which underscores the fact that effective tracking of epidemics based on search queries relies on internet access. Furthermore, caution should be used when evaluating correlational data, as causation cannot be inferred from correlation.

1.4 Using *Twitter* API Data to Track Epidemics

Twitter is a free online social networking and micro-blogging service, where users can send and read messages of 140 characters (i.e., *"tweets"*). As of 2017, Twitter has more than 320 million monthly active users (67 million in U.S.), with an estimated 500 million tweets posted per day (https://about.twitter.com). Twitter users share their perspectives and reactions on a wide range of topics, approximately 80 percent from handheld mobile devices, acting as "sensors" of events in real time [1]. The Twitter stream provides a rich data source for tracking or forecasting general sentiment, political attitudes, linguistic variation, detecting earthquakes, and disease surveillance. The large volume of users provides a high likelihood that ILI epidemic information is posted; however, Twitter post data is noisy and perhaps unreliable insofar as it can be difficult to differentiate posts about the flu based on instances of concerned awareness (*"I am worried about the swine flu epidemic!"*) versus actual infection, (*"Robbie might have swine flu. I am worried."*)[13]. Despite the noise in Twitter data from much useless chatter, useful information be obtained from mining data in the Twitter stream.

1.4.1 Using Twitter to Track Disease Activity and Public Concern in the U.S. during the H1N1 Pandemic. In a 2011 study, researchers searched through post data from Twitter‘s streaming API during the H1N1 epidemic (October 2009 to May 2010) across spatiotemporal areas of the U.S. to predict weekly ILI levels [17]. Tweets were sifted according to keywords related to H1N1 (e.g., *"flu", "swine", "influenza"*) and additional terms about vaccines, side effects, and/or vaccine shortages. The first data set consisted of 951,697 tweets containing influenza related keywords from 334,840,972 tweets extracted between April to June 2009 (results were reported as a percentage of observed tweets). These tweets represent just over 1 percent of the sample tweet volume, and this percentage declined rapidly over time as the number of reported H1N1 cases increased. In the U.S. surveillance programs track reported influenza-like illness (ILI) seasonally, from October to May, monitoring the total number of patients seen along with the number with ILIs reported. Quantitative estimates of ILI values based on the Twitter stream were analyzed using support vector regression (SVR) and leave-one-out cross-validation to test model accuracy. Weekly ILI values were estimated using a model trained on roughly 1 million influenza-related tweets obtained between October, 2009 to May 2010. Point estimates of national ILI values produced by the system were good with an average error of 0.28 percent. A regional model, based on significantly fewer tweets, approximated the epidemic curve for CDC region 2 (New York, New Jersey) as reported by the ILI data, but the estimate was less precise with an average error of 0.37 percent. In terms of public interest, Twitter users‘ interest in antiviral drugs dropped, as official disease reports indicated most influenza cases were relatively mild, even as the number of cases was increasing. In addition, interest in hand hygiene and face masks was associated with public health messages from CDC. A limitation of the study is that only a limited number of search terms and one prediction method was used. An important question is whether the results could be improved using broader search terms and other prediction models.

1.4.2 Twitter Improves Seasonal Influenza Prediction. In a 2012 study, researchers implemented a system using an online social network (OSN) Crawler bot to retrieve tweets by keywords (e.g., *"flu", "H1N1", "swine flu"*), geospatial location, relative keyword frequency , and CDC ILI reports [1]. The *Social Network Enabled Flu Trends* (SNEFT) network continuously monitored tweets and profile details of the Twitter users who commented on flu keywords (starting October 2009), to detect and track the spread of ILI epidemics. The correlation between flu related tweets and ILI was very high between 2009 to 2010 (r=0.98) during the H1N1 outbreak, but the correlation dropped substantially for 2010-2011 (r=0.47) after the epidemic, suggesting that noisy tweets became more prominent as H1N1 was less of an issue. To reduce noise, text classification using support vector machines (*SVMs*) was trained on a dataset of 25,000 tweets to determine whether a tweet was related to a flu event or not; data cleansing was conducted to remove multiple tweets posted by the same user during a single bout with the same illness. These methods improved the correlation between the Twitter data and ILI rates from the CDC from October 2010 to May 2011 in the

U.S. (r=0.89), and Twitter data was correlated with ILI rates across subregions. The authors reported that Twitter data alone had higher prediction rates toward the beginning and end of the flu season, and during an epidemic. In addition, age analysis suggested Twitter data best fit the age groups of 5-24 years and 25-49 years, for most regions in the U.S. The results showed Twitter data can be used to detect and possibly predict ongoing ILI epidemics in real time with relatively low error, up to 1-2 weeks earlier than the CDC reportings. It would also be interesting to determine whether these results are generalizable outside the U.S. with different populations in other countries [22].

1.5 *Limitations* of Using Search Queries and Social Media Data to Track Epidemics

The research reviewed above shows how data mining search queries and twitter posts for ILI related information provides an early detection signal to supplement existing epidemic monitoring systems and may help improve public health responses and prevention. There is some evidence that influenza forecasting models based on Twitter data performed better than general search query data [16]; the Google Flu Trends (GFT) algorithms underestimated ILI in the U.S. at the start of the H1N1 (i.e. *swine flu*) pandemic in 2009 [2], and over-predicted seasonal influenza in January 2013 compared to the CDC ILI by almost double [14]. As described above, there are important limitations in using social media data for predicting epidemics: First, internet access and Twitter usage is not uniform by geographical region. Urban areas have higher density of internet connections than rural areas [22], and coastal regions of the U.S. (CA, NY) produced more tweets per person than Midwestern U.S. states (or Europe) [1]. Thus, performance of seasonal influenza predictions models may be limited to regions with high internet access and where tweets are more frequent. Second, exact demographic information about the Twitter population is not easy to estimate (or unknown) and the demographic of internet users does not represent characteristics of the general population. If we consider that outbreaks such as swine flu or avian flu originated at points of contact between humans and domesticated animals in agricultural areas, then internet searches or Twitter posts would provide limited information to predict epidemic spreading in the larger population. Third, though promising, the results of this research are based on correlations between often noisy internet search queries or Twitter posts and physician reports of ILI compiled by official governmental sources. We should be cautious in evaluating predictions about serious health concerns such as epidemics or pandemics based on correlational evidence as the data do not support causal inferences .

2 CONCLUSION

Big data mining of social media has tremendous potential to detect trends and confirm observations based on real time events, providing opportunities to monitor infectious disease on a global level [10]. Can these methods be extended to survey other types of epidemics such as the opioid crisis in North America?[18] Epidemics are described in terms of the proportion of the population infected, those yet to be infected, and the rate of transmission [12]. The dynamics of epidemic spreading is a complex phenomenon, based on contact networks of person-to-person interaction, indirect exposure, and transmission highways such as the *airline transportation network* (ATN) [4]. In addition, the structure of the contact network can influence epidemic spreading [15]. For example, in the case of simple contagion, weak ties among acquaintances or infrequent associations provide shortcuts between distant nodes that reduce distance within the network [8] and can facilitate the spread of disease. Furthermore, networks with "small world" properties have many nodes with few connections, but a small number of highly connected nodes that can rapidly transmit contagion throughout the network [20]. Analyzing the correlation between Twitter posts and rate of ILI reports does not capture the complexity underlying disease epidemics and pandemics. By analyzing the structure of social media networks, future research may help to identify how points of connection online is associated with epidemic spreading in the external world [23]. The emergence of new technologies, such as wearable biosensors [3] may help improve geospatial mapping seasonal influenza and other epidemics. A combination of approaches may prove to be more effective than any individual approach.

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Big Data Analytics: Recommendation Systems on the Web

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ABSTRACT

This paper is an overview of Recommendation Systems being used on the web. It will go over some popular techniques that are being used in modern systems. It will briefly discuss a couple state of the art systems. Then if will finally touch on some of the limitations and challenges that there are to overvome in the field.

KEYWORDS

i523, hid336, Recommendation Systems, Big Data

1 INTRODUCTION

Recommendation systems (RS) leverage big data in ways that create value for both businesses and customers."The goal of a recommender system is to generate meaningful recommendations to a collection of users for items or products that might interest them" [6]. In this sense, an item can range from a product in a store, a news article on a site, or even a search query. RS is beneficial to businesses and customers by increasing metrics such as revenue and customer satisfaction [2]. Many online platforms are starting to use RS to analyze their data. General analysis of modern techniques, companies currently using RS, and challenges and limitations will give a better understanding of RS.

2 RECOMMENDATION TECHNIQUES

Three common RS techniques would include content-based, collaborative, and hybrid recommendations [1]. Other techniques exist, but these three are the most widely used today. The best technique depends on what recommendations need to be made, and the data used to make them. Many times, the hybrid approach is used because there can be limitations with other approaches [1]. It is best to understand a little bit about each technique before choosing which is best.

2.1 Content-Based

Content-Based RS recommend items to users by using descriptions of items and how the user is profiled based on their interest [7]. Items are classified by different characteristics,attributes, or variables [7]. Once items are classified, they can be grouped together based on the classifications. Users are classified by information they provide to the system, and/or data collected by interacting with the system.

Content-Based RS are commonly seen on web applications and E-commerce sites. These types of systems can easily track and monitor almost all user activities. Usually a user has an account with the system, where information was voluntarily provided. With this data, users can be classified easier compared to a customer walking into a brick and mortar business.

2.2 Collaborative Filtering

"Collaborative Filtering is the process of filtering or evaluating items using the opinions of other people" [9]. This type of RS is commonly seen on systems where an item can be rated by a user. With this technique, user rating are collected and store from a user for an item that they have used or purchased. The ratings from users are then compared to other users that have rated the same item. For example, person A buys items 1 and 2 and rates each item highly. Then, person B buys item 1 and rates it highly. Since person A and B both bought and rated item 1 highly, the system would likely recommend item 2 to person B. On the contrary, if person B gave item 1 a low rating, the system would not likely recommend item 2 to person B. This concept uses the assumption that "people with similar tastes will rate things similarly" [9]. This assumption may not be true in all cases, but it is a good base for RS to start learning users interest, and recommend items based on those interest. With this technique, the more ratings that the systems has collected per item, and the more ratings given by the user, the easier it is for that system to make recommendations to that specific user.

2.3 Hybrid

Hybrid RS takes two or more techniques and combines them to improve performance and reduce limitations that a single technique might have [3]. In most cases, collaborative filtering is used with one or more of the other techniques to improve performance. Other techniques that are used and not discussed include Demographic, Utility-Based, and Knowledge-based recommendations [3].The hybrid approach narrows down items with one technique, and then uses another technique on that subset of items to make a more accurate recommendation. The best hybrid system really depends on the specific business case, and the data being used to make the recommendation. In some cases, a set of techniques may produce better recommendations than any of the other set of techniques.

An example of a hybrid approach would use collaborative filtering and the content-based methods described above. Say that User A is interested in baseball. The system would use the content-based approach to narrow down all items that are classified as baseball items. From this subset of baseball items, the system could then use the collaborative-filtering approach to find the items with ratings from other users which will be user group B. The system would then find all item ratings from user group B and compare those item ratings to person A. If there are any users in group B that have similar likes to person A, the system would likely recommend the baseball items to person A that person B has previously rated highly. This is a generic example of how a hybrid RS would work. Real world examples are more complex than this example, and use large amounts of data.

3 MODERN SYSTEMS

Two well known companies that are currently using RS are Netflix and Amazon. These two companies have huge customer bases, in which they collect data on. The data is what drives their state of the are RS to make predictions to their users, and they are doing this very well.

3.1 Netflix

Netflix is an internet based company that offers a variety of movies and television shows. Netflix had a problem of customers sorting through its large selection of movies and shows, and eventually losing interest which resulted in abandonment of their services [5]. Over the years, Netflix has created and continually developed new RS algorithms which they claim saves them more than one billion dollars per year and a monthly turnover in the low double digits [5].

Netflix does very well at recommending movies and shows to its users. They have incorporated different strategies to collect data from users whcih is the base of their RS. Data is collected in the form of customized search, video ratings, continue watching feature, amount of time spent watching and other user activities [5]. From the data collected from these features, Netflix can recommend top rated, now trending, and videos based on user interest, which is very appealing to the user when there are so many selections to choose from.

3.2 Amazon

Amazon is an online store that sell a large variety of products. Amazons RS provides recommendations for millions of customers from a catalog that has millions of products. [10]. Instead of comparing customers to customers, amazon uses an item-based collaborative filtering approach. This process finds items that were bought together with unusually high frequencies, and uses these relationships to recommend products to customers based on what they have purchased in the past [10]. With this algorithm, Amazon is providing a unique experience to every user and helping them find products they may not have found. Since the initial launch of this algorithm, it has "been tweaked to help people find videos to watch or news to read, been challenged by other algorithms and other techniques, and been adapted to improve diversity and discovery, recency, time-sensitive or sequential items, and many other problems. " [10]

4 CHALLENGES AND LIMITATIONS

As with most technologies, RS has its challenges and limitations. It is hard to speak of this topic without speaking about the questions "more data usually beats better algorithms" [8]. This quote has raised controversy to which of the two actually produce better results. In most cases, there are many diferent variables to consider when answering this question.

4.1 Limitations

With complex systems, there can be many variables that cause issues that limit full capabilities of that system. Specifically, in RS, some of these limitations include cold start problems,data sparsity, limited content analysis, and latency problems [?]. These limitations seem to be more data related rather than the actual techniques and approaches of the technology being used to analyze that data. When there is no data for a new user, it is hard for RS to recommend anything to this user. The system has no data on the users activities or what interests that user has. When a new item is added to a system, there are no reviews and no data collected with the interaction of user for this particular item. On the other hand, too much data can become redundant. At this point gathering more data will have limited gains.

4.2 Cross-Domain Recommendations

Cross-Domain recommendations aim to "leverage all the available user data provided in various systems and domains, in order to generate more encompassing user models and better recommendations" [4]. Every day the amount of data being collected increases. This data is being collected from different sources. Cross-Domain RS could use data from different sources to perhaps makes up for some of the data caused problems. An example of a Cross-Domain recommendation would be Netflix using data from facebook to help recommend movies to a new user. Using data from various systems like this would bring up new issues like privacy and security, but if systems started working together and sharing data there could be benefits for both systems.

Cross-Domain Recommendations help with domain specific data issues. Two different systems may have different ways of collecting and organizing data. If system 1 collects variables A ,B and C, and system 2 collects variables A, B, and D, each system has information that the other system does not have. This is where sharing the data between systems could have benefits for both systems. In doing this, each system is not only benefiting from more data, but different and perhaps better data. This would also require using better algorithms to analyze the different sets of data. Depending on the system, more data can be more beneficial than better algorithms. In terms of scaleability, gathering more data that is different from what is currently being collected, and using better algorithms along with the different data could potentially maximize recommendations for that system.

5 CONCLUSION

With a base understanding of RS, it is easy to see how this technology can be very beneficial in online platforms. RS has different techniques that can be used in a variety of online systems. Many large companies are creating custom RS and are benefiting greatly from them. As the massive amount of data grows from day to day, the ways in which RS is used will continue to evolve. It will be interesting to see how Cross-Domain Recommendations are used in the future, and if companies start to adopt this concept of sharing data. Data being analyzed from various systems could unlock hidden information that a single system may not be capable of producing.

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Big Data and Artificial Intelligence solutions for In Home, Community and Territory Security

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ABSTRACT

Having an intelligent ear-and-eye monitoring at the home to constantly observe the surroundings both inside and outside can protect the house and personnel much more safer way. By extending this capability to the neighborhood and city through collaboration would create safe cities across the world.Smart Security systems equipped with Video and Audio sensors produce huge amounts unstructured data continuously. This paper talks about high level architecture of an intelligent security system with video surveillance, audio monitoring/recording, video and Audio analytics, alerting homeowners/authorities/agencies as needed. Big Data analytics becomes critical in supporting these modern applications.

The key differentiating capability of this system is to use micro drone with voice and video sensors to process the audio and video data with machine learning algorithms.

KEYWORDS

Big Data, AI, Deep Learning

1 INTRODUCTION

In the today's technology world, drones are becoming more familiar in the main stream life activities such as recreational, spy cameras by authorities, home delivery of goods etc. The present security systems used by households are static cameras used at a fixed location inside or outside the house. They are connected to network and provide alerts when any event occurred. However, they are not intelligent enough to understand the context, recognizing the people faces, and aware of family members behaviors, house needs etc. By making cameras movable across the house and outside and process the data as humans do and take decisions of alerting or informing to the right people is the key concept of this paper.This system to be functional, the following technologies needed:

Micro drones with audio and video sensors

Facial recognition and mapping through video analytics to recognize people

Natural language processing (NLP) to recognize family members, friends and strangers

Machine learning algorithms to understand family members habits and behaviors

Interfacing with email servers, phone, text message servers

2 BIG DATA:VIDEO ANALYTICS

Video analytics plays a key role in modernizing video surveillance systems.Deep Learning the fastest growing field of Artificial Intelligence, enabling computers to interpret huge amounts of data like videos.The Graphics Processing Units (GPUs) provided by vendors like Nvidia enabling the deep learning infrastructure to cameras and recorders.

2.1 Big Data:Audio Analytics

We have already seen several typeface changes in this sample. You can indicate italicized words or phrases in your text with the command `\textit`; emboldening with the command `\textbf` and typewriter-style (for instance, for computer code) with `\texttt`. But remember, you do not have to indicate typestyle changes when such changes are part of the *structural* elements of your article; for instance, the heading of this subsection will be in a sans serif[1] typeface, but that is handled by the document class file. Take care with the use of the curly braces in typeface changes; they mark the beginning and end of the text that is to be in the different typeface.

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2.2 Yet to define

You may want to display math equations in three distinct styles: inline, numbered or non-numbered display. Each of the three are discussed in the next sections.

2.2.1 Inline (In-text) Equations. A formula that appears in the running text is called an inline or in-text formula. It is produced by the **math** environment, which can be invoked with the usual `\begin . . . \end` construction or with the short form `$ . . . $`. You can use any of the symbols and structures, from α to ω, available in LaTeX [**?**]; this section will simply show a few examples of in-text equations in context. Notice how this equation:

$\lim_{n\rightarrow\infty} x = 0$,

set here in in-line math style, looks slightly different when set in display style. (See next section).

2.2.2 Display Equations. A numbered display equation—one set off by vertical space from the text and centered horizontally—is produced by the **equation** environment. An unnumbered display equation is produced by the **displaymath** environment.

Again, in either environment, you can use any of the symbols and structures available in LaTeX; this section will just give a couple of examples of display equations in context. First, consider the equation, shown as an inline equation above:

[1] Another footnote here. Let's make this a rather long one to see how it looks. Footnotes must be avoided.

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The details of the construction of the `.bib` file are beyond the scope of this sample document, but more information can be found in the *Author's Guide*, and exhaustive details in the *LaTeX User's Guide* by Lamport [?].

This article shows only the plainest form of the citation command, using `\cite`.

Some examples. A paginated journal article [?], an enumerated journal article [?], a reference to an entire issue [?], a monograph (whole book) [?], a monograph/whole book in a series (see 2a in spec. document) [?], a divisible-book such as an anthology or compilation [1] followed by the same example, however we only output the series if the volume number is given [?] (so Editor00a's series should NOT be present since it has no vol. no.), a chapter in a divisible book [?], a chapter in a divisible book in a series [?], a multi-volume work as book [?], an article in a proceedings (of a conference, symposium, workshop for example) (paginated proceedings article) [?], a proceedings article with all possible elements [?], an example of an enumerated proceedings article [?], an informally published work [?], a doctoral dissertation [?], a master's thesis: [?], an online document / world wide web resource [? ? ?], a video game (Case 1) [?] and (Case 2) [?] and [?] and (Case 3) a patent [?], work accepted for publication [?], 'YYYYb'-test for prolific author [?] and [?]. Other cites might contain 'duplicate' DOI and URLs (some SIAM articles) [?]. Boris / Barbara Beeton: multi-volume works as books [?] and [?].

A couple of citations with DOIs: [? ?].

Online citations: [? ? ?].

We use jabref to manage all citations. A paper without managing a bib file will be returned without review. in the bibtex file all urls are added to rfernces with the *url* filed. They are not to be included in the *howpublished* or *note* field.

3 CONCLUSIONS

This paragraph will end the body of this sample document. Remember that you might still have Acknowledgments or Appendices; brief samples of these follow. There is still the Bibliography to deal with; and we will make a disclaimer about that here: with the exception of the reference to the LaTeX book, the citations in this paper are to articles which have nothing to do with the present subject and are used as examples only.

ACKNOWLEDGMENTS

The authors would like to thank Dr. Yuhua Li for providing the matlab code of the *BEPS* method.

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[1] Ian Editor (Ed.). 2007. *The title of book one* (1st. ed.). The name of the series one, Vol. 9. University of Chicago Press, Chicago. https://doi.org/10.1007/3-540-09237-4

Docker in support of Big Data Applications and Analytics

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ABSTRACT

This paper will analyze the processing power of docker with big data use cases

KEYWORDS

i523

1 INTRODUCTION

ACKNOWLEDGMENTS

REFERENCES

Big Data Analytics for Research Libraries and Archives

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ABSTRACT

Research libraries and archives have played a longstanding role in information management and access. In the second half of the twentieth century, libraries were at the forefront of automation and networked access to information. Since the advent of the internet, however, they have failed to keep pace with technological advances and now face serious challenges in serving the evolving needs of researchers, which are increasingly focused on solutions for preserving and processing large amounts of data. To remain relevant in the current information landscape, libraries and archives must implement new strategies for converting legacy data to formats that can add value to the research lifecycle.

KEYWORDS

Libraries, Archives, Data Management, Data Integration, ETL

1 INTRODUCTION

Examples of big data analytics in research libraries and archives are still scarce. In the library domain, the leading data hub is the Online Computer Library Center (OCLC)[1].

2 CONCLUSION

Conclusions and abstracts must not have any citations in the section.

ACKNOWLEDGMENTS

The authors would like to thank Dr. Gregor von Laszewski for his support and suggestions in writing this paper.

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[1] M. Teets and M. Goldner. 2013. Libraries' Role in Curating and Exposing Big Data. *Future Internet* 5 (2013), 429–438. https://doi.org/10.3390/fi5030429

Big Data in NCAA Football

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ABSTRACT

This paper provides an overview of applications of big data in NCAA football.

KEYWORDS

i523

1 INTRODUCTION

National Collegiate Athletics Association (NCAA) football is one of the most widely watched sports in the United States. The size of the fan base and the profits that can be derived from televised games incentivizes universities and other interested parties to invest in the application of big data analytics and data science methods in general to improve on-field outcomes by enabling better management of player well-being and performance. The purpose of this paper is to provide an overview of the use of data science in National Collegiate Athletics Association (NCAA) football. Recent research on the use of data science to improve various aspects of NCAA football will be surveyed, while current trends and their implications will be discussed.

ACKNOWLEDGMENTS

The authors would like to thank

REFERENCES

Big Data Applications in Self-Driving Cars

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ABSTRACT

This paper provides a sample of a LaTeX document which conforms, somewhat loosely, to the formatting guidelines for ACM SIG Proceedings.

KEYWORDS

ACM proceedings, LaTeX, text tagging

1 INTRODUCTION

The *proceedings* are the records of a conference. ACM seeks to give these conference by-products a uniform, high-quality appearance. To do this, ACM has some rigid requirements for the format of the proceedings documents: there is a specified format (balanced double columns), a specified set of fonts (Arial or Helvetica and Times Roman) in certain specified sizes, a specified live area, centered on the page, specified size of margins, specified column width and gutter size [1].

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My great Big Dat Paper

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