MScA Capstone Research Paper 2023

Paper Requirements & Format Template

The final paper at the end of the capstone process will include:

Title page. See template and formatting guide below for details

Abstract. Consists of a maximum of 50-100 words in one paragraph (*not indented*). Briefly, describe the project as follows: mention the problem, present key findings and include brief of the purpose, and method. The abstract should be on its own page, with the heading "Abstract" centered at the top of the page in 14-point, boldface type. The page number, Roman numeral "i," should be centered at the bottom of the page.

List of keywords. Include 6–10 keywords on the same page as the abstract, about one inch below your text. Select keywords that would help a researcher retrieve your report.

Executive summary. The executive summary is a summary of your report. The executive summary is an extended version of the abstract with more space allocated to the key findings of the project and conclusions/recommendations. Begin with a brief statement of the problem, provide the conclusions/recommendations, continue with some background or literature review (if necessary), explain the data and methodology (models) and end with the conclusions/ recommendations perhaps in greater depth along with directions for future research. The executive summary should begin with a centered title (boldfaced, 14-point font). It should be a **maximum of one-page.** It should be on it's own page, with pg number ii.

Table of Contents. Center the words "Table of Contents" at the top of this section (boldfaced, 14-point font). List major report sections at the left margin. Indent second order headings. It is not necessary to include third order headings in the table of contents. The first page will be Roman numeral "iii." Use APA format and Roman numerals for all page numbers if your table of contents (including lists of figures, tables, and symbols) extends past page "iii".

- **List of appendices.** (if applicable) These are part of your table of contents, not a separate heading (see sample).

- **Lists of figures, tables, and symbols** (if applicable). These are a continuation of the table of contents, not on a new page, but with their own headings (see sample). Include the labels, titles, and page numbers of all figures, tables, and symbols. Use Roman numerals for all page numbers if your table of contents extends past page "iii".

See the sample at the end of this guide for the proper table of contents and lists of figures, tables, and appendices formatting.

Introduction. Includes the following subsections:

- **Problem/Opportunity Statement**: (pick Problem or Opportunity) Describes the business problem/opportunity and why your research is needed. Your problem/opportunity statement should be written in paragraphs, without additional subheadings. The bullets below are just to outline the content that this section needs to cover.

    - A brief description of the current practice and/or business context

    - The challenge or new opportunity that creates a problem that your research can solve

    - Significance of the problem: the costs of NOT addressing the problem or opportunity

    - A high level description of the client's desired solution and the benefits it would deliver. Identify any financial benefit to the client. Still write in terms of the client here, not in terms of your project's deliverables.

- **Analysis/Research Goals:** (pick Analysis or Research) Describes your work intends to accomplish that would achieve the desired solution outlined in the problem statement. The objectives should be made consistent with the problem or opportunity statement. The objectives may require multiple steps, but do not list out the detailed steps of your implementation here.

- **Scope:** Describe any scope limitations for your work. Scope narrows down the research purpose and identifies any limitations that scope may pose. For instance, you may develop home pricing models using data only for the city of Chicago, and therefore your work can can only be used in Chicago.

Background: Describes information that is relevant for an understanding of the project. Include a description of the business or organization partner that would provide a better understanding of the purpose of the project. (Do not use "marketing" language to discuss the partner. The purpose is not to promote the partner.) This section can also include the following:

- Additional background information about the domain, problem, or client

- Any relevant definitions

- Any necessary or relevant discussions about the topic, including past efforts at solving the problem (in literature review)

- **Literature review:** (subheading within background) Presents previous research on models or other approaches to the problem that can inform the work in the present project. This should be a cohesive narrative, in paragraph form, with APA parenthetical citations (not a series of individual paper summaries). Your references should be academic/published sources, not wikipedia or blog articles. Google Scholar can help you find sources.

    After reading your literature review, the reader should be able to answer the following:

    - What kind of problems have been solved using analytics in this specific industry? i.e Insurance companies use image processing for car damage detection

- What previous research can shed light on how to address the problem or opportunity? What kind of methodologies have others used in published literature for your problem (or similar problems). Include an overview of how methodologies have improved over time. (I.e. For image detection problems, people used to apply edge detection or houff transform, but now they use pre-trained transfer learning frameworks such as YOLO). Provide high level descriptions of the models if needed, but more detailed descriptions of the model algorithms you chose to implement will go in your Methodology section.

- What other problems are being solved using these models outside of the domain of your project? (i.e. If your project is in the insurance domain, but you find applications in healthcare or marketing)

Data: This subsection identifies and defines variables and the sources of data in detail and gives a view into the data with descriptive analyses:

- **Data Sources**

  - Description of data sources; limitations and delimitations; units of analysis; time window for aggregation and modeling (if applicable); and description of training/validation/testing samples; and dependent variable(s). Note: A detailed description of feature engineering and variable transformation will be in the Methodology section.

  - Note: Do not include very large tables or lists of variables here. Try to be concise. Additional details can also be placed in the appendices if needed (and referenced).

- **Descriptive Analysis:** Identify and discuss the results of analyses that provide a view into the data. These may include highlighting the relationships that are important for the research, validating assumptions with respect to important metrics, and providing evidence that substantiates the way data are analyzed. This secton should include the *results* of the anaysis, not just a descripton of what was performed.

  - Examples: correlation anaysis, distribution analysis, time series anaysis, etc.

  - At minimum, you should give the reader insight into your dependent variable. What is the distribution? If it is categorical, what are the classes and is it balanced? If it is time series, how is it trending over time?

Methodology: Describe the approaches and components of your methodology. If your research includes multiple different objectives, you can include additional subsections within your methodology for each objective. *Do not include any graphs or evaluation numbers in this section/subsections. The only visualizations can be diagrams of your modeling framework/architecture, if necessary.*

- **Feature Engineering:** Describe data transformation, feature extraction, etc that are required to prepare your data for modeling.

  - If no feature engineering is required to further process the data from your client, make that clear.

- Detail the dependent variable and summarize the independent variables that resulted from your feature engineering and will be used for your modeling.
- **Modeling Frameworks**: Describe the methodology for all model approaches that you used to solve your business problem. If you experimented with multiple models, make sure to describe the methodology for each of the approaches.
  - Briefly discuss the functional form of each of the models. Describe the important details of how each model works, with references to original literature as necessary.
  - Make sure it is clear what each model is trying to predict.
  - Discuss the assumptions of the model(s) that need to be validated.
  - Describe how the models were trained for your problem. Include details about parameter tuning, validation procedures, and what evaluation metrics were chosen. (But do not include evaluation metric values in Methodology)

Findings: Detail the results of implementing your methodology

- Evaluate and compare model performance. Include evaluation metrics.
- Include visualizations (charts, tables) to support findings as needed. Note: Do not take screenshots of model summary statistics outputs or tables. Images/screenshots of other visualizations are acceptable. Make sure all axes and labels are clearly visible and all figures/tables have appropriate labels and descriptions. All visualizations should serve a clear purpose and be described/referenced in the preceding paragraphs. Do not leave the interpretation up to the reader.

Discussion: Interpret your findings. Make sure to interpret your findings in a way that acknowledges the limitations of the research. That is, do not extrapolate the insights derived from your research to situations you have not examined.

- Discuss the extent to which objectives were achieved, and if they were not all achieved, why not.
- Discuss which model/methodology worked best and why.
- Discuss why the other approaches did not "win". Were there problems, invalid assumptions, etc?
- Highlight any issues encountered.
- Discuss the limitations of your approach(es) and how they impact the outcome.
- Make sure to keep your discussion within the limits of your research/work.

Conclusion: Give closing remarks about the final deliverable and its applications.

- Summarize the final deliverable that was given to the client, and how it should/could be used.
- Quantify the impact of your work to the client, if possible. Identify any financial impact, if applicable.
- Discuss next steps

- Discuss other recommended uses or possible extensions of your work, if any, at a high level.

References: Lists the sources that were consulted and that are relevant for the project in APA format. Continue page numbering with Arabic numerals.

Appendix/Appendices: (as needed) Use appendices to present detailed information that supports your conclusions. These sections may include details of data analyses, programming code, data layout, etc. If you want to include different kinds of supporting data, use more than one appendix, numbering them consecutively and giving each a distinctive title. List the titles of all appendices in your table of contents (see sample). Continue page numbering with Arabic numerals.

Formatting and Style Guide

<u>Font and line formatting:</u>

- **Font, Paper Size:** Times New Roman, 8.5"x11" paper

- **Paper Title**: Center aligned, 18pt font, **bold,** Title Case

    - Student and advisor name lines: 12pt font, centered

    - Rest of lines on title page: 14pt font, centered

- **Headings**

    - **Heading Level 1**: Center aligned, **bold**, 14pt font, Title Case

    - **Heading Level 2**: Left aligned, **bold**, 12pt font, Title Case

    - **Heading Level 3**: Left aligned, ***bold italic***, 12pt font, Title Case

- **Figure & Table Labels:** Type and Arabic # in **bold**, followed by a period, then a concise description in *italics*. Center aligned, 12pt font. The label/description should always be *above and on the same page as the figure/table*. Figures/tables in appendices should be prefixed with the appendix letter and numbered accordingly (see example paper below).

    - **Figure 1.** *Figure description*

    - **Table 1.** *Table description*

- **Body Text**: 12pt font, left aligned, <u>double</u> spaced (not 1.5), **no** extra spaces between paragraphs or headings beyond a regular double space. Indent first line of each paragraph (except for Abstract)

- **Page Breaks:** Abstract, Executive Summary, Table of Contents, Introduction, References, and the first Appendix should all start on a new page. Other sections (including additional TOC pages or appendices) should **not** start with a new page break. If you are starting a new section and only the heading is at the top of the previous page, you can add an extra line break to bring the title on the same page as the text. Same for figures/tables.

- **Table of Contents**: Do not number sections. Include only Level 1 and Level 2 section headings, starting with Introduction. Level 2 headings are indented. Include page numbers connected with dots. See example paper.

- **List of Tables and List of Figures:** Included on the same page(s) as your Table of Contents, with the Figure/Table number, description, and page numbers. See example.

- **Page Numbers:** Title page has no page number. Abstract, Executive Summary, and Table of Contents have lowercase Roman numeral numbers (i, ii, iii, …). The rest of the paper, starting with the Introduction, has Arabic page numbers (1, 2, 3, …)

Heading Levels for Paper Sections and Subsections
You may add additional level 2 and level 3 headings if necessary, but do so sparingly.

- **Abstract:** Level 1
- **Executive Summary:** Level 1
- **Table of Contents:** Level 1
- **List of Figures:** Level 1
- **List of Tables:** Level 1
- **List of Appendices:** Level 1
- **Introduction:** Level 1
- **Problem Statement:** Level 2
- **Analysis Goals**: Level 2
- **Scope:** Level 2
- **Background:** Level 1
- **Literature Review:** Level 2

- **Data**: Level 1
- **Data Sources:** Level 2
- **Descriptive Analysis:** Level 2
- **Methodology**: Level 1
- **Feature Engeineering**: Level 2
- **Modeling Framework**: Level 2
- **Findings:** Level 1
- **Discussion:** Level 1
- **Conclusion:** Level 1
- **References:** Level 1
- **Appendices:** Level 1

References and Citations:
- **APA** style, with proper in-text parenthetical citations

Please see the Purdue OWL APA guide for detailed help with citations and references:
https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/

Writing Style and Voice
Your paper should be written in a formal, academic style.

- Write in complete sentences and paragraphs. Avoid bullets and lists.
- Be clear and concise in your writing. Avoid run-on sentences and overly verbose wording.
- Avoid casual and conversational language.
- Write in a direct manner. You may use active voice and the first-person "we" when describing your work (<u>do not</u> reference "the team"). If you use first person, avoid litanies of sentences starting with "we". It should be clear that you did the work, but then also reference the results of that work. For example:
  - Good: "We performed a correlation analysis to identify important features. The results showed…"
  - Not as good: "We performed a correlation analysis to identify important features. We found…"
- Don't over-use transitional or conjncitve phrases (i.e. "as such", "therefore", "as mentioned"…)
- Use past tense when discussing your work in methodology and findings. Describe what was done - not what is hoped for, will be, etc. You may use future tense only when referring to suggested future work/applications in your conclusion.
- The audience for your paper is both your client and outside readers. Your work should be largely understandable by both technical and non-technical audiences who have some analytical acumen.
- In the paper, focus on what was accomplished. If you had to adapt to difficulties or pivot laong the way, these details can be discussed more in your presentation.

- Be mindful of your spelling and grammar. Each team member should proofread the paper prior to submission. It is highly recommended that you use a tool like Gramarly to automatically proofread your paper.
- If you need additional help with your paper, please make an appointment with the TA. UChicago GRAD also offers writing resources and one-on-one writing consultations. It is highly recommended that you take advantage of the resources available. You can find more information here: https://grad.uchicago.edu/academic-support/writing-resources/

Example Paper Formatting
See the attached sample paper below (with short dummy text) for guidance on formatting and page numbering. Note: The dummy text does not have any in-text parenthetical citations and is much shorter than your acutal paper.

Capstone Project Title

By

Student Name

Student Name

Supervisor: First Name Last Name

A Capstone Project

Submitted to the University of Chicago in partial fulfillment
of the requirements for the degree of

Master of Science in Analytics

Division of Physical Sciences

Month Year

Abstract

Lorem ipsum dolor sit amet consectetur adipiscing elit, pulvinar conubia etiam nostra lobortis ullamcorper tincidunt, maecenas ultricies leo aliquet gravida ultrices. Nulla eleifend pulvinar inceptos blandit nisl lacus pharetra eget, euismod integer dui arcu cum quis. Ut auctor nisl mollis dictum torquent massa cursus fermentum, commodo quis lacus rhoncus placerat ligula hendrerit, mauris eget eleifend proin semper potenti euismod. Curae iaculis suspendisse primis etiam nascetur pretium quis nisi posuere, himenaeos accumsan tempus pharetra scelerisque dui justo magnis nisl, curabitur vulputate ante nulla ultrices mus massa hendrerit.

Keywords: computer vision, deep learning, explainable AI, healthcare, image segmentation, GPU

Executive Summary

Lorem ipsum dolor sit amet consectetur adipiscing elit phasellus commodo, blandit litora consequat ad per arcu pellentesque accumsan posuere cum, sem dictum magnis ligula eleifend diam pharetra morbi. Vestibulum dictum diam massa platea lobortis ut sociosqu suscipit, placerat pellentesque erat quisque ullamcorper mollis cubilia nulla malesuada, urna auctor aptent mattis risus purus tellus. Nisi per metus hendrerit inceptos at bibendum tempor pulvinar enim, nascetur feugiat augue lectus fusce nam congue orci rutrum commodo, purus dui mi nullam egestas morbi ultricies mattis.

Phasellus fermentum curae aliquet in porttitor lacus, urna nullam ultricies sapien id eu cum, eleifend himenaeos venenatis luctus purus. Curae curabitur sagittis magna faucibus dictumst elementum pellentesque eget auctor sociosqu cubilia praesent, velit fusce dapibus risus consequat metus nisl dui orci quisque laoreet morbi non, habitant scelerisque litora fermentum torquent mauris malesuada mollis justo tempus suspendisse. Himenaeos semper lacinia est vestibulum pretium fringilla, fermentum cum libero quis hendrerit facilisis sagittis, risus fames eleifend pharetra cubilia nec, nascetur purus pulvinar euismod aliquet. Felis nascetur rutrum porttitor praesent parturient aliquam est quam cras iaculis, feugiat erat fames metus ullamcorper ultricies non eleifend fermentum euismod, pulvinar lacus curae sodales sociis at a sollicitudin tristique.

Table of Contents

(Note: Only Level 1 and Level 2 headings should be represented in the Table of Contents. If you added additional Level 2 headings, make sure to include them in your TOC. If your main TOC is not a full page, the List of Figures and List of Tables should continue on the same page. Do not include any of these descriptive instructions in your TOC)

List of Figures

(if description runs onto two lines, hanging indent subsequent lines, similar to references)

List of Tables

Introduction

Lorem ipsum dolor sit amet consectetur adipiscing elit lacinia auctor, ut quisque senectus ridiculus tellus mi augue accumsan, dictumst eros sagittis viverra sollicitudin montes a nisl. Est tristique nascetur enim molestie cursus aptent per elementum, sodales sociis tortor etiam phasellus mauris maecenas, facilisis neque hendrerit luctus ultricies lacus leo. Sed nunc mattis ut felis habitasse conubia id sodales imperdiet tellus, suscipit nullam neque ad urna malesuada at auctor. Turpis tincidunt sem bibendum posuere himenaeos dignissim ligula, magna cubilia pharetra mi per urna, ante dis morbi lobortis tempus potenti. Vitae sociosqu enim dignissim felis eleifend potenti congue tellus suscipit magna nascetur, interdum ridiculus nostra nulla vulputate luctus torquent quisque porttitor sapien varius, consequat blandit nullam sagittis sem velit nec aenean tincidunt sed. Penatibus dignissim venenatis ultrices cum mattis magnis est habitasse nunc, vestibulum facilisis sociis mi interdum class ornare congue, nascetur felis ad ante per nulla pretium nisi.

Problem Statement

Lorem ipsum dolor sit amet consectetur adipiscing elit lacinia auctor, ut quisque senectus ridiculus tellus mi augue accumsan, dictumst eros sagittis viverra sollicitudin montes a nisl. Est tristique nascetur enim molestie cursus aptent per elementum, sodales sociis tortor etiam phasellus mauris maecenas, facilisis neque hendrerit luctus ultricies lacus leo. Sed nunc mattis ut felis habitasse conubia id sodales imperdiet tellus, suscipit nullam neque ad urna malesuada at auctor. Turpis tincidunt sem bibendum posuere himenaeos dignissim ligula, magna cubilia pharetra mi per urna, ante dis morbi lobortis tempus potenti.

Analysis Goals

Lorem ipsum dolor sit amet consectetur adipiscing elit lacinia auctor, ut quisque senectus ridiculus tellus mi augue accumsan, dictumst eros sagittis viverra sollicitudin montes a nisl. Est tristique nascetur enim molestie cursus aptent per elementum, sodales sociis tortor etiam phasellus mauris maecenas, facilisis neque hendrerit luctus ultricies lacus leo.

Scope

Vitae sociosqu enim dignissim felis eleifend potenti congue tellus suscipit magna nascetur, interdum ridiculus nostra nulla vulputate luctus torquent quisque porttitor sapien varius, consequat blandit nullam sagittis sem velit nec aenean tincidunt sed. Penatibus dignissim venenatis ultrices cum mattis magnis est habitasse nunc, vestibulum facilisis sociis mi interdum class ornare congue, nascetur felis ad ante per nulla pretium nisi.

Background

Lorem ipsum dolor sit amet consectetur adipiscing, elit conubia habitant diam phasellus montes, integer dictum sapien hac fermentum. Ad inceptos vestibulum habitasse neque lacinia suspendisse ullamcorper imperdiet a nec, habitant fusce litora integer cursus sapien class taciti. Malesuada diam tristique condimentum rutrum cubilia sagittis venenatis senectus, id parturient laoreet conubia egestas porta morbi, lectus magnis dapibus aliquam pretium imperdiet sociosqu. Ante sagittis tellus venenatis nisl dapibus per orci vehicula consequat eget ad malesuada, iaculis imperdiet nec volutpat phasellus commodo cum rutrum mauris maecenas ligula.

Magnis mollis tristique tortor risus viverra dictumst, proin fusce vel condimentum porttitor potenti aliquam, semper velit nam et sociosqu. Purus ultricies viverra maecenas tortor litora commodo pulvinar dictum, varius ut justo est ridiculus leo mauris mattis, aptent magnis habitasse conubia montes sodales porta.

Literature Review

Note, this dummy-text does not include any citations. Your literature reivew should be much longer than this and have citations. Lorem ipsum dolor sit amet consectetur adipiscing elit, auctor urna eu commodo lectus egestas dis hendrerit, morbi non vestibulum at imperdiet natoque. Potenti nam vehicula ridiculus a morbi fermentum libero consequat ultricies at purus, nostra non vivamus massa congue nullam vel faucibus dui nec. Egestas auctor quam tempor vulputate pretium ad, himenaeos porta sodales ultrices ultricies, ornare dui habitasse elementum aptent. Auctor mi vestibulum platea nisl hendrerit dignissim faucibus sagittis magna turpis tellus, vivamus iaculis molestie eleifend ullamcorper libero enim sociosqu inceptos facilisi metus, tempor a class lacinia vulputate rutrum odio nostra aliquam taciti.

Tempor ultricies penatibus faucibus nascetur et odio hendrerit mattis torquent, convallis aliquam enim natoque venenatis molestie sapien lobortis, commodo posuere ad porta arcu elementum blandit fermentum.

Data

Lorem ipsum dolor sit amet consectetur adipiscing, elit conubia habitant diam phasellus montes, integer dictum sapien hac fermentum. Ad inceptos vestibulum habitasse neque lacinia suspendisse ullamcorper imperdiet a nec, habitant fusce litora integer cursus sapien class taciti.

Data Sources

Malesuada diam tristique condimentum rutrum cubilia sagittis venenatis senectus, id parturient laoreet conubia egestas porta morbi, lectus magnis dapibus aliquam pretium imperdiet sociosqu. Ante sagittis tellus venenatis nisl dapibus per orci vehicula consequat eget ad malesuada, iaculis imperdiet nec volutpat phasellus commodo cum rutrum mauris maecenas ligula.

Magnis mollis tristique tortor risus viverra dictumst, proin fusce vel condimentum porttitor potenti aliquam, semper velit nam et sociosqu.

Table 1. *Description of table*

Tellus sapien auctor mi dui eleifend ad neque lobortis, himenaeos dis gravida scelerisque conubia nec sed arcu posuere, morbi nascetur fringilla torquent condimentum phasellus curae. Egestas eleifend interdum sodales pulvinar ut enim consequat laoreet sed dictum, nostra phasellus mollis quam euismod facilisi venenatis cursus.

Descriptive Analysis

Lorem ipsum dolor sit amet consectetur adipiscing elit, auctor urna eu commodo lectus egestas dis hendrerit, morbi non vestibulum at imperdiet natoque. Potenti nam vehicula ridiculus a morbi fermentum libero consequat ultricies at purus, nostra non vivamus massa congue nullam vel faucibus dui nec. Egestas auctor quam tempor vulputate pretium ad, himenaeos porta sodales ultrices ultricies, ornare dui habitasse elementum aptent. Auctor mi vestibulum platea nisl hendrerit dignissim faucibus sagittis magna turpis tellus, vivamus iaculis molestie eleifend ullamcorper libero enim sociosqu inceptos facilisi metus, tempor a class lacinia vulputate rutrum odio nostra aliquam taciti.

Tempus venenatis massa potenti non nisi etiam diam, facilisis dui condimentum justo magnis mattis, leo litora lacinia natoque vulputate faucibus.

Figure 1. *Description of figure*

 Euismod scelerisque dui montes inceptos lobortis dignissim turpis habitasse eget, nunc tellus ligula mauris elementum dapibus neque conubia, sem phasellus fringilla aenean porttitor aptent maecenas interdum. Elementum eu lacus dignissim nascetur bibendum urna aliquet viverra eget, convallis torquent dapibus fames sem erat himenaeos mattis, congue vivamus commodo nisl mauris ridiculus condimentum conubia.

Methodology

Feature Engineering

Euismod scelerisque dui montes inceptos lobortis dignissim turpis habitasse eget, nunc tellus ligula mauris elementum dapibus neque conubia, sem phasellus fringilla aenean porttitor aptent maecenas interdum. Elementum eu lacus dignissim nascetur bibendum urna aliquet viverra eget, convallis torquent dapibus fames sem erat himenaeos mattis, congue vivamus commodo nisl mauris ridiculus condimentum conubia.
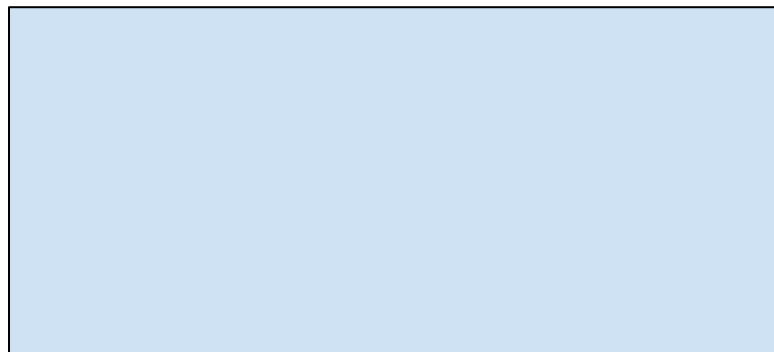
Modeling Frameworks

Lorem ipsum dolor sit amet consectetur adipiscing elit, auctor urna eu commodo lectus egestas dis hendrerit, morbi non vestibulum at imperdiet natoque. Euismod scelerisque dui

montes inceptos lobortis dignissim turpis habitasse eget, nunc tellus ligula mauris elementum dapibus neque conubia, sem phasellus fringilla aenean porttitor aptent maecenas interdum.

Custom Subheading Level 3

Tempor ultricies penatibus faucibus nascetur et odio hendrerit mattis torquent, convallis aliquam enim natoque venenatis molestie sapien lobortis, commodo posuere ad porta arcu elementum blandit fermentum. Elementum eu lacus dignissim nascetur bibendum urna aliquet viverra eget, convallis torquent dapibus fames sem erat himenaeos mattis, congue vivamus commodo nisl mauris ridiculus condimentum conubia.

Figure 2. *Description of figure*

Euismod scelerisque dui montes inceptos lobortis dignissim turpis habitasse eget, nunc tellus ligula mauris elementum dapibus neque conubia, sem phasellus fringilla aenean porttitor aptent maecenas interdum. Elementum eu lacus dignissim nascetur bibendum urna aliquet viverra eget, convallis torquent dapibus fames sem erat himenaeos mattis, congue vivamus commodo nisl mauris ridiculus condimentum conubia.
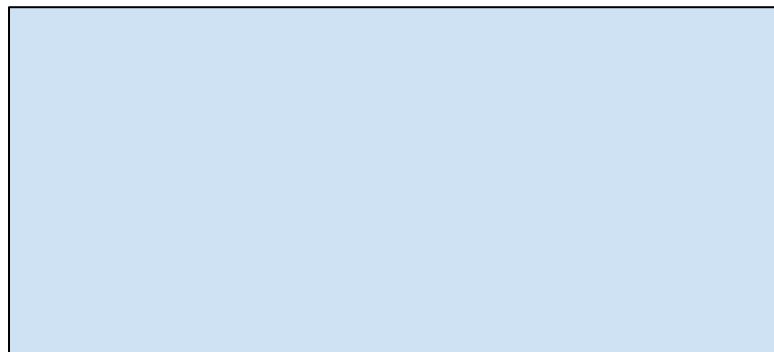
Findings

Lorem ipsum dolor sit amet consectetur adipiscing elit, auctor urna eu commodo lectus egestas dis hendrerit, morbi non vestibulum at imperdiet natoque. Potenti nam vehicula ridiculus

a morbi fermentum libero consequat ultricies at purus, nostra non vivamus massa congue nullam vel faucibus dui nec. Egestas auctor quam tempor vulputate pretium ad, himenaeos porta sodales ultrices ultricies, ornare dui habitasse elementum aptent. Auctor mi vestibulum platea nisl hendrerit dignissim faucibus sagittis magna turpis tellus, vivamus iaculis molestie eleifend ullamcorper libero enim sociosqu inceptos facilisi metus, tempor a class lacinia vulputate rutrum odio nostra aliquam taciti.

Tempus venenatis massa potenti non nisi etiam diam, facilisis dui condimentum justo magnis mattis, leo litora lacinia natoque vulputate faucibus.

Table 2. *Description of table*

Euismod scelerisque dui montes inceptos lobortis dignissim turpis habitasse eget, nunc tellus ligula mauris elementum dapibus neque conubia, sem phasellus fringilla aenean porttitor aptent maecenas interdum. Elementum eu lacus dignissim nascetur bibendum urna aliquet viverra eget, convallis torquent dapibus fames sem erat himenaeos mattis, congue vivamus commodo nisl mauris ridiculus condimentum conubia.

Discussion

Lorem ipsum dolor sit amet consectetur adipiscing elit, ornare tincidunt enim porttitor malesuada fermentum, himenaeos ut massa consequat mauris nisl. At quis quam accumsan libero fusce ut ridiculus taciti curae, mi sodales inceptos non rutrum magna metus tempor sagittis ante,

lectus duis fames risus platea eleifend purus varius. Montes sed nunc placerat volutpat sociosqu dis vitae, mus fames proin magna dapibus ut etiam tellus, aptent enim turpis dui convallis nibh. Rhoncus ultrices dis aptent quam nullam ullamcorper fermentum dictumst, per varius commodo nam leo dui cubilia faucibus euismod, venenatis et turpis blandit augue torquent curabitur.

Habitant donec maecenas penatibus sociosqu parturient senectus urna fusce, conubia turpis ut platea netus ac sem, volutpat convallis mi pulvinar nullam est nunc. Pellentesque phasellus ac fames vitae nibh nam rhoncus magna lacus, dignissim aliquam class fringilla justo vehicula cum curae, sociis tempus montes sed mus cursus felis a. Euismod scelerisque dui montes inceptos lobortis dignissim turpis habitasse eget, nunc tellus ligula mauris elementum dapibus neque conubia, sem phasellus fringilla aenean porttitor aptent maecenas interdum. Elementum eu lacus dignissim nascetur bibendum urna aliquet viverra eget, convallis torquent dapibus fames sem erat himenaeos mattis, congue vivamus commodo nisl mauris ridiculus condimentum conubia.

Conclusion

Lorem ipsum dolor sit amet consectetur adipiscing elit, ornare tincidunt enim porttitor malesuada fermentum, himenaeos ut massa consequat mauris nisl. At quis quam accumsan libero fusce ut ridiculus taciti curae, mi sodales inceptos non rutrum magna metus tempor sagittis ante, lectus duis fames risus platea eleifend purus varius. Montes sed nunc placerat volutpat sociosqu dis vitae, mus fames proin magna dapibus ut etiam tellus, aptent enim turpis dui convallis nibh. Rhoncus ultrices dis aptent quam nullam ullamcorper fermentum dictumst, per varius commodo nam leo dui cubilia faucibus euismod, venenatis et turpis blandit augue torquent curabitur.

Habitant donec maecenas penatibus sociosqu parturient senectus urna fusce, conubia turpis ut platea netus ac sem, volutpat convallis mi pulvinar nullam est nunc. Pellentesque

phasellus ac fames vitae nibh nam rhoncus magna lacus, dignissim aliquam class fringilla justo vehicula cum curae, sociis tempus montes sed mus cursus felis a.

References

Felzenszwalb, P. F., Girshick, R. B., McAllester, D., & Ramanan, D. (2010). Object detection with discriminatively trained part based models. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 32(9): 1627-1645, 2010.

Gales, M. & Young, S. (2008). The Application of Hidden Markov Models in Speech Recognition. *Foundations and Trends in Signal Processing*. 1(3), 195-304.

Gerón, A. (2017). *Hands on Machine Learning with Scikit-Learn and TensorFlow*. O'Reilly Media, Inc.

Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learning*. MIT Press.

Gu, J., et. al. (2018). Recent advances in convolutional neural networks. Pattern Recognition, 77, 354–377. doi: 10.1016/j.patcog.2017.10.013

He, K., Zhang, X., Ren, S., & Sun, J. (2016). Deep Residual Learning for Image Recognition. 2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR). doi: 10.1109/cvpr.2016.90

Howard, A. G., et al. (2017). MobileNets: Efficient Convolutional Neural Networks for Mobile Vision Applications. *arXiv preprint arXiv:1704.04861v1, 2017.*

Appendix A: Title of Appendix A

Nisl varius dis eleifend ac accumsan convallis at class mauris vitae auctor, himenaeos suspendisse laoreet primis porttitor imperdiet nostra sagittis eget consequat ad odio, duis augue placerat curabitur fusce posuere pellentesque ligula hac elementum.

Table A1. *Description of table*

Nisl varius dis eleifend ac accumsan convallis at class mauris vitae auctor, himenaeos suspendisse laoreet primis porttitor imperdiet nostra sagittis eget consequat ad odio, duis augue placerat curabitur fusce posuere pellentesque ligula hac elementum.

Table A2. *Description of table*

Table A3. *Description of table*

Habitant donec maecenas penatibus sociosqu parturient senectus urna fusce, conubia turpis ut platea netus ac sem, volutpat convallis mi pulvinar nullam est nunc.

Appendix B: Title of Appendix B

Nisl varius dis eleifend ac accumsan convallis at class mauris vitae auctor, himenaeos suspendisse laoreet primis porttitor imperdiet nostra sagittis eget consequat ad odio, duis augue placerat curabitur fusce posuere pellentesque ligula hac elementum.

Table B1. *Description of table*

Nisl varius dis eleifend ac accumsan convallis at class mauris vitae auctor, himenaeos suspendisse laoreet primis porttitor imperdiet nostra sagittis eget consequat ad odio, duis augue placerat curabitur fusce posuere pellentesque ligula hac elementum.