Documentation Guidelines
Season 2025—III
Course Project

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This is not an official guideline, but rather some *recommendations* based on my *experience* and *interactions* (both good and bad) with *conference* and *journal* submissions.

How to write a paper?

A paper is a summary of a *research project*, providing enough *details* for anyone to understand the *problem*, the *solution*, and the *results*, so that your research can be *replicated*. A good paper, in `IEEE format`, should not exceed *5–6 pages*, including the *bibliography*. You should use an appropriate amount of *images*, *tables*, and similar components to support your explanations.

Sections of a paper are:

- **Title:** It should be an *attractive* but *simple* name. Not too long, but *clear* about the paper's *goal*. Remember to include the *authors'* names with full *affiliations*.
- **Abstract:** It should be just *one paragraph*, with *three main sentences*. These sentences should answer: *(i)* what is the *context* of the problem? *(ii)* what do you *propose* as a solution for the problem? *(iii)* what are the *relevant results* of your work?. Ensure your abstract is `understandable` without reading the rest of the paper. Avoid *technical jargon* and acronyms unless absolutely necessary.
- **Introduction:** This should be a section of about *one page*. Here, the *context* of the problem should be *fully described*. Also, *previous solutions* to the same problem should be *referenced*. Most of the *bibliography* is cited here. While referencing previous solutions, you can also mention *computational techniques* used, which provides

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a complete reference for the reader. Usually, this section does not include *images* or *tables.*

- **Methods and Materials:** Here you should describe the *design* of your solution, your *technical decisions*, and why you believe your solution is *appropriate.* Some general *images* are recommended to enhance your explanation, and this section is expected to be *1 to 2 pages* long. It is not recommended to include *code* here, but if you are presenting a *complex algorithm*, you may add it. Remember to write *full paragraphs*, with *one idea per paragraph*, and avoid using itemized lists. Aim for *clarity* and *readability.* Include enough detail for *reproducibility.* Briefly mention any *limitations* or *assumptions* in your approach.

- **Results & Discussion:** Explain the *experiments* you performed to demonstrate that your solution works. Summarize your *unit tests* in a paragraph, mentioning their *philosophy*, *quantity*, and *results.* Also, discuss any *integration* and *acceptance tests* to address *software quality* and user expectations. If possible, compare your results with other solutions using *metrics.* Use *tables* to summarize test definitions and results, and *charts* (such as box-plots or time series) for comparisons, depending on your project. *Highlight* the most important *findings.* Every figure and table must have a *descriptive caption* and be `referenced in the text`.

- **Conclusions:** Write a couple of paragraphs to *summarize* your work, results, and achievements. Clearly state why your work was *successful* and how it helped to *solve the problem.* End with suggestions for *future work* or open questions that remain.

- **Bibliography:** Just the *references.* In LaTeX, you can use the *bibliography environment* to automatically number and manage your references, or use tools like *Mendeley* or *Zotero* to generate a *.bib* file. Remember to cite all references in the *Introduction* section, and only there. Ensure all references are *cited* in the text and *formatted consistently.*

- **Acknowledgments:** This is an optional section where you can mention any *funding sources* or *collaborators* who contributed to your work.

How to make a poster?

A poster is a concise visual summary of your *research*, designed to communicate your work *quickly* and *clearly*. Think of it as a visually appealing summary of your paper, organized into *blocks*. In general, a poster has the same sections as a paper but with *minimal text*.

The typical size is about *1.5 meters high* and *1 meter wide*. Use *high-resolution* images and clear, readable charts. Avoid clutter and ensure all visuals are labeled. Organize content in columns or blocks for easy reading. Maintain consistent font sizes and colors.

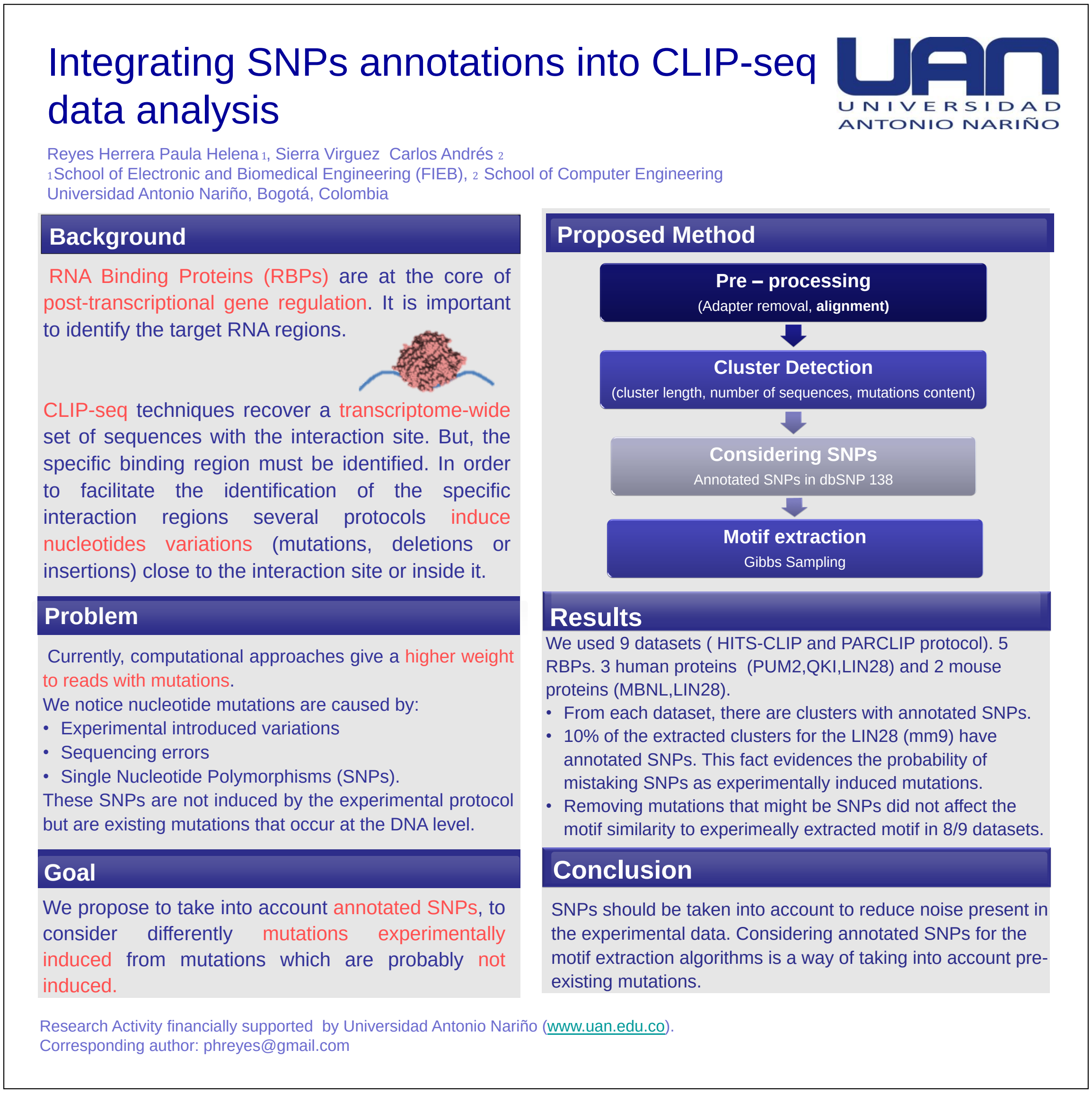
The sections of a poster are:

- **Introduction:** One *paragraph* about the *problem* to solve, the most relevant *previous solutions*, and the main *challenges*.
- **Goal:** The main *goal* of your work. Usually, this is *two sentences*: the *research question* and the *expected final product*.
- **Proposed Solution:** One *drawing* and a short *paragraph* describing your solution, its general *architecture*, and main *technical considerations*.

These three sections typically take up about half of the poster space.

- **Experiments:** A few *paragraphs* describing the *experiments* you performed to demonstrate your solution works. Include *tables* to describe your tests.
- **Results:** Use *tables* or *charts* to summarize your *results*, compare with previous solutions, and explain the *strengths* and *weaknesses* of your work.
- **Conclusions:** A short *paragraph* describing how you achieved (or did not achieve) your goal and how the *research question* was answered.
- **Bibliography:** List the main *2–3 references* cited in the poster.

Below are some examples of posters:



Difference between annotations from RBP motifs and CLIP-seq clusters

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Introduction

RNA-binding proteins **(RBPs)** are at the core of **post-transcriptional regulation**. To understand each RBP specific function, we must identify the RNA targets by locating the regions where the RBP binds (**motifs**).

Experimental techniques, such as SELEX, RIP-CHIP and CLIP (UV crosslinking and immunoprecipitation), are used to determine **RBPs binding sites.**

Recently, **CLIP-seq** protocols (HITS-CLIP, PAR-CLIP, iCLIP) recover a transcriptome-wide set of sequences with the interaction site.

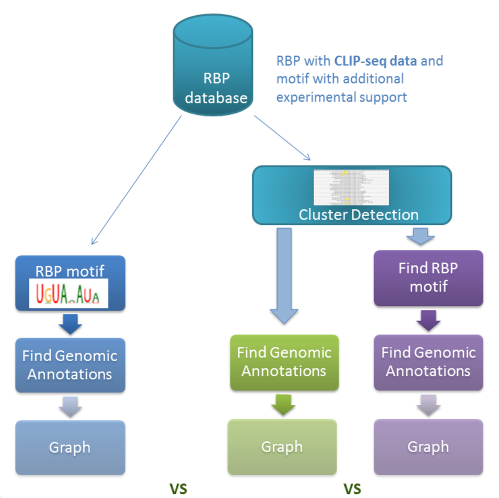
Goal

We compared the **genomic annotations of RBP motifs** with **CLIP-seq clusters annotations**. The goal of this study is to identify differences in the annotations and provide support CLIP-seq data reliability.

Methods

We built a database with different sources of experimental data for RBPs such as **RNAcompete** and **CLIP-seq**

In addition, we developed a tool in **python and MySQL**, that looks for RBP motif annotations in the **UCSC** annotations database. Moreover, we used the following workflow to make the aforementioned comparison.



Results

We found **notable differences** that suggest sequence motif is not enough to predict the regions where the RBP binds. We present PUM2 **annotations** obtained with the **3 mentioned procedures**.

We observed notable differences for the PUM2 RBP transcript regional preferences in the 3 mentioned procedures (see Methods). However, this behavior is **extended** to a bigger set of proteins not presented here for space reasons. In particular, for the PUM2 we observe a change between the exonic and intronic preferences. Moreover, we observed in the PAR-CLIP dataset several regions are in 3'UTR consistently with previous PUM2 studies.

Future directions

It is important to study in detail the sequences that are annotated differently from the CLIP-seq data to identify characteristics that can be used to recognize possible false positives.

References

[1] Hafner, M., et al (2010) Transcriptome-wide identification of RNA-binding protein and microRNA target sites by PAR-CLIP. Cell (141)
[2] Ray, D. et al (2013). A compendium of RNA-binding motifs for decoding gene regulation. Nature, 499.

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How to make a technical report?

A technical report is a document that describes the *process*, *progress*, or *results* of technical or scientific research. It is a formal record of the work done and is often used to communicate *findings* to *stakeholders*, *sponsors*, or the *scientific community*.

The `structure` of a technical report may vary depending on the organization or field, use *clear section headings* and a *logical flow*. Start with *context*, then *methods*, *results*, and *discussion*. But it typically includes the following sections:

- **Title Page:** The *title page* includes the *title* of the report, the *author's name*, the *date*, and any relevant *affiliations* or *organizations*.
- **Abstract:** A brief *summary* of the report, including the *purpose*, *methods*, *results*, and *conclusions*. It should be concise and provide a clear overview of the content.
- **Introduction:** This section provides *background information* on the topic, the *problem* being addressed, and the *objectives* of the report. It sets the *context* for the research and explains why it is important.
- **Literature Review:** A review of *existing research* and *literature* related to the topic. This section may include a summary of key findings, theories, and methodologies used in previous studies. It helps to establish the *context* for the current research and identifies gaps in knowledge.
- **Background:** A section that provides *additional context* or *information* necessary to understand the report. This may include *relevant* theories, concepts, or technical details.
- **Objectives:** A clear statement of the *goals* or *objectives* of the research. This section outlines what the report aims to achieve and what specific questions it seeks to answer.
- **Scope:** A description of the *boundaries* of the research, including what is included and excluded from the study. This section helps to clarify the focus of the report and sets expectations for the reader.
- **Assumptions:** A list of any *assumptions* made during the research. This may include assumptions about the data, methods, or context of the study. Clearly stating assumptions helps to clarify the limitations of the research.
- **Limitations:** A discussion of any *limitations* or *constraints* that may have affected the research. This may include limitations related to data availability, methodology, or external factors. Acknowledging limitations helps to provide a more accurate interpretation of the results and their implications.
- **Methodology:** A detailed description of the *methods* and *procedures* used in the research. This may include *experimental design*, *data collection techniques*, and *analysis methods*. It should be clear enough for others to *replicate* the study. Include `diagrams` or `flowcharts` to illustrate complex *processes* or *system architectures*.

- **Results:** Presentation of the *findings* of the research. This section may include *tables*, *figures*, and *graphs* to illustrate the data. The results should be presented clearly and objectively.
- **Discussion:** Interpretation of the *results* and their *implications.* This section discusses the significance of the findings, how they relate to previous research, and any *limitations* or *uncertainties.* Directly *link results* to your *objectives.* Discuss implications and limitations.
- **Conclusion:** A summary of the main *findings* and their *implications.* This section may also include *recommendations* for future research or practical applications.
- **References:** A list of all the *sources* cited in the report. This section should follow a specific *citation style* (e.g., APA, MLA, IEEE) and include all relevant information for each source.
- **Appendices:** Additional *material* that supports the report but is not essential to the main text. This may include *raw data*, *detailed calculations*, or *supplementary information.*
- **Acknowledgements:** A section to thank *individuals* or *organizations* that contributed to the research or provided support.
- **Glossary:** A list of *terms* and *acronyms* used in the report, along with their definitions. This is especially useful for technical reports that may include specialized terminology.
- **Table of Contents:** A list of the main *sections* and *subsections* of the report, along with their page numbers. This helps readers navigate the document.
- **List of Figures/Tables:** A list of all *figures* and *tables* included in the report, along with their titles and page numbers. This helps readers locate visual aids quickly.

Here is a recommended template for a technical report: Overleaf - MSc UoR Computer Science Report Template and Guide

How to make presentation slides?

A presentation slide is a visual aid used to convey *information* during a presentation. It typically includes *key points*, *images*, and *graphics* to support the speaker's message. Here are some tips for creating effective presentation slides:

- **Keep it simple:** Avoid cluttering slides with too much *text* or too many *images*. Aim for *clarity* and *focus*.
- **Use visuals:** Incorporate *images*, *charts*, and *graphs* to illustrate your points and make the content more engaging.
- **Limit text:** Use *bullet points* and *short phrases* instead of long paragraphs. This helps the audience quickly grasp the main ideas.
- **Consistent design:** Use a consistent *color scheme*, *font style*, and *layout* throughout your slides to create a professional appearance.
- **Practice:** Rehearse your presentation to ensure *smooth delivery* and to familiarize yourself with the content of your slides.
- **Feedback:** After the presentation, seek *feedback* to improve future presentations.

There are no strict rules for the number of slides, but a good guideline is to have *one slide per minute* of presentation time. The most important thing is to have a *clear structure* and *flow* about your project, so the audience can understand the *problem*, the *analysis*, the *solution*, and the *results*.

Follow a `clear outline`: *Problem*, *Solution*, *Results*, *Conclusions*. Each slide should have a clear purpose. Some additional tips for creating effective presentation slides:

- **Use a clear font:** Choose a *legible font* that is easy to read from a distance. Avoid overly decorative fonts.
- **Use high-contrast colors:** Ensure that the *text* stands out against the *background*. High-contrast color combinations (e.g., dark text on a light background) improve readability.
- **Limit animations:** Use *animations* and *transitions* sparingly. Too many effects can distract the audience and detract from your message.
- **Engage the audience:** Encourage *questions* and *interaction* during your presentation. This helps keep the audience engaged and allows for clarification of complex points.
- **Use speaker notes:** If your presentation software allows it, use *speaker notes* to remind yourself of key points to discuss. This can help you stay on track during your presentation.
- **Test your equipment:** Before the presentation, test the *projector*, *microphone*, and any other equipment you'll be using. Ensure that everything works properly to avoid technical issues.

- **Be mindful of time:** Keep track of your *time* during the presentation. Practice your timing to ensure you cover all key points without rushing or going over time.
- **End with a strong conclusion:** Summarize your main points and leave the audience with a *clear takeaway message*. A strong conclusion reinforces the key ideas and helps the audience remember your presentation.
- **Provide handouts:** If appropriate, consider providing *handouts* or *supplementary materials* to the audience. This allows them to review the content later and reinforces your message.
- **Use a consistent layout:** Maintain a consistent *layout* for each slide, including title placement, bullet point alignment, and image positioning. This creates a cohesive look and makes it easier for the audience to follow along.
- **Practice with a timer:** Rehearse your presentation with a *timer* to ensure you stay within the allotted time. This helps you gauge the pacing of your delivery and allows you to make adjustments if needed.
- **Be prepared for questions:** Anticipate potential *questions* from the audience and prepare thoughtful responses. This demonstrates your expertise and helps clarify any uncertainties.
- **Use a backup:** Save your presentation on *multiple devices* or *cloud storage* to avoid technical issues. Having a backup ensures you can access your slides in case of equipment failure.
- **Stay calm and confident:** Remember that you are the *expert* on your topic. Take deep breaths, maintain eye contact, and speak clearly. Confidence in your delivery will help engage the audience and convey your message effectively.