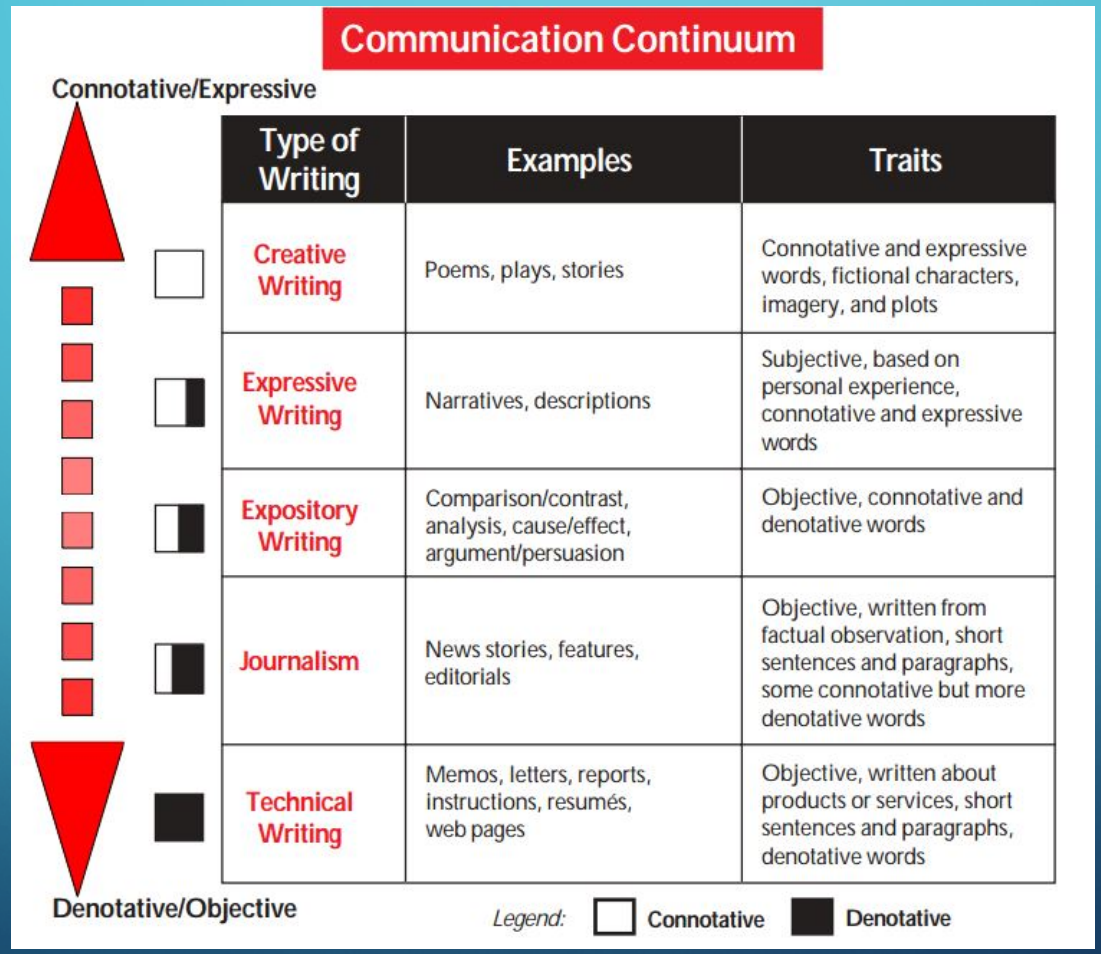
DEMYSTIFYING WRITING FOR COMPUTER SCIENCE MAJORS

A BREAKDOWN OF TECHNICAL WRITING AND TIPS FOR A BETTER RESEARCH PAPER

WHAT ARE WE GOING TO TALK ABOUT TODAY?

- What is Technical Writing
- What are the parts of a research paper
- General tips for writing stronger reports

WHAT IS TECHNICAL WRITING



Type of Writing	Examples	Traits
Creative Writing	Poems, plays, stories	Connotative and expressive words, fictional characters, imagery, and plots
Expressive Writing	Narratives, descriptions	Subjective, based on personal experience, connotative and expressive words
Expository Writing	Comparison/contrast, analysis, cause/effect, argument/persuasion	Objective, connotative and denotative words
Journalism	News stories, features, editorials	Objective, written from factual observation, short sentences and paragraphs, some connotative but more denotative words
Technical Writing	Memos, letters, reports, instructions, resumés, web pages	Objective, written about products or services, short sentences and paragraphs, denotative words

AUDIENCE AND PURPOSE

- What is the purpose of Technical Writing?
  - To convey highly technical information to a wide audience
  - To provide incredibly specific information in a succinct and concise manner
- Who is the audience
  - Engineers, scientists, computer scientists, and some business people
  - Busy Busy Busy professionals

LET'S TAKE A CLOSER LOOK

- Time is a river flowing from nowhere through which everything and everyone move forward to meet their fate.
- Time is a convention of measurement based on the microwave spectral line emitted by cesium atoms with an atomic weight of 133 and an integral frequency of 9,192,631,770 hertz.
- Technical writing is to the point, is professional, contains specific and accurate information, and is able to be widely understood per your field.

A FEW THINGS TO REMEMBER

- Technical writing is heavily dependent on the intended audience. Always keep them in mind when writing.
- Just because sentences are short and straight forward, doesn't make them "bad".
- When in doubt don't forget to KISS: Keep it short and simple.

WHAT ARE PARTS OF A PAPER YOU MIGHT WRITE

- Abstract
- Keywords
- Introduction and scope
- Background (may also go by other names)
- Methods, Data, and Discussion
- Results and/or conclusions
- Acknowledgments

WHAT ARE THE VARIOUS PARTS OF A PAPER?

- Abstract
  - Descriptive abstracts (also called limited abstracts) present the information of the paper without giving away too much substance. Usually this does not include the "results" and is less than 50 words. *These are not as common.*
  - Informative abstracts (or complete abstracts) actually summarizes the entire report, including the results sections. It doesn't just merely list the table of contents in paragraph form like a descriptive abstract. These are comprehensive but only around 200 words (this word count will vary).

ABSTRACTS AND KEYWORDS

- An abstract is a summary with spoiler alerts. Think about the purpose of an abstract.
- Keywords are words or short phrases used by search engines to aid other students/researchers in finding your paper. You'll only need to list a few and they'll need to be specific but also broad.
- For example, if your paper is on macular degeneration and how a Mediterranean diet can help, you might list the following for keywords: Mediterranean, Macular, Nutrition, age related ocular disease, cholesterol

INTRODUCTION AND SCOPE

- Introduction
  - Introductions introduce the entire project, or report to the reader. It's a great opportunity to define terms and acronyms you'll be using, while giving the reader a brief look at what will follow. Introductions can include purpose statements, problem information (if one is required), and necessary background information.
- Scope
  - Sometimes this is in the introduction. It established what you will and what you won't be discussing. Also called limitations.

BACKGROUND AND LITERATURE REVIEW

- Background
  - This is one of the most important parts of your report because it answers the question “so what”, or the significance of the experiment
  - Tells the reader what existing studies have been conducted
- Literature review
  - A review of the existing literature related to what you’re writing about
  - Answers why the author of the paper used these articles as part of their research
  - Acknowledges how there are gaps in the existing research and how the author will attempt to cover those gaps.

METHODS, RESULTS, AND DISCUSSION

- Methods (if you're doing the research yourself)
  - Tell the reader in detail how you conducted the research. Be as specific as possible.
- Results/Data
  - Provide data from the research to the reader. Remember the rule regarding labeling tables and figures: Label tables on top, figures on the bottom.
  - Data is plural
  - Remember to be consistent with abbreviations. For example, use "Wb/m2" or "webers per square meter", and not "webers/m2"
- Discussion
  - This is your opportunity to interpret the information for the reader and advise for the next steps needed to be taken.
  - Be honest and acknowledge the holes you had in your research and how it effected the outcome. Propose how changes or different circumstances could affect the outcome.

CONCLUSION AND ACKNOWLEDGMENTS

- Conclusion
  - Dun dun dun
  - This is a great space to summarize the entirety of the report
  - This is great space to revisit the question “so what” and potentially offer suggestions for further research
- Acknowledgments aren’t in every research paper but it’s a great way to let the reader know who helped you in your research and/or writing of the report

GENERAL TIPS FOR STRONGER REPORTS

- Maintain a consistent use of tenses (i.e. past and present tenses)
- When using tables and figures remember to caption/label them appropriately
  - Tables are always labeled above the table
  - Figures are always labeled below the figure
  - Table top
- The significance of the report is ALWAYS important

GENERAL TIPS FOR STRONGER REPORTS

- Paraphrase, Paraphrase, Paraphrase
  - Remember that you're the one writing and the reader wants to read your ideas and discoveries
  - In STEM writing, quoting is not really used *ever*.
  - True or False: If I paraphrase instead of direct quoting, I don't have to provide citations or give reference.

GENERAL TIPS FOR STRONGER REPORTS

- The word “essentially” should not be used to mean “approximately” or “effectively”
- Avoid using the term “done”
- Imply versus infer
  - Imply means to hint at something and infer means to make an educated guess

GENERAL TIPS FOR STRONGER REPORTS

- Remember the purpose of what your writing
- Strategy: imagine the reader is the laziest person ever, make the connections for them
- Remember that scientific communication isn't always just for your colleagues or other scientists
  - Stratedgy: Think BIGGER about scientific communication
  - Mishaps in communication can be dangerous, even deadly

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