

# Writing Research Reports

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## Overview

- A research report is an academic paper that serves to provide the reader with a great deal of information about a specific topic.
- Conducting a substantial amount of research on a selected problem for a certain period of time leads to a research report.
- A research report contributes to enhancing the existing knowledge leading to publications.

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## Structure of a research report

- |                |                          |
|----------------|--------------------------|
| ■ Title        | ■ Introduction           |
| ■ Authors      | ■ Methodology            |
| ■ Affiliations | ■ Implementation         |
| ■ Abstract     | ■ Results and Discussion |
| ■ Keywords     | ■ Conclusions            |
| ■ Header       | ■ Acknowledgments        |
| ■ Footer       | ■ References             |
|                | ■ Annexures              |

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## Title Page

- Title of the report, Name of authors, Affiliations
- Advice: Do not pick very long titles!
- An investigation of the knowledge of simple mathematics of G.C.E. (A/L) science students with the aim of producing a text book on mathematics specially dedicated to A/L science students
- Spectroscopic Observations of Novae V1065 CENTAURI and V1280 SCORPII using 45 cm Cassergrain Telescope at Arthur C. Clarke Institute, Sri Lanka

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## Title Page ...

### Neural Network Model for Rainfall Forecasting

Akila Kumarasiri  
Department of Physics, University of Colombo

Abstract text

Keywords:

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## Abstract

- An abstract is a short summary of the research work. Abstract simply provide information to the reader to learn quickly about the research.
- Abstracts must include sufficient information to explain to the readers the significance of the research, major findings and implications.
- A good abstract is concise, readable, and quantitative. Length of abstracts should be less than 250 words (1/3 of a page) organized within few paragraphs.

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## Abstract ...

**Abstract .** Electric radiation fields produced by lightning cloud flashes have been analysed using Fourier methods to obtain amplitude spectra for frequencies in the range of 20 kHz to 20 MHz. Time to thunder measurements were used to extract the distances to the cloud flashes from the measurement site. The spectra were generated by analysing the first 10ms time window of cloud flashes with 10 ns sampling resolution and they show  $f^{-1}$  frequency dependence up to 2 MHz followed by  $f^{-2}$  dependence and higher for frequencies above 2 MHz. The results agree very well with previous measurements carried out for individual pulses produced by various lightning processes. By utilizing digital filters it has been shown that measurements taken with narrow band filters do agree with the results produced under wide band measurements.

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## Abstract ...

- Do not refer in the abstract, the information that is not given in the report.
- Abstract should stand on its own. Avoid including references to other literature and tables or figures or equations in the report.
- Be explicit.
- Avoid using “I” or “We”.
- Avoid using trade names, acronyms, abbreviations, or symbols.
- In science, results should be quantified.

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## General format

- Select **Times New Roman** as the default font.
- The title of the paper should be in size 20 and the rest of the text in size 12.
- Section headings should be numbered 1, 2, 3 etc with capital letters.
- Capitalise only the first letter of each word for sub-headings and use 1.1, 1.2 etc to number the sub-headings.
- Leave double space before section headings. Use single spacing everywhere else.
- Total number of pages should be between 10-12.

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## Header / Footer

- Header text – Masters in Applied Electronics (2015)
- Footer text – Title of the paper

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## Introduction

- Introduction should provide a short overview to the subject. Related background studies leading your problem should be included. Objective of the report should be given at the end of the introduction.
- At the beginning, try to include something interesting to motivate the reader to read your report.
- Proper acknowledgement to the previous work with adequate references are essential for a research report.
- Objective of the work could be brief which may end with a “road map” to the report.

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## Methodology

- Detailed information to allow the reader to assess the reliability of your results.
- Information needed to repeat your experiment by other researches.
- Data, Materials, equipment and procedure.
- Calculations, techniques and calibration.
- Limitations, assumptions, and range of validity.
- Statistical methods, analysis techniques etc.

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## Methodology ...

- Citations in methodology should be limited to data sources and related references to find additional information.
- Do not include description of results.
- You may ask;
- Could someone accurately replicate the study?
- Is there enough information about the instruments?
- If the data is from public domain, can others find the same with the given information?
- Can others repeat the analysis?

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## Plagiarism

- To plagiarize means: to use another person's idea or a part of their work and pretend that it is your own.
- In other words: stealing ideas or words. One can argue that there are no original ideas left and that everybody uses someone else's words at some point.
- But merely using other people's words in itself is not plagiarism. It is only when you leave out the source and take credit it becomes plagiarism.
  
- Do not copy sections of text from other sources directly into your report
- Do not copy figures, diagrams and tables from other sources without acknowledging

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## Example

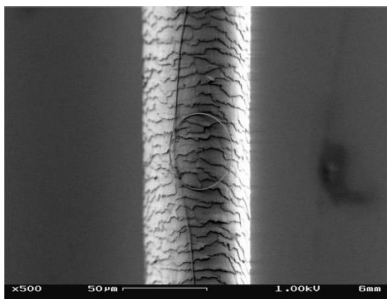


Figure 3.1: Micrograph of a nanowire curled into a loop in front of a strand of human hair. Source: Limin Tong/Harvard University

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## Results and Discussion

- The results are actual statements of observations, including statistics, tables and graphs.
- This section focus on data tables and figures.
- Report negative as well as positive results.
- Present sufficient details so that others cannot draw different opinions and arrive at their own conclusions.
- Use SI units (m, s, kg, etc.) throughout the report.
- Break up your results into logical segments by using subheadings.

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## Results and Discussion ...

Try to develop paragraphs focusing on:

- What are the major patterns in the observations?
- What are the likely causes underlying these patterns resulting predictions?
- Is there agreement or disagreement with previous work?
- Include the evidence or line of reasoning supporting each interpretation.
- What is the significance of the present result?

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## Conclusions

- Refer back to the problem, and describe the conclusions that you reached from carrying out the investigation, summarize new observations, new interpretations, and new insights that have resulted from the work.
- What is the strongest and most important statement that you can make from your observations?
- Include the broader implications of your results.
- Include recommendations and future directions.

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## Acknowledgements

- Do not acknowledge everyone you have come across.
- Acknowledge the advisor/supervisor and give due credit.
- Acknowledge those who made a reasonable contribution in conducting the research work.
- You may acknowledge those who technically, intellectually and financially helped the research work.

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## References

Literature can come from a wide variety of resources.

- ❖ Journal articles (refereed and non-refereed)
- ❖ Conference proceedings (full papers and abstracts)
- ❖ Books
- ❖ White papers (technical notes on web)
- ❖ Reports (eg. WHO)
- ❖ Thesis and Dissertations

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## Annexures

- Reference data/materials not easily available
- Tables (where more than 1-2 pages).
- Calculations (where more than 1-2 pages).
- Screen capture of software programs.
- Details of complicated procedures.

Figures and tables, including captions, should be embedded in the text and not in an appendix, unless they are not critical to your argument.

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## General rules

- Tables should have captions above tables.
- Figures should have captions below figures. Axes should be marked clearly with units.
- Caption should be concise but should have enough details to understand the table/figure without reading the text.
- Do not include floating figures, tables, pictures, etc
- Do not include figures/tables on pages that are far away from the place in text where the references are made.
- Do not list any references that are not cited in the text.

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## Writing the report

- Review other reports before you begin to write.
- Prepare a structure with headings and sub headings to help you organize the report.
- Begin writing the sections you know the best.
- Use bogus names/places in early drafts until you finalize details.
- Use rough drawings of graphics/tables for early drafts.
- Make your writing clear and unambiguous.
- Introduce tables/figures in the text, present the table/figure and then describe it.

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