

Writing a Research Paper

Today:

- **assumptions**
- **algorithm**
- **issues**



Assumptions

- **already have results**
- **specific journal selected**
- **structure and content**
- **pirates' code of honor**



Top Level Structure

- Title Page
 - **Introduction**
 - **Methods**
 - **Results**
 - **Discussion**
 - References
 - Appendices
- } The **IMRAD** method

Introduction

- **key question to answer ...**
 - What** problem was studied, and **why**?
- **sample outline ...**
 - **context and background**
 - **problem and motivation**
 - **goal and what is new**
 - **overview**

Introduction

- **common mistakes ...**
 - **writing at wrong level**
 - **not explicitly explaining innovation**
 - **overstating your case**
 - **insulting the reviewer**



Methods

- **key question to answer ...**
 - How** was the problem studied?
- **method/model/algorithm**
- **experimental procedures**
- **analysis methodology**
- **common mistakes ...**
 - **omission of critical information**
 - key issue: reproducibility**
 - **including results**



Results

- **key question to answer ...**
What were the **findings**?
- **organizing the material**
- **how to present the information**

Results

common mistakes ...

- **tabular rather than visual presentation**
- **excessive data listing or result details**
- **including methods or discussion**

Discussion

- key question to answer ...
What do findings **mean**?
- how to organize ...
 - summary + limitations
 - relate to past work + significance
 - directions for future research
- common mistakes ...
 - include results
 - omit explicit conclusions/significance
 - overstate significance of results



Summary of IMRAD Method

- Introduction
What problem was studied, and **why**?
- Methods
How was the problem studied?
- Results
What were the **findings**?
- Discussion
What do findings **mean**?

Title Page

Title
Authors
Affiliations
Date
Abstract

Key Words
Contact Info.

- importance
- good qualities
- common mistakes

- importance
- one paragraph
- summary
- write last
- common mistakes ...
omission of results
“Here we show ...”

Other Material

- acknowledgements
- references
- appendices
- online supplemental material



Uncomfortable Issues

- **scope of material**
- **journal vs. conference**
- **authorship** - who - order
- **permissions**
- **conflict of interest**
- **multiple submissions**
- **pre-submission critiques**



Review and Publication Process

- **manuscript submission**
- **review process**
- **outcome possibilities**
 1. **rejection**
 2. **revise**
 - **resubmit with cover letter**
 - **common mistake**
 3. **acceptance**
 - **final submission**
 - **galley proofs**

Further Information

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