Writing

Chaklam Silpasuwanchai

Asian Institute of Technology

chaklam@ait.asia

Overview

Introduction

The main **purpose** is to

- Argue your **motivation** and why did you do this work.
- The first impression, if it is badly written, reviewers will likely just skip the rest of the paper and gives you a rejection.
- This section usually contains **5 paragraphs** and **1 key figure** (same structure as abstract but in expanded version).

Introduction

- In the **first** paragraph, you should explain the **background** and current state of your area, as well as the core-related work.
- In the **second** paragraph, you should explain the specific **problem** and gap of past work. This is perhaps the most important paragraph and you should be very precise what is the problem you want to solve.
- In the **third** paragraph, you should explain **what you did**.
- In the **fourth** paragraph, you should explain the **surprising key findings**.
- The **last** paragraph, it is for explaining the **significance** and **impact** of this work, why we should care, and why it is important for the research community.

For new (especially non-native) students, DON'T DO OTHER FORMAT ASIDE FROM THIS. PLEASE FOLLOW THIS.

Common Mistakes

- 1st par: Write the background too generally. **Instead, you should**: Write the background in such a way that is VERY close to the problem.
- 2nd par: Pick overly broad question or problem. **Instead, you should**: Pick very specific question with clear IV and DV in mind. A good question should be built upon **limitations of past work.**
- 3rd par: Didn't provide any **rationale**. **Instead, you should**: The methodology you choose should be provided with reasonable rationale why you think this is a promising methodology, for example, why do you pick these IVs or DVs. Of course, becareful to going too detailed.
- 4rd par: Write all results. **Instead, you should**: Focus on **key interesting** findings. Interesting findings are usually one that are not obvious and surprising.
- 5th par: Does not know how to write impact. **Instead, you should**: This is easy, just copy what your role model papers write.

Related Work

The main **purpose** is to

- Reveal research **gap**
- Reveal potential **hypotheses**
- Reveal potential **IV** and **DV**

Any work that **does not meet these three purposes** are NOT related work.

Common Mistakes

- Educate readers, assuming they are beginners. **Instead, you should**: They are **experts**, so avoid explaining too much general knowledge. All experts already know what happen in the past, but what they want from you is insights, not give them a list of work. Explicitly guide them what is the research gap, potential hypotheses, or possible IV that no people has thought about in the past work, so they believe your work (future) is in the correct direction
- Didn't link each of your paragraph to the three purposes. **Instead, you should**: Each of your paragraph should link to your work.
- List and describe related work. **Instead, you should**: Synthesize your work to reveal gap, hypotheses, IV and DV.
- Choose **unrelated**, too **exploratory**, or too **old** work. **Instead, you should**: Choose related work that meet the three purposes; also choose related work with high citations or from renowned venues/universities. Try to choose related work with **clear hypotheses** and clear **IV** and **DV** - usually these are works that are solid. No clear hypotheses or too exploratory usually implies that the authors have little clue what they are doing.

Methodology

The main **purpose** is to describe:

- **Goal** - describes the goal of this experiment
- **Hypothesis** or research questions
- **Experimental Design** -within or between subject, IV and DV, control/confounding/random variables, counterbalanced method, number of blocks/trials, how long the entire experiment.
- **Participants** - how many participants, how many females and males, their mean age and SD, exclusion criteria if any, demographic information that may affect your study (e.g., in menu study, you would want to report how often did the participants use PC in their daily life), compensation for them (this is important to know whether participants have any motivational issue)
- **Apparatus** - what instrument you use, e.g., PC, questionnaires, game systems, etc. This part is related to confounding variable.
- **Procedure** - reviewers should be able to imagine clearly what did you exactly do during the experiment, and able to rerun your experiment.
- **Metrics** - describes what metrics you collect, and why you choose this metric

Common Mistakes

- Write in other format. **Instead, you should**: Don't deviate from this format. There is ONLY one way to write METHODOLOGY, at least in HCI papers.
- Your experimental design is bad. **Instead, you should**: Follow what we learn in class and then you will be ok!
- Did not carefully explain why you choose certain methodology over the others. **Instead, you should**: For example, justify why you choose to do the experiment in a lab based environment, instead of a field experiment, or why you develop custom app instead of a commercial app.
- **Too few** number of participants. **Instead, you should**: Perform a proper estimation from counterbalanced method, and also from reading papers. Usually at least 15 to 30 for controlled study. But if you plan to do exploratory work, you need at least 100.

Results

The main **purpose** is to

- Report your results in the boring way.
- There is ONLY one way to write, so there are not many mistakes. Just make sure to keep it boring because we are reporting **facts**.
- Follow the statistical test lecture **strictly** and you will be fine here.

Discussion

The main **purpose** is to

- Discuss some interesting perspectives related to your results. The hidden function is to show **how smart and how insightful** are the authors and whether you have thought deeply on the topic.

Possible discussion

- Did you find what you expect based on your **hypotheses**?
- How did your work **compare with related work**? Anything surprising?
- Why did you choose certain **experimental/device design decisions**, and how did it affect your results?
- Design **implications** or **guidelines**
- Discuss the **core limitations** that you think might affect the validity of your result. Limitation such as *I conduct this study in the US but I have not tested in the UK* is not a limitation to be discussed. Discuss CONCRETE, REAL limitation.
- **Future work** - How far are you from the **ultimate goal**?

Practical tips

- If this is your first time writing, please refrain from writing from scratch. It is really hard to write well because you don't know how too. **Choose one role model paper** that is closest to your work, and copy and learn from them. Learn basically everything, the style of writing, works they cited, how they design experiment. Learning from giants is the fastest way to become like them. Get your role model paper out, and read them 20 times.
- **One paragraph only one idea.** Each paragraph starts with an **opening** sentence ("This paper proposes. . .") and a signal (e.g., "However") describing the tone and whole idea of the paragraph. Each paragraph ends with an **ending** sentence concluding the main idea.
- Choose each word carefully, such that it has **no two meanings,** for example, *our technique is good* is a bad example because good can means so many things, speed, accuracy, etc. Remove ambiguity.
- Avoid **non-informative** sentence, e.g., *Our work is new* or *EEG is useful*.

Practical tips

- **Nice figures** - all good papers have nice-looking, self-explanatory, informative figures, especially in the **Introduction**. I cannot stress enough, but figures are super effective way to convey your ideas to readers
- Each sentence should ALWAYS BE BACKED by some **evidence**, i.e., DON'T MAKE any claims without evidence
- Ask yourself, what is your **contribution**? You SHOULD able to explain in one sentence. And this contribution should be coherent across abstract, introduction, your experiment, discussion, and conclusion. **Having a lot of contributions is usually bad** paper, as it has no focus or depth.
- Make clear what results are **surprising**, what are expected, do not mix them as it hides away why readers should care about your work. What surprising is usually that one that greatly advances the field. Too obvious result IS USUALLY not valuable.
- **Iteration** is the key. Keep in mind that real writing starts when you revise. The typical number for good paper is around 10 to 15 revisions.

Activities

Workshop

Read this paper. Identify writing mistakes and summarize them in a tabular format.

What's next

Read my slide on **Humans**, and these complimentary resources.

- Jeff, **Designing with the Mind in Mind: Simple Guide to Understanding User Interface Design Guidelines**, 2nd ed. (2014).
- Mackenzie, Chapter 2, **Human Factors**, Human Computer Interaction: An Empirical Research Perspective, 1st ed. (2013)

Also please download **PEBL** and make sure you have some simple **spreadsheet** programs for simple graphs generation.

Questions