How to WRITE GOOD PAPERS

2019.03.19
Juho Kim
Verba volant, scripta manent
(spoken words fly away, written words remain)
– Latin proverb
Sue Fussell
September 12 at 9:58 PM · 🇺🇸

CHI 2019 in a nutshell 🍎.apple

- Writing CHI papers: 45%
- Formatting CHI papers: 45%
- Arguing about formatting CHI papers in CHI Meta: 10%

5 Comments 1 Share
Assignment #2
Debrief
1. Why did you choose that paper?
What about the paper attracted you as a reader?

- Title
- Topic
- Message
- Authors
- Contributions
- Easy to read? Nice visuals?
Why is the paper you chose a good paper?
What makes good research?

✓ Research is creation and communication of knowledge that is:
  ○ Novel
  ○ Generalizable
  ○ Valuable
  ○ Valid

Definition from Krzysztof Gajos
What makes good research?

✘ Research is creation and communication of knowledge that is
  ○ Novel
  ○ Generalizable
  ○ Valuable
  ○ Valid

Definition from Krzysztof Gajos
3.

What are the major contributions of the paper you chose?
Contribution Types (in HCI)

✘ Artifact: building novel technology/system/algorith/m_interaction
✘ Empirical: understanding artifact & human behavior
✘ Methodology
✘ Theory
✘ Dataset
✘ Survey
✘ Opinion

Writing a Paper
Why does writing matter?

✘ Writing is communicating (newly found) knowledge and discussing its process, validity, scope, and implications.

✘ Your research is almost always shared with the world as written documents (= papers).

✘ Primary readers: fellow researchers who might like to build on this knowledge.
  ○ Treat it like designing API: think how others might use it.
Academic writing is highly formulaic

✘ You have to learn the rules.
  ○ Abstract => Intro => Related work => ...
  ○ Reporting stats
  ○ Area-specific norms and ways of explaining & convincing

✘ What do academics “speak in”?
  ○ Logical arguments, valid claims, references to previous knowledge, methodological rigor, novelty, (a very specific version of) English

✘ Analogous to writing code in many ways
  ○ Syntax/logical errors, debugging, code reviews, documentation, ...
Key Message: Approach it Reader-Centered

✗ Visualize readers & how they read your paper.
  ○ Time-pressed
    ■ Get to the message ASAP. Visualize & Summarize.
  ○ Not as excited as you are
    ■ Strong motivation, novel solution, promising results
  ○ Critical
    ■ Better be correct & rigorous
# How Video Production Affects Student Engagement: An Empirical Study of MOOC Videos

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## Finding

<table>
<thead>
<tr>
<th>Finding</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shorter videos are much more engaging.</td>
<td>Invest heavily in pre-production lesson planning to segment videos into chunks shorter than 6 minutes.</td>
</tr>
<tr>
<td>Videos that intersperse an instructor’s talking head with slides are more engaging than slides alone.</td>
<td>Invest in post-production editing to display the instructor’s head at opportune times in the video.</td>
</tr>
<tr>
<td>Videos produced with a more personal feel could be more engaging than high-fidelity studio recordings.</td>
<td>Try filming in an informal setting; it might not be necessary to invest in big-budget studio productions.</td>
</tr>
<tr>
<td>Khan-style tablet drawing tutorials are more engaging than PowerPoint slides or code screencasts.</td>
<td>Introduce motion and continuous visual flow into tutorials, along with extemporaneous speaking.</td>
</tr>
<tr>
<td>Even high quality pre-recorded classroom lectures are not as engaging when chopped up for a MOOC.</td>
<td>If instructors insist on recording classroom lectures, they should still plan with the MOOC formal in mind.</td>
</tr>
<tr>
<td>Videos where instructors speak fairly fast and with high enthusiasm are more engaging.</td>
<td>Coach instructors to bring out their enthusiasm and reassure that they do not need to purposely slow down.</td>
</tr>
<tr>
<td>Students engage differently with lecture and tutorial videos</td>
<td>For lectures, focus more on the first-watch experience; for tutorials, add support for rewatching and skimming.</td>
</tr>
</tbody>
</table>

Table 1. Summary of the main findings and video production recommendations that we present in this paper.
“Computer programs often have bugs. It is very important to eliminate these bugs [1,2]. Many researchers have tried [3,4,5,6]. It really is very important.”

“Consider this program, which has an interesting bug. <brief description>. We will show an automatic technique for identifying and removing such bugs”
Illustrating How Mechanical Assemblies Work

Niloy J. Mitra\textsuperscript{1,2}  Yong-Liang Yang\textsuperscript{1}  Dong-Ming Yan\textsuperscript{1,3}  Wilmot Li\textsuperscript{4}  Maneesh Agrawala\textsuperscript{5}

\textsuperscript{1} KAUST  \textsuperscript{2} IIT Delhi  \textsuperscript{3} Univ. of Hong Kong  \textsuperscript{4} Adobe Systems  \textsuperscript{5} Univ. of California, Berkeley

\textbf{Figure 1}: Given a geometric model of a mechanical assembly, we analyze it to infer how the individual parts move and interact with each other. The relations and motion parameters are encoded as a time-varying interaction graph. Once the driver is indicated by the user, we compute the motion of the assembly and use it to generate an annotated illustration to depict how the assembly works. We also produce a corresponding causal chain sequence to help the viewer better mentally animate the motion.
Anatomy of a Research Paper

- Title
- Abstract
- Introduction
- Background (or Related Work)
- Main idea / Methods
- Evaluation + Results
- Discussion
- Conclusion / Future Work

- 1000 readers
- 100 readers
- 100 readers
- 10 readers
- 7 readers
- 5 readers
- 3 readers
- 10 readers
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Before writing a paper, I ask my students...

- What will the contributions of this paper be?
  - What needs to be done to claim these contributions?
- Why would someone cite this work?
  - Write a hypothetical sentence some future researcher might use to reference your paper.
Remember IMRaD Model?
Canny Titles Are Good: But Avoid Being Cute

Should represent the contribution.

- System/artifact
  - “AODV-BR: Backup routing in ad hoc networks”
  - “Learning Without Peeking: Secure Multi-Party Computation Genetic Programming”

- Empirical
  - “Parallel Prototyping Leads to Better Design Results, More Divergence, and Increased Self-Efficacy”
  - “Anyone Can Become a Troll: Causes of Trolling Behavior in Online Discussions”

Abstract

X One recipe
  ○ General problem space / motivation (very brief)
  ○ Approach taken
  ○ Methodology + Key findings
  ○ Why the findings matter

X Often used as material for TPC bidding or session scheduling
Describe the work not the paper.

Present concrete results.
- “We present results from our evaluation” (X)
- “Our technique shows a 35% increase in performance over the baseline condition” (O)

Do not copy & paste sentences and phrases from Introduction & Conclusion.
- They serve different purposes & paraphrasing reduces ambiguity.
- Repeating can be seen as sloppy writing & bad style.
Many different recipes exist. But all roughly follow similar structure.

My favorite: the 5-point structure:
- State of the world …
- The big BUT…
- Therefore, we did …
- The key findings are …
- The contributions of this work are …
Activity
Let's watch a video & Discuss & answer these questions in Pairs

✘ State of the world …
✘ The big BUT…
✘ Therefore, we did …
✘ The key findings are …
✘ The contributions of this work are …
✘ Suggest a title

bit.ly/i2r-writing
ZENSAOS: Hybrid-Intelligence Sensing

INPUT
Every 2 minutes

A
“how many glasses need a refill?”

B

DISPATCHER

C
Crowd Annotation
“How many glasses need a refill?”

MACHINE LEARNING
Feature Selection
Supervised Learning
Boosting
Ensemble

D

4
3
4

E
refills = 4

“REFILL” ZENSOR

VISUALIZATION

If \text{refills} > 3
then \text{send text msg}

EVENT PROGRAMMING

END-USER INTERFACE

OUTPUT
Every 2 minutes

bit.ly/i2r-writing
ABSTRACT
The promise of “smart” homes, workplaces, schools, and other environments has long been championed. Unattractive, however, has been the cost to run wires and install sensors. More critically, raw sensor data tends not to align with the types of questions humans wish to ask, e.g., do I need to restock my pantry? Although techniques like computer vision can answer some of these questions, it requires significant effort to build and train appropriate classifiers. Even then, these systems are often brittle, with limited ability to handle new or unexpected situations, including being repositioned and environmental changes (e.g., lighting, furniture, seasons). We propose Zensors, a new sensing approach that fuses real-time human intelligence from online crowd workers with automatic approaches to provide robust, adaptive, and readily deployable intelligent sensors. With Zensors, users can go from question to live sensor feed in less than 60 seconds. Through our API, Zensors can enable a variety of rich end-user applications and moves us closer to the vision of responsive, intelligent environments.

We make the following contributions in this work:

- Zensors, a new approach and architecture for hybrid crowd-ML powered sensors, with an API to enable access to sensor data streams.
- A proof-of-concept mobile application for easy, end-user authoring of on-demand intelligent sensors.
- A tool for end-user programming of case-based events that turn sensor output into meaningful actions.
- A study that demonstrates the accuracy and reliability of Zensors in a variety of settings.
- Evidence that our human-powered sensors can be used to train computer vision approaches in situ, leading to an automatic handoff in most cases.
Common Misconceptions about Writing
“I’m not a native speaker so my writing’s going to be inevitably worse than a native English speaking colleague.”
I was once asked what were the most vital assets of a competent programmer.

... 

I said "exceptional mastery" of his native tongue because you have to think in terms of words and sentences using a language you are familiar with.

– Edsger W. Dijkstra

“An interview with Edsger W. Dijkstra”, By Thomas J. Misa
Communications of the ACM, August 2010, Vol. 53 No. 8, Pages 41–47
“I should start writing when my ‘research’ is complete.”
Idea \rightarrow Do research \rightarrow Write paper

“How to write a great research paper” by Simon Peyton Jones
Writing papers is a primary mechanism for doing research (not just for reporting it).
“Writing 10 pages is easy after working on the project for months. I will spend a few days before the deadline to write it up.”
TIME: crucial difference between bad and good papers

Multiple revisions are required. Ideally until feedback is mostly spelling and grammar issues

Intro often gets rewritten multiple times from scratch.

Beta paper: 2 weeks before the deadline
“I spent months implementing and debugging this module. I’m going to write four pages about it.”
✘ No, a paper is not a research diary.
✘ You spend 90% time implementing and debugging, but it might just be a paragraph in the paper.
✘ Focus on the “intellectual contribution”
✘ What’s the take-home message?
“I should not share my writing with others until it’s completely ready.”
Research is constant communication & interaction with your colleagues and the community.

http://suhailpatel.co.uk/el-castillo/#.W59aK5MzZTY
Tips on Language & Style

✘ Use a spell checker (or services like Grammarly) for any writing.
✘ Do not mix facts (results) with opinions (discussion).
✘ “We” is reserved to authors.
  ○ “We live in a connected world.” (X)
✘ Oxford commas (at least be consistent)
✘ Use active voice as much as possible.
✘ Do not use ref as nouns. E.g., “[3] shows that…” (X)
✘ Spell out numbers up to 10 + don’t start a sentence with a number.
✘ Commonly mistaken uncountable nouns
  ○ “feedbacks”, “researches”, “faculties”, “advices”, “softwares”, “stuffs”
Tips on Writing Habits

✘ Start writing 30 mins everyday.
✘ Write not just papers, but blogs, FB posts, Tweets, etc. Make videos.
✘ Care about the visual structure.
  ○ Sections, emphasis, charts, tables, figures
✘ Steal good patterns from your favorite papers (going back to Prof. Yoo’s meta reading skill).
✘ Plan & think before writing (replace with coding or making slides): outlines or notes help.
Audrey Girouard created a poll.

September 6 at 1:59 AM

With all the ongoing discussions about templates, I'm curious to know which format people are using.

- [ ] New ACM SIGCHI format - Overleaf
- [ ] New ACM SIGCHI format - LaTeX
- [ ] New ACM SIGCHI format - Word
- [ ] Previous CHI format - Word
- [ ] I've given up

3 More Options...

👍 Jofish Kaye and 6 others

9 Comments

https://www.facebook.com/groups/834637469921428/permalink/1949636351754862/
Assignment #3: Rewrite the abstract

✗ Rewrite the abstract of the paper from Assignment #2.
✗ Avoid limiting to only simple word changes.
✗ Analyze what “recipe” the original is following & think how it could be strengthened.
✗ Shoot for 150–200 words.
✗ Will discuss some examples in the writing workshop.
Resources

- “The Elements of Style” by Strunk & White
- “Writing for Computer Science” by Justin Zobel
- “How to write a great research paper” by Simon Peyton Jones
- ”Top-10 tips for writing a paper” by Jim Kurose
- “Tips for Writing Technical Papers” by Jennifer Widom
- “How do I write a good research paper?” by Andy Ko
- “Writing Technical Articles” by Henning Schulzrinne
Area-Specific Resources

X HCI
  ○ An HCI research paper writing guide formatted as an HCI paper by Jacob O. Wobbrock

X Software Engineering
  ○ “Draft Guidelines for My Students on Writing Software Engineering Research Papers” by Mark Harman

X Systems
  ○ “Tips about writing systems papers” by Lin Zhong