

# TRANSPARENCY IN RESEARCH

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## Abstract

Academic writing and research are often criticized for being too opaque. We analyze various forms of opaqueness and argue that transparency is the solution.

## 1. Introduction

Transparency is widely valued in our society. To ensure accountability, we require our governments be transparent. At home, we have transparent windows on our oven doors so that we can watch our food cook. We look upon murky water with suspicion, and demand clear, transparent water for drinking. Why, then, do we not also insist on transparency in research?

In this paper, we will consider several problematic forms of opaqueness in research and consider how transparency addresses the issue.

## 2. Complexity

Academic writing, especially in technical disciplines, is known to be particularly opaque due to its technical complexity. Often, when reading a particularly complex proof, the reader is left wishing they could see through all of the complex technicalities and grasp the key idea. Though transparencies can't help with the latter, they can definitely help you see through the proof.

## 3. Lexicographical

Computer science researchers are notorious for repurposing words, making their writing opaque to non-experts. Consider for example the term "bug", repurposed at Harvard in 1946 to denote a software or hardware design flaw. Such repurposing causes confusion, even amongst academics, as was witnessed by the need for an "insect track" at SIGBOVIK 2017.

Particularly problematic is the lexicographical reuse in Unix systems, due to researchers at Bell Labs and elsewhere. An uninitiated might think that "cat" and "shell" have something to do with animals; "kill", "kill file", and "daemon" with a Satanic cult; etc. And how many novices have reached for matches when told to "burn a CD"?

It is only by choosing clear, unambiguous terminology, i.e., transparent terminology, that academics can hope to be understood by the greater public.

## 4. Diagramming

Academics frequently provide diagrams ("pictures") to help their readers visualise their data or arguments. They do so at great personal risk to their hairline, as anybody who has produced a diagram using TikZ's, gnuplot's, or PSTricks arcane and opaque syntax can attest to.

J. McCann and N. Author (2015) presented a hand-held device for producing hardcopies. Though their work only considered the paper substrate, it is readily adaptable to transparencies. Using this adaptation, we found we could produce complex diagrams in a fraction of the time required to produce them in TikZ. Indeed, the author produced the diagram in Figure 1 in 253 seconds. The reviewers and you, gentle readers, are challenged to reproduce it using TikZ in under 253 minutes.

## 5. Duplication of effort

Academics are typically expected to give talks about their research. For those who have abjured chalk talks, this typically involves the

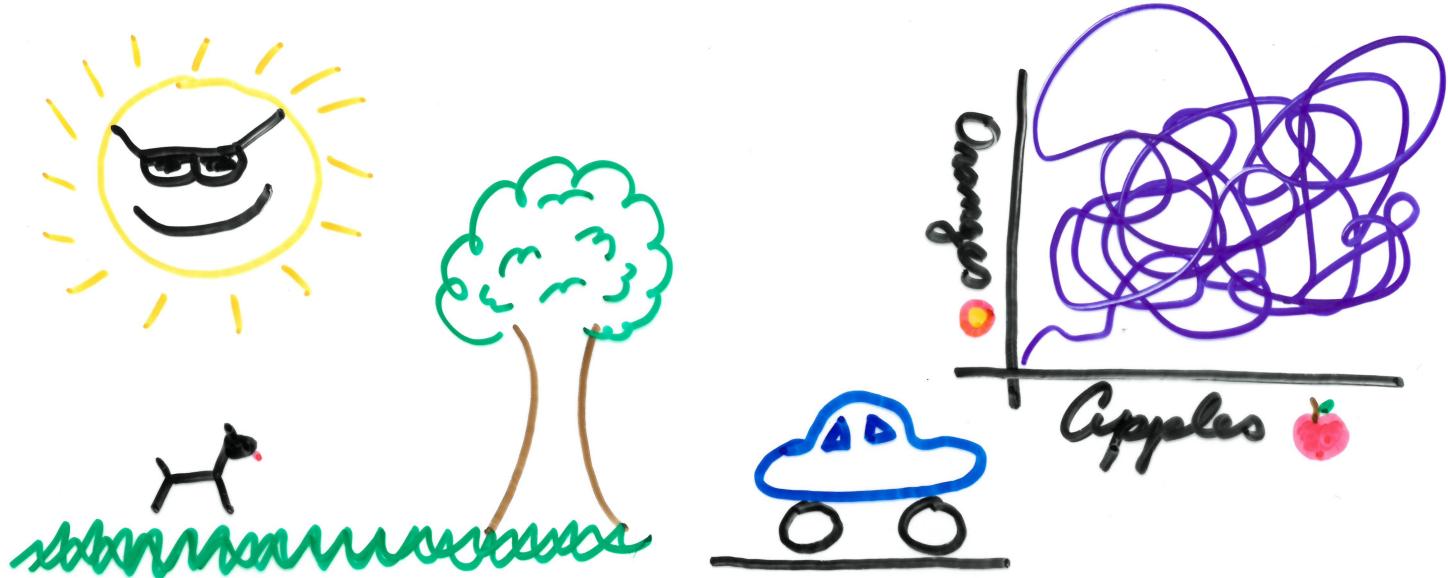


Fig. 1: A complex figure

lengthy task of slide making. For academics with children, this may involve a day outside with sheet metal, lumber, and tools. For others, it involves sitting at a computer and rearranging their article for overhead projection. This is a needless duplication of effort. Had they simply written their research on transparencies, they could have directly projected it with no additional effort.

## 6. Limitations

Though this research article is transparent in its original form, the copy in the proceedings is likely opaque. The author encourages the reader to contact the SIGBOVIK 2018 Proceedings Chair to request that future proceedings be printed on a transparent medium.

## 7. Conclusion

It is transparent that transparency and transparencies can transparently make research transparent.

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## References

- a. Gardner and K. Gardner, 'Blackberry Debugging', Proceedings of SIGBOVIK 2017. Pittsburgh, 2017, pp. 153-155.
- j. McCann and N. Author, 'A Hand-Held Device for User-in-the-loop Printing', Proceedings of SIGBOVIK 2015. Pittsburgh, 2015, pp. 13-15.
- R. Riley, 'Amazon Web Services', Proceedings of SIGBOVIK 2017. Pittsburgh, 2017, pp. 150-152.