The Best Paper Ever Written: A Practical Study of Goodhart's Law

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Abstract

One month ago, Simon Clark published a literature review titled "I read the top 100 scientific papers of all time" where he read and reported on the findings in the top 100 *most cited* papers of all time. I present here a novel technique for writing a highly-cited paper: cite yourself a lot.

1 Motivation

I want to be the very best, like no one ever was!

2 Prior work

The most cited paper ever [2] currently has about 305k citations [4]. For safety, I plan to beat that by at least a factor of 2.

3 Citing Myself 600,000 Times

600,000 papers, at one page per paper, would require about 3 metric tons of paper (about the same as 4 typical dairy cows) [5]. This is clearly impractical.

3.1 How many papers can we fit on a page?

Clearly we need to fit more than one paper on each page. How small can we go? The smallest (readable) fonts are around 4x6 pixels[1]; a very high quality printer prints at 4800 dots per linear inch. Therefore, in one square inch of paper, we should be able to fit a 1200x800 grid of characters, giving us a theoretical upper bound of 960000 chars/in^2. Assuming about 200 characters for a minimal paper, that lets us fit 448800 papers/page. At this resolution, we should be able to fit all 600,000 papers in a modest 1.5 pages. For formatting reasons, much of the papers are white space, so this is an upper limit.

4 Generating 600,000 unique papers

One way to get cited is to state a conjecture. Importantly for us, the only thing you need disprove a conjecture and publish a new paper is a counterexample.

Here I will propose a conjecture:

Conjecture 1 *There are no integers greater than 5.*

Now we need to generate a bitmap image of papers that refute this claim. A minimal paper has a title, author, year, body, and references. My papers will all follow this format.

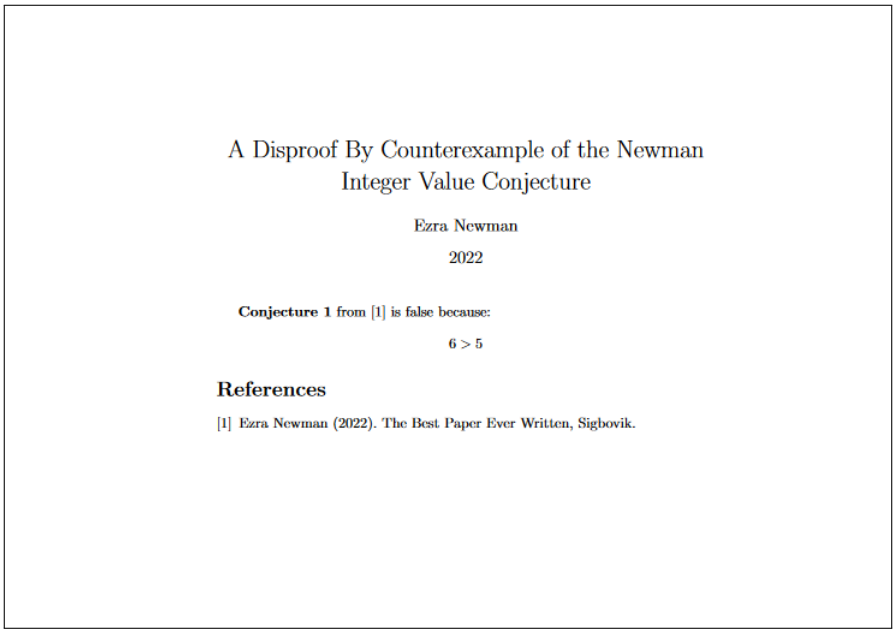

Figure 1: An example paper

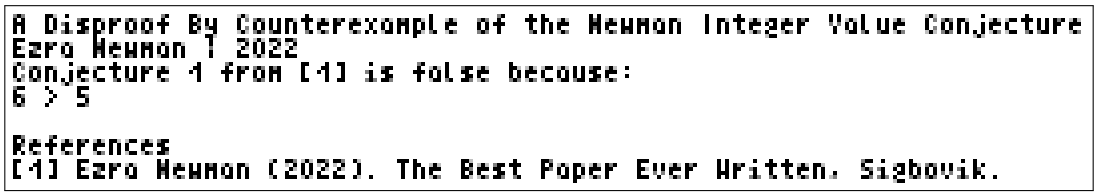

Figure 2: An example minimal paper, rendered in 268x42 resolution. Presented here scaled up by 10,000%

4.1 Paper layout

Rendering papers at 268x42px lets us fit one paper in just 0.0005in^2! That means we can fit nearly two thousand papers in an area the size of a postage stamp. With a 4px margin between papers, we can fit a 50x1,147 grid of papers on a standard 8.5" by 11" sheet of paper. This is about 2.5 times less than the theoretical limit, but we still clock in at only 4 pages.

I laid out my papers using a simple Python script included in the appendix.

4.2 Man, PDFs, am I right?

It turns out that the fine engineers at Adobe[3] who designed the PDF file format did not intend for it to display large images (around 3GP) at pixel-perfect resolutions. The only tools I could find that would deal with PDFs like this were Adobe Acrobat Reader and Imagemagick. Pillow's `image.save('results.pdf')`, LaTeX, Firefox, Edge, and Chrome all fail to render correctly (or occasionally, at all). Even Imagemagick and Acrobat struggle.

5 Conclusion

There we have it! This is the best paper ever written. Incidentally, this collection of papers also makes me the most prolific scientific author of all time (likely by several orders of magnitude). The practical value of these papers is dubious, but fortunately that doesn't matter.

References

[1] Adam Borowski. 1kb: tiny font, 2004.

[2] AL Farr RJ Randall OH Lowry, NJ Rosebrough. Protein measurement with the folin phenol reagent. *J biol Chem*, 193(1):265–275, 1951.

[3] paracelsus. Psd is not my favourite file format.

[4] Regina Nuzzo Richard Van Noorden, Brendan Maher. The top 100 papers. *Nature*, 514, 2014.

[5] Eric W. Weisstein. paper weight * 600000 — wolfram alpha. Visited on 2022-03-31.

6 Appendix

```
from math import floor
```

```
from tqdm import tqdm
from PIL import Image

font = Image.open('4x6.png')

example_paper_text = """A Disproof By Counterexample of the Newman Integer Value Conjecture
Ezra Newman | 2022
Conjecture 1 from [1] is false because:
6 > 5

References
[1] Ezra Newman (2022). The Best Paper Ever Written, Sigbovik."""


def render_paper(paper_text: str) -> Image:
        lines = paper_text.split("\n")

        max_line_len = sorted([len(x) for x in lines])[-1]

        img = Image.new('RGB', (max_line_len * 4, 6 * len(lines)), "white")
        pixels = img.load()  # Create the pixel map

        def render_line(line_no: int, text: str):
                for i in range(len(text)):
                        offset = ord(text[i])

                        x_start = offset * 4
                        x_end = x_start + 4

                        crop_rect = (x_start, 0, x_end, 6)
                        char = font.crop(crop_rect)
                        img.paste(char, (i * 4, line_no * 6))

        for i in range(len(lines)):
                render_line(i, lines[i])

        return img


if __name__ == "__main__":
        example = render_paper(example_paper_text)
        page_size = (int(8.5 * 4800), 11 * 4800)
        # page_size = (example.size[0] * 10, example.size[1] * 10)

        n = 6
        page_count = 0
```

```
        while n < 600_010:
                page = Image.new('1', page_size, "white")
                x_paper_count: int = floor(page.size[0] / (example.size[0] + 4))
                y_paper_count: int = floor(page.size[1] / (example.size[1] + 4))

                for x in tqdm(range(x_paper_count)):
                        for y in range(y_paper_count):
                                cur_paper_text = f"""A Disproof By Counterexample of the New
Ezra Newman | 2022
Conjecture 1 from [1] is false because:
{n} > 5

References
[1] Ezra Newman (2022). The Best Paper Ever Written, Sigbovik."""
                                n += 1
                                paper = render_paper(cur_paper_text)
                                page.paste(paper, ((example.size[0] + 4) * x, (example.size

                page.save(f'page{page_count}.png')
```