# ZINify: Transforming Research Papers into Engaging Zines with Large Language Models

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## ABSTRACT

Research papers are a vital building block for scientific discussion. While these papers follow effective structures for the relevant community, they are unable to cater to novice readers and express otherwise creative ideas in creative mediums. To this end, we propose ZINify, the first approach to automatically transform research papers into engaging zines using large language models (LLM) and text-to-image generators. Following zine's long history of supporting independent, creative expression, we propose a technique that can work with authors to build more engaging, marketable, and unconventional content that is based on their research. We believe our work will make research more engaging and accessible while helping papers stand out.

## KEYWORDS

Large Language Models, Text-to-Image Generation, Information Extraction, Generative Art, Zines, Summarization

## 1 INTRODUCTION

Academia has a long history of being viewed as a walled garden, with scientific jargon often limiting the audience that engages with research. More literally, academia is often paywalled and practically inaccessible to most people [8, 9]. In 2023, much of this seems to be changing. Open-access platforms like arXiV have become common venues to post papers and twitter communities have arguably become proxy conferences to discuss such work. The state of academia today includes not just primary researchers publishing papers, but also social media figures serving as research aggregators, educators summarizing complex concepts, and curious observers who engage out of interest. This disruption in research dissemination prompts us to explore innovative ways for greater openness and accessibility in the scientific realm.

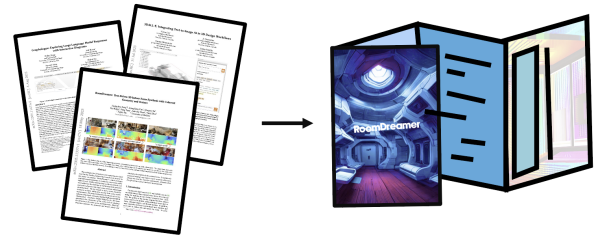---

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Figure 1: Academic papers are a critical medium to share insights within research communities. However, the demands of publishing have resulted in ideas that are not accessible to many non-expert groups, while also lacking the expressiveness of its individual authors. In our work ZINify, we propose converting dense research papers into informative and creative zines that can re-contextualise scientific developments and make research more engaging and accessible.

We consider the discussion of research work from two different user perspectives: the **reader**, who may not be a domain expert, and the **author**, who is interested in publicising their work in an accessible and creative way. In today's landscape, the reader faces multiple issues, the principal one being the steep learning curve involved in reading the latest research papers. Assuming abundant educational resources, comprehending these topics can still make research intimidating for many readers.

On the other hand, the author faces the challenge of making their research accessible to various groups while also marketing it effectively. The increasing use of arXiV, which has seen an exponential growth in AI-related papers for instance [5], indicates the difficulty in standing out today. As a result, several visual components such as videos, posters, and social media posts have become essential mediums to ensure sufficient readership of content. Similarly, the appearance of papers makes a big difference as shown in Huang [3], where they demonstrate that figure placements and size can play a critical role in the favourability of a paper.

In light of these issues, we propose ZINify, an automated pipeline to convert research papers into **zines**, a format traditionally associated with independent artistic expression (Fig 1). We draw on parallels between the punk-based origins of zine-making and the state of publishing in 2023 (Sec 2), to posit that these short, creatively reimagined versions of academic papers can serve as a promising medium for research discourse at all levels. This transformation
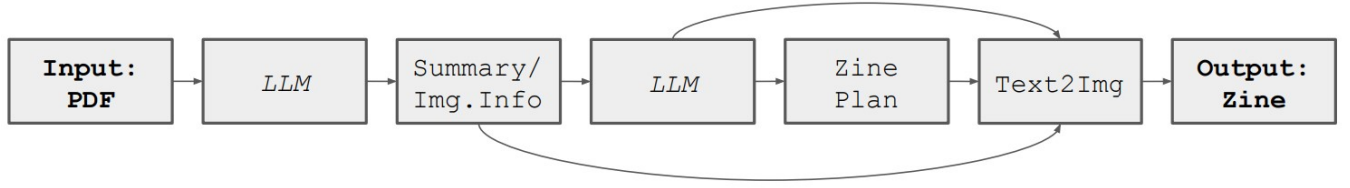
**Figure 2: We suggest a multi-step pipeline to transform research papers into captivating zines. Initially, a large language model condenses the paper into smaller sections. Next, it constructs a high-level plan for the zine and triggers a text-image generation model for visuals. Lastly, the pipeline assembles the visuals and generated content to create the zine.**

aims to make scientific content more digestible and visually engaging, further aligning with the contemporary trend of seeking unconventional mediums for knowledge dissemination.

## 2 BACKGROUND ON ZINES

Zines, a contraction of the word "magazines," have a rich history rooted in the late 18th and early 19th centuries, tracing a politically conscious culture that was vibrant and varied [10]. Particularly in the latter part of the 20th century, they were closely associated with movements like punk and queercore, underscoring zines' deep ties with social and political activism [2]. While academic discourse isn't always charged with the same social fervor, its essence—a melting pot of contrasting ideas and future visions—echoes the dynamic conversations that zines historically championed.

Zines are also self-published, typically produced in small print runs and self-distributed. This is not unlike the increasingly common pre-print culture in academia, where authors self-publish and promote their works before acceptance at a venue.

## 3 OBJECTIVE

ZINify's objective is to convert research papers into zines, summarize key findings and illustrate concepts in an aesthetically pleasing and creative manner. This initiative goes beyond mere summarization, as it seeks to preserve information while presenting it in an alternative and engaging format, which summaries to do not accomplish. The project leverages the capabilities of LLMs, such as

$$L_o = L_e + \int_\Omega L_i \cdot f \cdot cos\,\theta \cdot d\omega$$

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In realms of code where light does dance,
The rendering equation takes its chance,
Radiance, the light a point emits,
On surfaces, its radiant flux submits.

Irradiance, received with grace,
Upon a point's surface it does embrace,
A balance of rays, an intricate tie,
In this equation, light's secrets lie.
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**Figure 3: LLMs are capable of simplyfing complex concepts into simpler words, as shown in the above poem (bottom) which describes the popular rendering equation in computer graphics [4] (top).**

text re-interpretation, to achieve this goal. Further, by enabling human-in-the-loop co-creation, we can allow the user to guide the creation process and be a part of the ZINification process.

## 4 METHODOLOGY

**Initial Processing and Zine Planning.** The process starts with a research paper in PDF format as the primary input. Using Claude, Anthropic's LLM [1], essential text components are summarized and relevant figures are selected, guided by their corresponding descriptions. These elements can then be used by Claude to plan a coherent zine layout. Inputs from the user can also provide flexibility and control, aligning the process with the goals of the zine. For example, a complex equation might be translated into clever poems, thus enabling readers to grasp the concept more intuitively (Fig 3). These steps are driven by carefully created prompts that encourage creativity alongside faithfullness to the original material.

**Image Synthesis.** The zine planning step will also produce prompts to generate images for the zine, which are synthesized using a text-to-image model such as DeepFloyd IF [6], enabling complex concepts to be represented visually, further enriching the zine.

**Zine Compilation.** We plan to combine all generated elements into a single, multi-page PDF using one of many pre-determined layouts. If a generative pipeline for layouts becomes available, we intend to incorporate that as well.

## 5 DEMO

We aim to provide a public demo of ZINify at the conference, where attendees can upload a PDF of their choice and view the generated zine a few minutes later via our website. The expected result is a completed zine that presents the research content in a visually appealing format with bite-sized text that recalls essential details in an unconventional manner.

## 6 PRIOR WORK

Existing literature has explored various aspects of visualization and narrative communication. A notable study by McNutt [7] specifically examines the potential of zines as a medium for visualization, highlighting their accessibility and ability to convey complex data stories in a creative and engaging way. However, automatically converting research papers into zines is a novel and unexplored area at the intersection of visualization and scholarly communication.

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