Supplementary Materials for


1 Examples for poster and magazine layout generation

In specialized design tasks such as product card layout design and magazine layout design, Iris exhibits remarkable adaptability, adeptly handling a variety of scenario constraints and categorizing sections in mobile shopping applications or thematic classifications in magazine designs. Its capacity to fluidly align user-defined elements with scenario constraints is plainly discernible from Fig. S1, which illustrates its proficiency in integrating layouts with corresponding scenes.

**Input constraints**

1 Logo
2 Text
1 Underlay

**Midjourney**

**Iris**

![Fig. S1 Examples for PDCard and magazine graphic layout design by Iris](image)

2 Case study with Iris and Midjourney

In recent times, text-image models such as Midjourney\(^1\) and DALL-E2\(^2\) have garnered significant attention from designers and even general users due to their exceptional image generation capabilities. Besides generating captivating and imaginative images, these models have been recently explored by designers for creating poster layouts. To investigate the disparities between our system and Midjourney, while deliberating on potential future application directions, we conducted a poster layout design task using both systems, undertaking a comprehensive comparison in terms of input format, output results, user experience, and other relevant aspects.

In this task, we tried to create a poster based on provided product images, element categories, and quantities. The workflow for generating with Iris is similar to the one in the description provided in Section 5.2. When utilizing Midjourney, we first sought guidance from the community to learn effective strategies for crafting prompts. Then we carefully composed and inputted prompts into Midjourney, waiting approximately 3 min for the model to generate four images. However, the initial prompts failed to yield the desired poster layout. As a result, we iteratively refined and resubmitted prompts, eventually obtaining relatively satisfactory outcomes after six iterations. The details of the prompts used and the corresponding generated results throughout the iteration process can be found in the next section.

\(^1\)https://www.midjourney.com/
\(^2\)https://openai.com/dall-e-2
Fig. S2 Multi-constraint poster layout generation comparison

Fig. S2 presents the generated results from both systems. On analyzing these outcomes and the user experience when employing the systems, we posit that our system exhibits superior capabilities in layout generation, especially when users provide specific constraints. In contrast, Midjourney demonstrates enhanced performance in generating semantic content for design elements. Our system is characterized by three main advantages:

- **(1) Addressing of user needs**: As our implementation method directly incorporates user-specified design elements onto the background image, the background remains unaltered, and the design elements within the generated layout align with user expectations.

- **(2) Flexibility**: Our system permits users to modify the layout and insert custom design element content within the borders, including text and images.

- **(3) Usability**: Our system is highly usable for both professional designers and ordinary users, featuring a straightforward operation and the generation of 10 candidate layouts within seconds, thus allowing users to complete the poster design process in mere minutes.

However, our system exclusively supports layout generation and utilizes borders as proxies for design elements, thereby limiting content generation for these elements.

As for Midjourney, its ability to generate poster images at the pixel level enables the design and rendering of element content, such as crafting intricate decorations that harmonize with the background image’s style. Consequently, the posters it produces are aesthetically appealing and well-composed. Nevertheless, three primary drawbacks persist with regard to the completion of this task:

- **(1) Experience-dependency**: The quality of a poster generated using Midjourney is heavily reliant on user-input prompts, but the composing of prompts follows no specific rules, necessitating users to continually adjust and experiment based on their experience, which proves time-consuming for inexperienced designers.

- **(2) Uncontrollable nature**: Midjourney cannot manage the categories and quantities of design elements based on user input, and even significantly alter the input background image, which completely contravenes the task requirement of designing posters for particular products.

- **(3) Inflexibility**: The text generated within the posters is devoid of semantic meaning, being merely a collection of assembled letters, and all design elements, encompassing text and logos that necessitate customization based on particular contexts, remain uneditable.

### 3 Leveraging Midjourney for poster layout generation

Table S1 illustrates the iterative process of employing Midjourney for poster layout generation as explained in Section 7. It displays the prompts employed for each iteration, along with their corresponding generated results. As can be seen, the quality of posters generated by Midjourney is significantly affected by the input prompt. To achieve high-quality posters, highly complex and detailed prompts are necessary, which might not be approachable for designers lacking relevant experience.
Table S1: Prompts used and the corresponding generation results during the six iterations of layout generation using Midjourney

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Generated result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>![Generated result](<a href="https://s.mj.run/gkeSlvYfAyI">https://s.mj.run/gkeSlvYfAyI</a> add a logo onto and some Decorations on to the image without background change –iw 2 –v 5)*</td>
</tr>
<tr>
<td>![Generated result](<a href="https://s.mj.run/gkeSlvYfAyI">https://s.mj.run/gkeSlvYfAyI</a> add a logo onto and some Decorations on to the image without background change –iw 2 –v 5)*</td>
<td>![Generated result](<a href="https://s.mj.run/gkeSlvYfAyI">https://s.mj.run/gkeSlvYfAyI</a> ads, poster product of pink baby boy girls little girls romper dress, in the style of academic style, stylish costume design, imitated material, monumental ensembles, streamlined design, low details, flat clean design, realistic, add a logo and some decorations onto the poster background –ar 2:3 –iw 2 –v 5)</td>
</tr>
</tbody>
</table>

* “https://s.mj.run/gkeSlvYfAyI” in the prompt represents the link to the background image inputted to Midjourney, and this applies for all the following prompts
<table>
<thead>
<tr>
<th>Prompt</th>
<th>Generated result</th>
</tr>
</thead>
</table>

https://s.mj.run/gkeSlvYfAyI ads, poster product of pink baby girls little girls romper dress, in the style of academic style, stylish costume design, imitated material, monumental ensembles, streamlined design, low details, flat clean design, realistic, "ASDSDA text", text, word as logo on the poster background, add some texts to empty places of the image, some decorations like flowers onto the poster background –ar 2:3 –iw 2 –v 5

* "https://s.mj.run/gkeSlvYfAyI" in the prompt represents the link to the background image inputted to Midjourney, and this applies for all the following prompts
https://s.mj.run/gkeSlvYfAyI ads, cursed tarot card, flavor text mtg, newspaper, poster of pink baby girls little girls romper dress, "ASDSDA text", text, word as logo on the poster background, add some texts to empty places of the image, pink flower(Decoration) empty places –ar 2:3 –iw 2 –v 5

* "https://s.mj.run/gkeSlvYfAyI" in the prompt represents the link to the background image inputted to Midjourney, and this applies for all the following prompts
Prompt Generated result

https://s.mj.run/gkeSlvYfAyI ads poster product of pink baby girls little girls romper dress, in the style of academic style, stylish costume design, imitated material, monumental ensembles, streamlined design, low details, flat clean design, realistic, add some texts to empty places of the image, "ASDSDA text", ::Neon pink space "ASDSDA text", text, High Details, HDword as logo on the poster background, add some texts to empty places of the image, some decorations like flowers onto the poster background, cursed tarot card, ::poster, ::magazine style, ads, cursed tarot card, flavor text mtg –ar 2:3 –iw 2 –v 5

*“https://s.mj.run/gkeSlvYfAyI” in the prompt represents the link to the background image inputted to Midjourney, and this applies for all the following prompts*
https://s.mj.run/gkeSlvYfAyI ads, a leaflet, poster product about pink baby girls little girls romper dress, in the style of academic style, stylish costume design, imitated material, monumental ensembles, streamlined design, low details, flat clean design, realistic, add some texts to empty places of the image. "ASDSDA text", ::Neon pink space "ASDSDA text", text, High Details, HDword as logo on the poster background, add some texts to empty places of the image, some decorations like flowers onto the poster background, cursed tarot card, ::poster, ::magazine style, ads,cursed tarot card, flavor text mtg, commentary –ar 2:3 –iw 2 –v 5

* "https://s.mj.run/gkeSlvYfAyI" in the prompt represents the link to the background image inputted to Midjourney, and this applies for all the following prompts