ENVISIONING STORIES WITH GENERATIVE AI

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Open Teams Event, 9/18/2025

ABOUT ME

Research scientist exploring how to use Generative AI to support human creativity

Part of the Midjourney Storytelling Lab, developing and evaluating AI-augmented storytelling tools

ABOUT THIS TALK

Perspective of this work: Generative AI models as technologies, rather than specific products

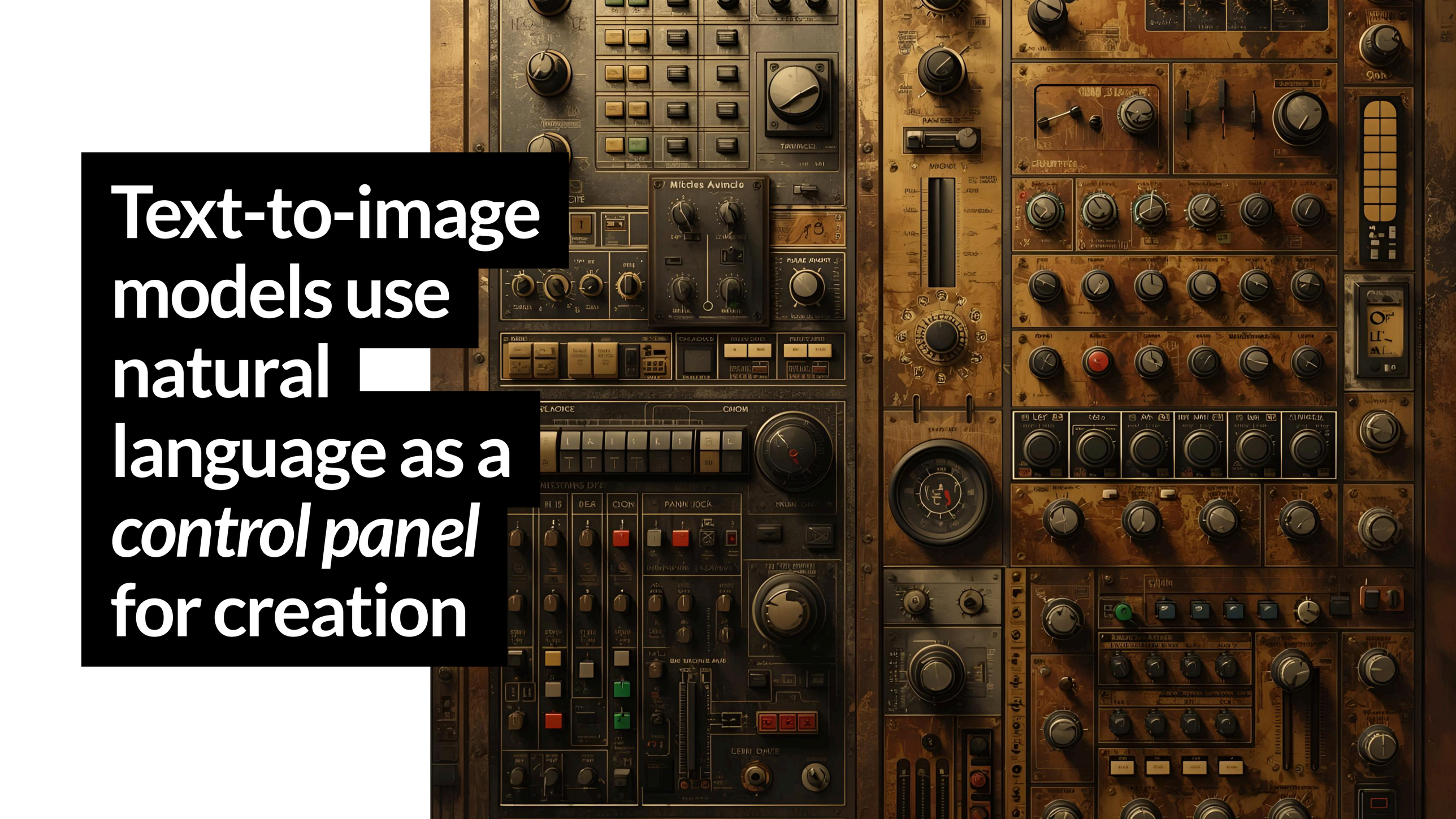
Out of scope: ethical concerns about Generative AI

TEXT-TO-IMAGE MODELS

PROMPT

"Serene beach at sunset with vibrant orange, pink, and purple sky. Calm waves, swaying palm tree in foreground, and silhouetted sailboat on horizon"

OUTPUT


Text-to-image models use natural language as a *control panel* for creation

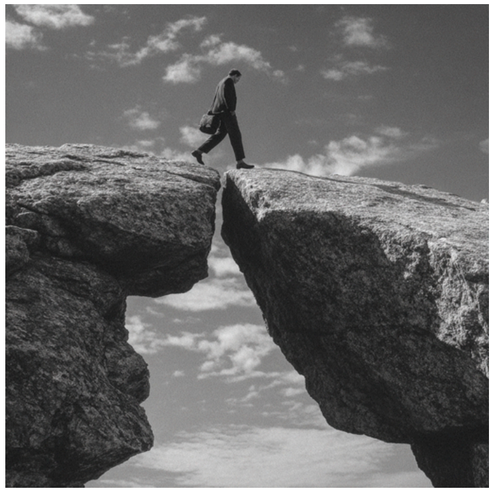
Text-to-image models are also a new way to explore language

★ by observing concrete interpretations of abstract or ambiguous text, for example

“The color blue is chasing after the number seven”

“angry lamp”

“coastal nails”



“The advantage outweighs the risk”

“The dolphin conducts professionalism”

“mathematical orchards”

STORY VISUALIZATION

- The task of transforming a story from text into visual form
- Can provide a new perspective on the story

RESEARCH CHALLENGES OF STORY VISUALIZATION

- **Text-image alignment:** how to ensure the images suitably depict the story text
- **Image-image alignment:** how to ensure consistency between images belonging to the same story
  - e.g. consistent portrayal of characters, settings, and objects

RESEARCH CHALLENGES OF STORY VISUALIZATION

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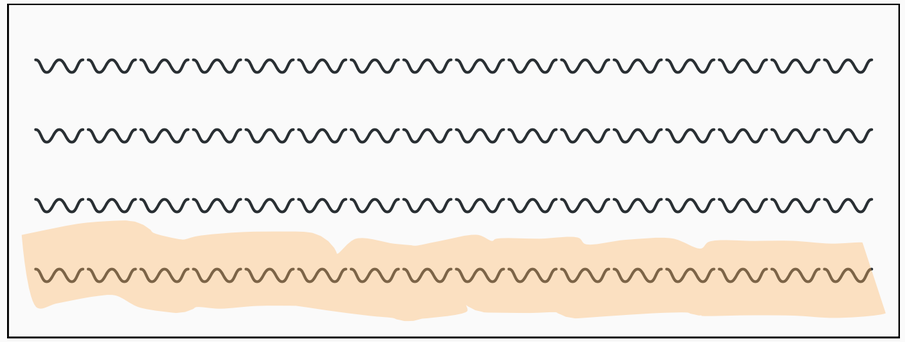
VISUAL E-READER

A speculative use case for story visualization

DESIGN

STORY WITH
SELECTED FRAGMENT

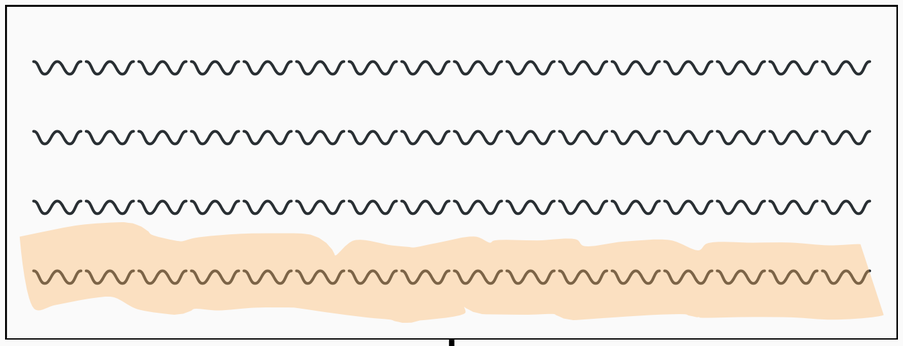


TEXT-TO-IMAGE
MODEL

IMAGE DEPICTING
SELECTED FRAGMENT

DESIGN

STORY WITH
SELECTED FRAGMENT



?

PROMPT

TEXT-TO-IMAGE
MODEL

IMAGE DEPICTING
SELECTED FRAGMENT

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

?

PROMPT

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

"Ellen ended up winning the prize."

Use fragment itself as prompt ("No-Context" Strategy)

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

"Ellen ended up winning the prize."

Use fragment itself as prompt ("No-Context" Strategy)

Obviously, image is missing important context

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

“Consider this story: [Ellen dreamed of winning a prize for her roses...] Based on this context, illustrate this fragment of the story: [Ellen ended up winning the prize.]”

Include the entire story before the fragment (“Verbose-Context” Strategy)

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“Consider this story: [Ellen dreamed of winning a prize for her roses...] Based on this context, illustrate this fragment of the story: [Ellen ended up winning the prize.]”

Include the entire story before the fragment (“Verbose-Context” Strategy)

Too much context gives result is similar to not enough context

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

"The woman who had carefully tended her special purple rose bush ended up winning the prize at the fair."

Use the fragment as the prompt, but edit it to summarize the context ("Succinct-Context" Strategy)

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

"The woman who had carefully tended her special purple rose bush ended up winning the prize at the fair."

Use the fragment as the prompt, but edit it to summarize the context ("Succinct-Context" Strategy)

Reflects story, but still does not depict what's happening in this particular fragment

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

"A beaming woman with gardening gloves stands proudly next to a vibrant purple rose bush in full bloom. She's holding a large blue ribbon that reads "First Prize" and a golden trophy. The scene is set at a county fair, with other flower displays and people visible in the background."

Describe the visual content of the *scene* evoked by the fragment ("Scene Description" Strategy)

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

Articulate visual details that are implied

"A beaming woman with gardening gloves stands proudly next to a vibrant purple rose bush in full bloom. She's holding a large blue ribbon that reads "First Prize" and a golden trophy. The scene is set at a county fair, with other flower displays and people visible in the background."

Describe the visual content of the *scene* evoked by the fragment ("Scene Description" Strategy)

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

Finally, we get a better illustration of the fragment

Articulate visual details that are implied

"A beaming woman with gardening gloves stands proudly next to a vibrant purple rose bush in full bloom. She's holding a large blue ribbon that reads "First Prize" and a golden trophy. The scene is set at a county fair, with other flower displays and people visible in the background."

Describe the visual content of the *scene* evoked by the fragment ("Scene Description" Strategy)

To use text-to-image models for story visualization, you need to describe the scene

- Annotators saw two alternative images for the same story fragment and were asked *“which is the better visualization of the fragment?”*
- Images generated from scene descriptions were significantly favored over images generated from other prompts that use the story text directly

Scene Description vs.	% of Pairs Where Scene Description Won
No-Context	78%
Verbose-Context	75%
Succinct-Context	73%

Published in *LLMs Behind the Scenes: Enabling Narrative Scene Illustration*. Melissa Roemmele, John Joon Young Chung, Taewook Kim, Yuqian Sun, Alex Calderwood, Max Kreminski. **EMNLP 2025**.

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Scene Description vs.	% of Pairs Where Scene Description Won
No-Context	78.1
Verbose-Context	74.7
Succinct-Context	72.5

★ Much knowledge useful for visualization is implicit, not explicitly stated in the story

Published in *LLMs Behind the Scenes: Enabling Narrative Scene Illustration*. Melissa Roemmele, John Joon Young Chung, Taewook Kim, Yuqian Sun, Alex Calderwood, Max Kreminski. **EMNLP 2025**.

Synthesizing scene descriptions

- Where do the scene descriptions come from? The author of a story can’t be expected to write them for every possible fragment

- Alternatively, large language models (LLMs) can act as a “visualization interface” for stories by automatically generating scene descriptions

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"A beaming woman with gardening gloves stands proudly next to a vibrant purple rose bush in full bloom. She's holding a large blue ribbon that reads "First Prize" and a golden trophy. The scene is set at a county fair, with other flower displays and people visible in the background."

SCENE DESCRIPTION

Ellen dreamed of winning a prize for her roses. She planned to enter her special purple rose at the fair. She fertilized the rose bush and covered it each night. The roses grew more beautiful every day. Ellen ended up winning the prize.

LLM

LLM INSTRUCTIONS

Imagine an AI system will be used to generate visualizations for story fragments...Your task is to read a story fragment along with its story context and write a scene description that specifies how to visualize the fragment...

"A beaming woman with gardening gloves stands proudly next to a vibrant purple rose bush in full bloom. She's holding a large blue ribbon that reads "First Prize" and a golden trophy. The scene is set at a county fair, with other flower displays and people visible in the background."

SCENE DESCRIPTION

VISUAL E-READER TUTORIAL

github.com/roemmele/Envisioning-Stories-with-Generative-AI/example.ipynb

```
with open("llm_prompt.txt", "r") as f:
    llm_prompt_template = f.read()
print(llm_prompt_template)
```

[27] ✓ 0.0s Python

```
You are operating inside a "visual e-reader" application that envisions highlighted passages of text as
images using an AI text-to-image generation model. Your task is to consider a highlighted passage
("fragment") inside of its story context, and then write a brief "scene description" (max 100 words) that
prompts the text-to-image model to visually depict the content of the fragment. The scene description
should focus specifically on what's mentioned in the fragment, using the provided context for
interpretation. Respond with the scene description only, without preamble.

Highlighted Passage: {fragment}
Context: {story}
Scene Description:
```

VISUAL E-READER TUTORIAL

github.com/roemmele/Envisioning-Stories-with-Generative-AI/example.ipynb

```
story = ("Lisa has a beautiful sapphire ring. "
"She always takes it off to wash her hands. "
"One afternoon, she noticed it was missing from her finger! "
"Lisa searched everywhere she had been that day. "
"She was elated when she found it on the bathroom floor!")
```

[2] ✓ 0.0s Python

```
llm_prompt = llm_prompt_template.format(
    story=story,
    fragment="Lisa has a beautiful sapphire ring.")
```

[11] ✓ 0.0s Python

VISUAL E-READER TUTORIAL

github.com/roemmele/Envisioning-Stories-with-Generative-AI/example.ipynb

```
import replicate, os

client = replicate.client.Client(api_token=os.environ["REPLICATE_API_KEY"])
scene_description = "".join(client.run(
    "meta/meta-llama-3.1-405b-instruct",
    input={"prompt": llm_prompt}))
print(scene_description)
```

[12] ✓ 2.6s Python

```
A close-up of Lisa's hand, with the beautiful sapphire ring prominently displayed on her finger, sparkling in the
light, set against a soft, neutral background to emphasize the ring's vibrant blue color.
```

VISUAL E-READER TUTORIAL

github.com/roemmele/Envisioning-Stories-with-Generative-AI/example.ipynb

```
from IPython.display import Image

url = client.run("black-forest-labs/flux-1.1-pro",
                 input={"prompt": scene_description,
                        "output_format": "png"})
Image(url, width=300)
```

[16] ✓ 4.3s Python

...

VISUAL E-READER TUTORIAL

github.com/roemmele/Envisioning-Stories-with-Generative-AI/example.ipynb

```
story = ("Lisa has a beautiful sapphire ring. "
"She always takes it off to wash her hands. "
"One afternoon, she noticed it was missing from her finger! "
"Lisa searched everywhere she had been that day. "
"She was elated when she found it on the bathroom floor!")
```

[ ] Python

```
llm_prompt = llm_prompt_template.format(
    story=story,
    fragment="She was elated when she found it on the bathroom floor!")
```

[18] ✓ 0.0s Python

VISUAL E-READER TUTORIAL

github.com/roemmele/Envisioning-Stories-with-Generative-AI/example.ipynb

```
scene_description = "".join(client.run(
    "meta/meta-llama-3.1-405b-instruct",
    input={"prompt": llm_prompt}))
print(scene_description)
```

[19] ✓ 6.0s Python

```
A young woman, overjoyed, bends down to pick up a sapphire ring from the white tile floor of a bathroom. Her hand
reaches out, and her fingers close around the ring as a relieved smile spreads across her face. Soft, natural light
enters through a nearby window, illuminating the scene. The bathroom's neutral colors and simple fixtures provide a
calm background for the woman's triumphant moment. Her eyes shine with happiness as she gazes at the recovered ring.
```

VISUAL E-READER TUTORIAL

github.com/roemmele/Envisioning-Stories-with-Generative-AI/example.ipynb

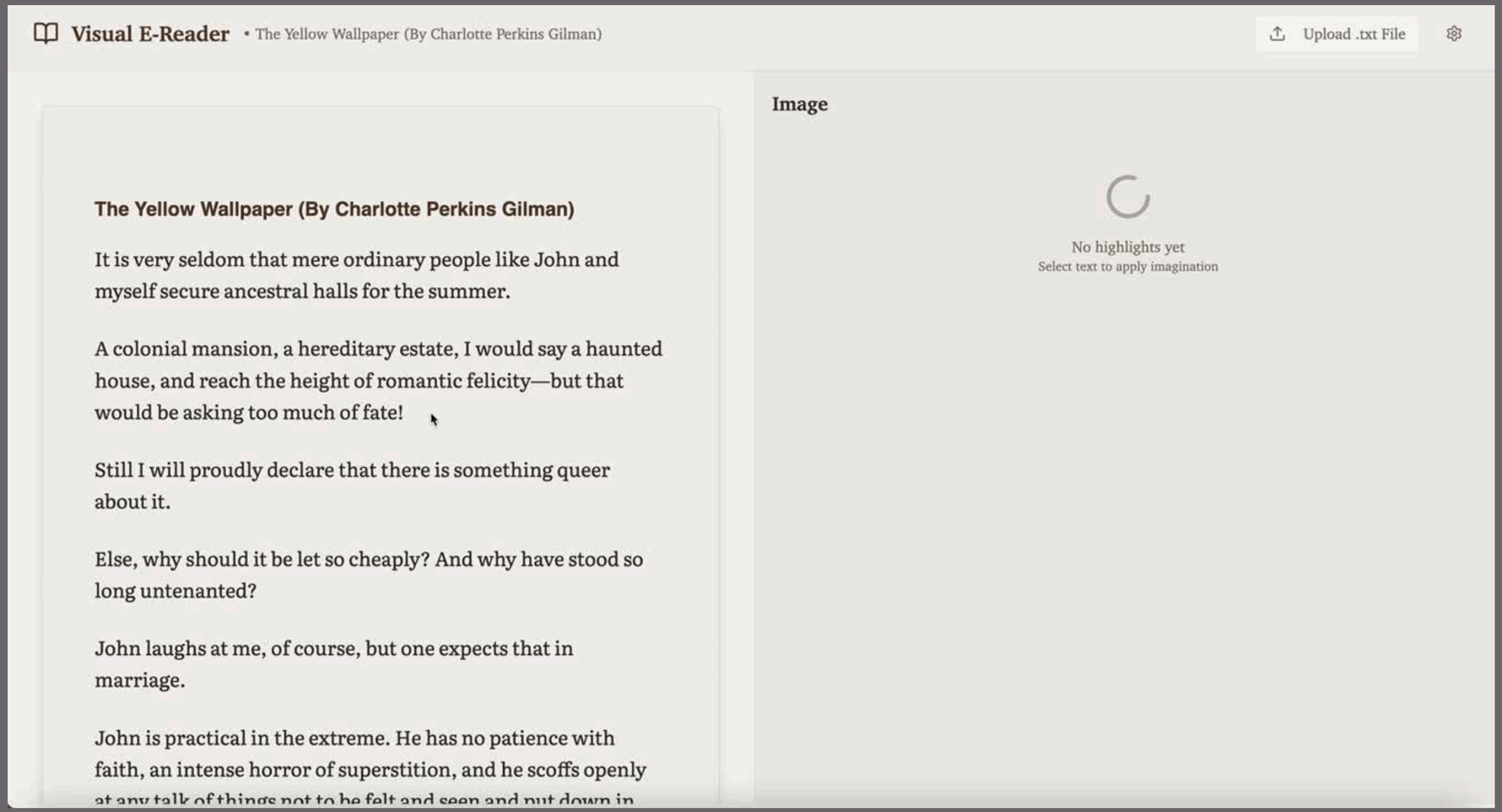
```
url = client.run("black-forest-labs/flux-1.1-pro",
                 input={"prompt": scene_description,
                        "output_format": "png"})
Image(url, width=300)
```

[25] ✓ 4.0s Python

...

VISUAL E-READER APP DEMO

github.com/roemmele/Envisioning-Stories-with-Generative-AI/visual-e-reader



TAKEAWAY

- Visualization can provide new opportunities to engage with text-based stories
- Text-to-image models are useful for on-the-fly visualization
- LLMs can support this by verbalizing visual scenes
- Emerging opportunities to expand story engagement to other modalities beyond images (e.g. video, audio)

THANK YOU!

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