



WHEN AI MET SCREENWRITING... CAN AI GENERATE BEAT SHEETS & STORYBOARDS?

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Abstract

Using Open AI's GPT-3 & DALL-E 2, we are able to generate beat sheets and storyboards within a matter of minutes. Through extensive prompt engineering, we find that GPT-3 possesses a strong understanding of Save the Cat! story structure and that DALL-E 2 can accurately capture a story beat's tone within an image. While this technology has come an incredibly long way in a short amount of time, it is unlikely that it will replace artists and writers anytime soon. Humans possess a level of creativity and originality that AI is still unable to match. Instead, these tools can be used to assist creators in streamlining the early steps of the development process.

01 Introduction & Save the Cat! Explained

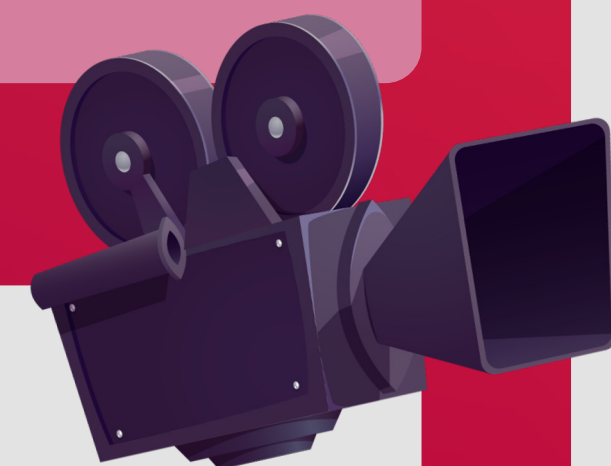
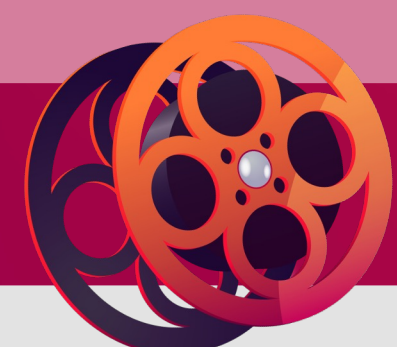
02 A Brief Overview of GPT-3 & DALL-E 2

03 A Writer's Approach to Prompt Engineering

04 AI-Generated Beat Sheets & Storyboards

05 Conclusions & the Future of AI in the Entertainment Industry

06 Ethics



Introduction

01 Can AI & Screenwriting Ever Just Be Friends?

After their first date...

Do you wonder how they ever existed without each other? Or do you ruin what each of them once had?

Background

Spoiler Warning! When you're watching a movie and think, "I've seen this before"... it's because you have. Nearly every movie and TV show follow the same basic story structure.

For our purposes, we will be working solely with Save the Cat!. However, the coming prompts can be reshaped to your preferred structure—from Aristotle to the Story Circle.

Save the Cat! 15 beat structure is as follows:

1. **Opening Image:** sets the story's tone
2. **Theme Stated:** what's it all about?
3. **Set-Up:** exposition
4. **Catalyst:** something big happens, sets the story in motion
5. **Debate:** will the protagonist *choose* to enter this new world?
6. **Break into Two:** leave old world, enter new one
7. **B Story:** secondary plot line introduced, often a love story
8. **Fun & Games:** promise of the premise, trailer moments
9. **Midpoint:** false victory or false defeat, A & B stories cross
10. **Bad Guys Close In:** stakes raise as bad guys push forward
11. **All is Lost:** lowest point in protagonist's journey, whiff of death
12. **Dark Night of the Soul:** why is all of this happening?
13. **Break into Three:** eureka! enter synthesis of the old & new world
14. **Finale:** reassemble the team & stop the bad guys
15. **Final Image:** mirror of opening image, how has the world changed?

GPT-3 & DALL-E 2

02 Open AI Explained (For the Humanities)

ChatGPT was prompted: "Explain GPT-3 & DALL-E in terms a liberal arts major could understand." The following is a loose transcription:

GPT-3 is a natural language processor trained on a large dataset of text (such as books, articles, and other written materials). With this knowledge, GPT-3 can then generate text by predicting the most likely words or phrases that should come next according to the patterns and structures of human language. First released in 2018, GPT has quickly gone from running off of a small number of parameters to 175 billion in the current GPT-3 model.

DALL-E 2 uses deep learning & a neural network (like a human brain) to generate images from text descriptions. It is trained on a large dataset of images and their corresponding text descriptions, learning to understand the relationship between the two.

Methodology

03 A Writer's Approach to Prompt Engineering

By refining a text prompt, we can instruct GPT-3 to generate a beat sheet based on inputted information. The following prompt was used:

Write a LEGNTHY & DETAILED ~500-word response in the style of a Save the Cat scene-by-scene Beat Sheet for a (GENRE) film using the Log Line, Setting, Comparable Films, Protagonist, Antagonist, and Scenes to Include provided below:

Log Line: After (A CATALYST), (A HERO) must overcome (OBSTACLE) to achieve (GOAL) or else (STAKES).

Setting: (FILLED IN BY USER)

Comparable Films: (FILLED IN BY USER)

Protagonist: (FILLED IN BY USER)

Antagonist: (FILLED IN BY USER)

Scenes to Include in the Beat Sheet: (FILLED IN BY USER)

FILL IN THE SAVE THE CAT BEAT SHEET TEMPLATE BELOW:

[Redacted List of the 15 Beats Found in Section 01]

Tips?

- o When prompting response **length**, use words with a **quantitative connotation** (such as "lengthy") and avoid using words that can be open to interpretation (such as "super"). While prompting a word count will not output that exact number, it will often be within the ± 100 word range.
- o Using the phrase **"in the style of"** suggests modeling the output after a certain type of beat sheet—similar to a particular author's voice (ex. in the style of Hemingway)
- o The more **tone & voice** used in the given information, the more **nuanced and unique** the output will be.

DALL-E 2 Integration

After generating our beats, we can use DALL-E 2 to visualize them. The following prompt was used:

"(ART STYLE) storyboard of (INSERT BEAT)"

Tips?

- o For consistency between image generations, include **character descriptions** such as age, last name, & hair color (ex. "14-year-old brunette Ricky Hernandez")
- o Including an **art style** steers the AI significantly (ex. realism, comic book, film still, etc.)
- o For even better results, input the art style of a **particular** TV show, movie, or piece of media (ex. "in the style of The Simpsons")



Results

[Link to AI-Generated Beat Sheets & Storyboards](#) →



04 Coming Soon to an AI Theater Near You...

The following were generated using a temperature of 0.7 and the text-davinci-002 model:

Case Study 01: TV Pilot

Input:

Write a SUPER detailed Save the Cat scene-by-scene beat sheet for a Sitcom TV pilot using the Log Line, Setting, Comparable Films, Protagonist, Antagonist, and Scenes to Include provided below:

Log Line: After getting hired as a lifeguard at his local waterpark, Ricky Hernandez must deal with the daily musings of an eccentric staff, wacky park-goers, and boogie boarders in order to not be fired from his summer job.

Setting: A Water Park at the Jersey Shore

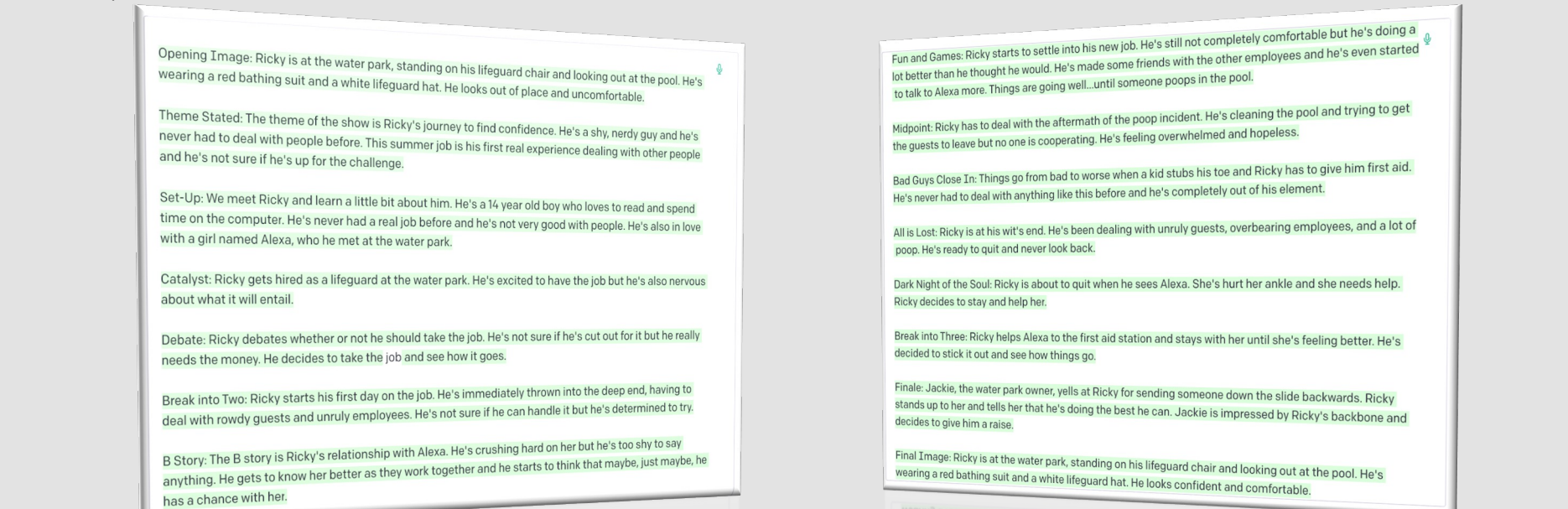
Comparable Films: The Office, Parks and Recreation

Protagonist: Ricky Hernandez. 14 year old boy. Nerdy. Easily burns up in the sun. Not the kind of guy to speak up when there's a problem and at this water park, there's A LOT of problems. Ricky also has a love interest. Alexa. Alexa is this cool boogie boarding girl that every employee has a crush on. Ricky doesn't think he has a chance with her but Alexa seems to have a thing for Ricky.

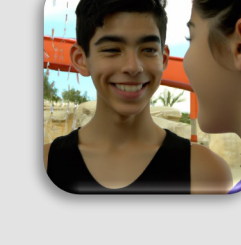
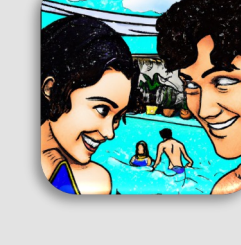
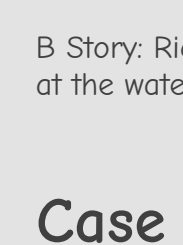
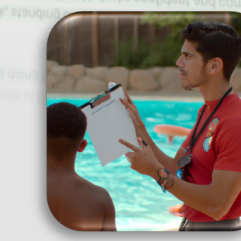
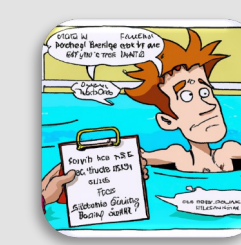
Antagonist: Jackie Munster. The water park owner. The water park is her pride and joy. Jackie makes sure that all of the rules are followed and the guests are satisfied. As a result, her employees, including Ricky, are overworked and tired.

Scenes to Include in the Beat Sheet: A scene where someone poops in the pool and they have to clear everyone out, a scene where Ricky has to give first aid to a kid with a stubbed toe, a scene where Ricky gets yelled at for sending someone down a slide backwards.

Output:



Catalyst: Ricky gets hired as a lifeguard at the water park. →



Case Study 02: Feature Film

Input:

Write a DETAILED ~500-word response in the style of a Save the Cat scene-by-scene Beat Sheet for a Romantic Comedy Film using the Log Line, Setting, Comparable Films, Protagonist, Antagonist, and Scenes to Include provided below:

Log Line: After breaking up with her boyfriend and finding out that their upcoming Hawaiian vacation is nonrefundable, Elle must spend a week with him in what should be paradise but turns out to be a personal hell as old sparks rekindle along the way.

Setting: Maui, Hawaii. Spring Break.

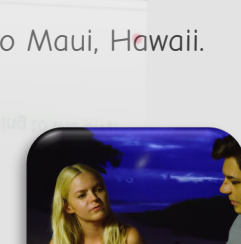
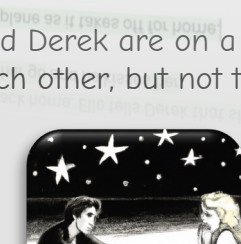
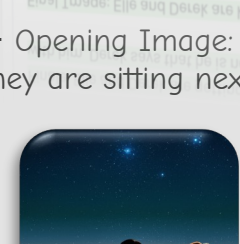
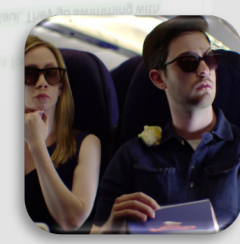
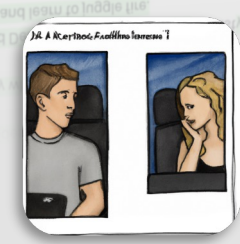
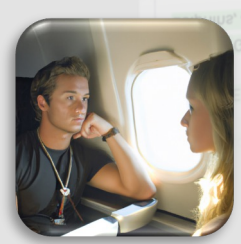
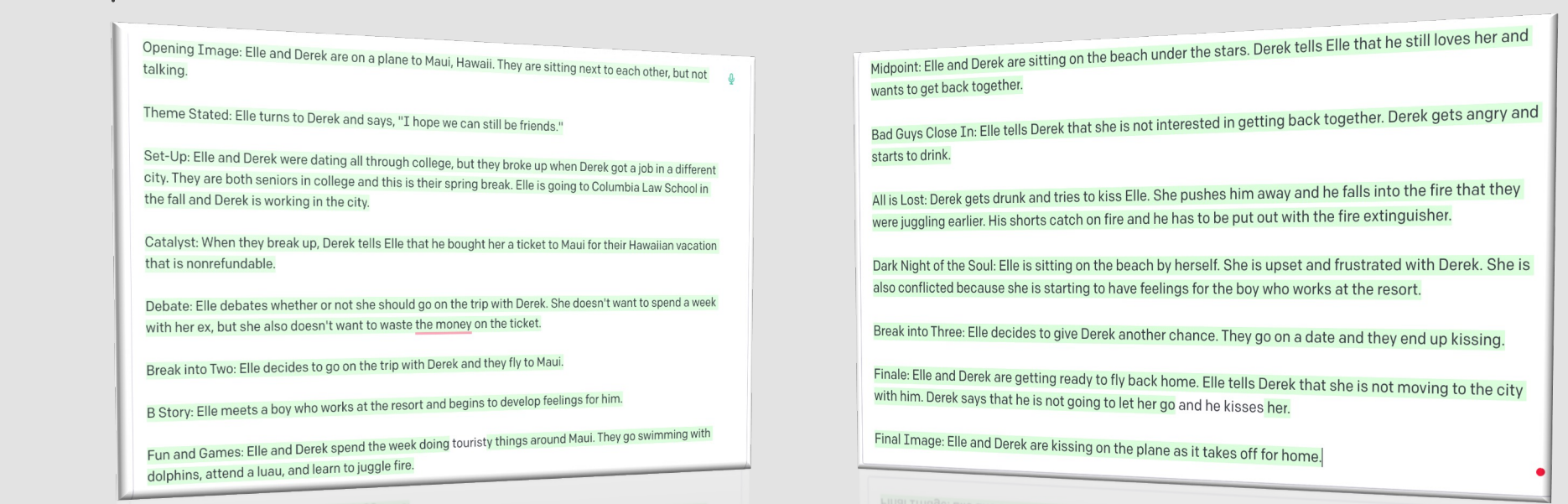
Comparable Films: The White Lotus, Forgetting Sarah Marshall

Protagonist: Elle Peterson. 22-year-old college student. Top of her class and has just been accepted into Columbia Law School. It's spring break and Elle's graduating in a just couple of months. Hawaii was supposed to be her last chance to finally have fun before graduation but her ex-boyfriend coming along on the trip too might make things a little more complicated. Elle also meets a boy who works at the Hawaiian resort and begins to develop feelings for him to

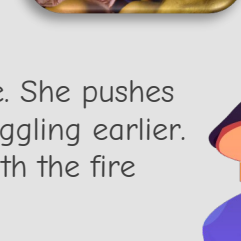
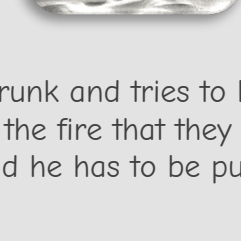
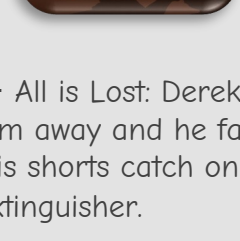
Antagonist: Derek Ryder. Elle's ex. Also a senior in college. Quirky guy that's kind of a dork but at the same time, he's the life of the party. After getting a job in a different city than where Elle would be, they decided breaking up would be for the best.

Scenes to Include in the Beat Sheet: A scene where they swim with dolphins, a scene where they attend a luau and Elle is forced to dance, a scene where they learn to juggle fire and Derek accidentally catches his shorts on fire, and a scene where they're sitting on the beach late at night underneath the stars.

Output:



Midpoint: Elle and Derek are sitting on the beach under the stars. Derek tells Elle that he still loves her and wants to get back together. →



← All is Lost: Derek gets drunk and tries to kiss Elle. She pushes him away and he falls into the fire that they were juggling earlier. His shorts catch on fire and he has to be put out with the fire extinguisher.

Conclusions

05 So, What Does All of This Mean?

Not only are GPT-3 & DALL-E 2 able to generate beat sheets and storyboards, but they are able to do so with a strong understanding of structure and tone. However, AI still has a long way to go.

What Worked?

In Case Study 01, the AI has an impressive understanding of the **voice** found in the given information—from the metaphor of being "thrown into the deep end" to the dramatic pause of "things are going well... until someone poops in the pool." Further, it has a complex grasp on **structure** that expands beyond the basics (as seen in the crossing of the A & B stories at the Dark Night of the Soul moment). The storyboards' **comic book style** and **vibrant color scheme** fit the tone of the beat sheet perfectly.

What Case Study 02 demonstrates best is the AI's ability to properly place the "Scenes to Be Included" into the most **appropriate beats**. "Sitting on the beach late at night underneath the stars" & Derek [telling] Elle that he still loves her" definitely belong at the Midpoint whereas Derek's shorts catching on fire is an apt All is Lost moment (nothing screams danger like fire!). The storyboards accurately reflect the **tone of each beat**—with the Midpoint stargazing scene even having a "magical" look to it.

What Didn't Work?

While both case studies did exhibit a Save the Cat! story structure, they still lacked a certain level of **comprehension** and **creativity**. Case Study 01 seems to miss the mark on the Midpoint and Case Study 02 lacks a **well-developed third act**.

Davinci-code-002 works best for generating beats that stick strictly to the **formula** (think a Hallmark movie) whereas davinci-code-003 takes more **creative risks**—often deviating from the prescribed structure as a result.

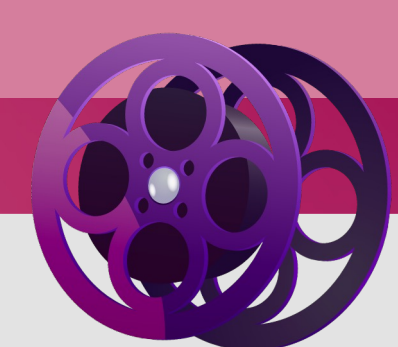
To counteract this "creativity issue", we can adjust the **temperature**. My testing has shown that anything ± 0.1 of 0.7 is best. Anything greater than ± 0.1 will output responses that are either too abstract or stripped down to nothing but structural formula.

What's Next?

GPT & DALL-E are still incredibly new. With the recent release of ChatGPT (November 2022)—which made significant advances to the AI's chat capabilities—and with GPT-4 on the way, the future of AI within the entertainment industry is looking bright...

It is only a matter of time before natural language processors will be modeled after a particular screenwriter's voice... provide instant coverage on a script within minutes (sorry interns!)... and create pitch decks at a moment's notice.

And this is only the beginning.



Ethics

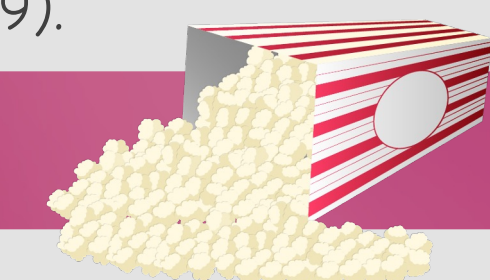
06 Wait! What Does This Mean for Us Artists & Writers?

ChatGPT was prompted: "Will AI replace artists and writers?" The response:

"It is **unlikely** that AI will completely replace writers and artists. While AI can be trained to perform certain tasks, it is not capable of the same level of creativity and originality that humans possess. Additionally, the creation of art and literature is deeply rooted in human experience and emotion, which are difficult for AI to replicate. Therefore, it is more likely that AI will augment the work of writers and artists, rather than replace them entirely."

So, unless the AI is just trying to cover its tracks, it sounds like creators are safe. For now. In the meantime, AI can still assist us in the creative process:

Dramatron (December 2022), based in GPT-3, allows writers to input a logline and then let AI generate the rest—script included. When interviewing beta participants, they found that Dramatron is incredibly useful in producing "a rough draft" (Mirowski et al. 9). It knocks out that nasty step of actually getting something down on the page. Further, Dramatron is "perfect for writers' block," coming up with new ideas on a dime (9). This technology could be most useful in the TV world where "writing formulaic scripts" is key—the AI even acting as the world's best "dramaturge" (9).



Acknowledgments

For further studies, reference the works below:

Elkins, Katherine. *The Shapes of Stories*. Cambridge University Press, 2022.

Mirowski, Piotr, et al. "Co-Writing Screenplays and Theatre Scripts with Language Models An Evaluation by Industry Professionals." *ArXiv*, 30 Sept. 2022.

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