Spencer Van Horne, Richard Rodriguez   Team: Automation Learners

Introduction to Generative Adversarial Networks (GANs)

Our team wrote two short stories each, one true and one false as an exercise to better understand Generative Adversarial Networks. We then read them and decided which was true and which was false. Generative Adversarial Networks (GANs) represent a remarkable artificial intelligence method capable of producing new data that looks authentic. Envision two AI systems where one functions as an artist and the other operates as a critic. The artist generates realistic images for the critic to evaluate. The artist strives to produce images that are indistinguishable from real ones to the critic. The ongoing interaction between these two systems results in both improving over time which enables the production of realistic images and sounds as well as text.

Methodology: Story Creation and Analysis

Story Creation: Teams started by having each member write two short narratives including one factual account and one fabricated story. By drawing from their creativity and real-life experiences participants constructed these stories. The true story reflected a real occurrence and the false story was completely made up but crafted to appear realistic. Participants had to maintain both authentic elements and imaginative aspects to make the false narrative convincingly resemble the format and details of an actual event.

Analysis: During the second step each team member read their peer's stories to each other in turns. Participants focused on analyzing each narrative to establish which one was authentic and which one was fabricated. During the analysis phase participants used critical thinking skills and meticulous attention to detail to assess how plausible,

consistent, and realistic each narrative appeared. Team members engaged in a discussion which enabled them to exchange their thoughts and understandings while learning about the effects of subtle cues and storytelling methods on perception.

Spencer Story #1

One evening, as I was walking home from work, I heard faint meowing coming from an alleyway. Curious, I followed the sound and found a small, scruffy-looking cat huddled behind a trash bin. It was shivering, its fur matted from the rain earlier that day. I hesitated at first—I wasn't sure if it was friendly or if it even belonged to someone. But as soon as I crouched down, the cat cautiously stepped forward and rubbed its head against my hand. It was too late. I was already attached.

I decided to take the cat home for the night, giving it some leftover chicken and a warm place to sleep. The next day, I posted about it online and checked for lost pet notices, but no one came forward. A week passed, then two. By then, the cat—who I had named Mochi—had made herself at home, curling up on my lap every evening. I hadn't planned on getting a pet, but somehow, Mochi had chosen me.

Spencer Story #2

A few months ago, I was at a bookstore browsing through the shelves when I noticed a man standing at the end of the aisle, flipping through a book. I didn't think much of it until later that evening when I went to grab coffee at a nearby café—he was there too, sitting by the window, reading the same book. I brushed it off as coincidence, but something about it made me uneasy.

The next day, I was riding the subway when I glanced up from my phone and saw him again, standing a few feet away, holding the same book. My heart started to race. It didn't make sense. I had never seen this person before yesterday, and now he was everywhere. Gathering my courage, I walked up to him and asked, "Hey, sorry, but... have we met before?" He looked at me, slightly puzzled, then smiled. "Not yet," he said, closing the book and stepping off at the next stop. I never saw him again.

Richard Story #1

In the summer of 2000, shortly after graduating from high school, I was actively working as a lifeguard at the neighborhood pool. This would be one of the last summers I would work as a lifeguard and was filled with work in the mornings as a swim team coach, lifeguarding during the day, and evenings gathering with close friends as we all prepared to go off to college or join the military. It would also be the last time we all gathered this way as friends slowly stopped coming back to town and moved on with life.

To make lasting memories we all decided that we would dive into painting at a friend's place we all called the clubhouse. It was the neighborhood soccer league venue as well and no major activities were going on during the heat of Houston summers. We would gather and make large scale paintings in many styles from drip painting on small canvases to giant group drip paintings on 20-foot-long by 5-foot-wide pieces of siding that we mounted in various sections of the clubhouse. I still have photos of the painting gatherings and have continued painting enjoying oil painting Bob Ross style landscapes.

Richard Story # 2

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While out hunting with my father we were put in a rather dangerous situation involving a group of young bucks that had surrounded our deer feeder. We had inadvertently placed the deer feeder on our neighbor's piece of land instead of our own. This was a slightly undeveloped section of the woods with no clear boundaries in place and thus our mistake was merely an oversight on my father's part. We had already loaded the deer feeder and had set up in our deer blind roughly 25 yards away in a grove of trees. This was where our mistake led to a confrontation with a group of armed neighbors who wanted to force us off their property. The neighbor had trail cams posted in various parts of his property and had seen the deer begin to gather and was surprised to see a deer feeder where no deer feeder had been just a few hours earlier. The neighbor and a few of his friends all came to investigate the "poachers" on their property and were ready for a fight. While it was a scary situation my father explained and deescalated the situation as best he could but we were unable to shoot any deer that trip and came back empty handed.

Analysis & Discussion

The story creation and analysis activity revealed important information about what makes narratives believable. Our activity led to the identification of multiple crucial elements which determined the perceived truthfulness of a story.

Notable Findings on Story Believability:

Realism and Relatability: Narratives based on common experiences and familiar situations emerged as more credible. The realistic setting and relatable emotional journey made Spencer's story about finding and adopting a stray cat (Story #1) appear plausible to

readers. The story where a mysterious stranger appears multiple times (Story #2) seemed more like a fictional narrative element than a true account.

Specificity and Detail: Stories became more believable with detailed descriptions and sensory elements. The account of Richard's summer lifeguard duties together with his painting sessions with friends (Story #1) delivered specific information about the environment and both activities and feelings. Such precise details enabled the creation of a narrative that felt both plausible and engaging.

Plausibility of Events: The believability of the stories depended heavily on how probable the events described appeared to readers. Readers tended to accept stories about everyday events as authentic more readily than those about extraordinary occurrences. Richard's hunting story (Story #2) appeared less believable because its dramatic confrontation with armed neighbors was an unusual and unlikely scenario.

Elements that Affected Believability:

Consistency: The believability of the stories depended on their narrative consistency which maintained a logical progression and coherent timeline. Plot inconsistencies or sudden narrative changes may cause readers to question the story's genuine nature.

Emotional Resonance: Narratives that triggered authentic emotions or paralleled the reader's personal experiences gained greater acceptance as believable stories. The emotional bonds created through feelings of empathy towards a stray cat or nostalgic memories of summer social gatherings strengthened the truthfulness of the narratives.

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Character Behavior: The believability of stories was affected by how characters behaved and reacted throughout the narratives. The authenticity of the story emerged from realistic actions like Richard's father's calm de-escalation during the hunting episode which readers found relatable. When characters display exaggerated or improbable actions the story loses its sense of believability.

Overall Observations: The exercise showed how important it is to create stories that reflect real life while providing detailed content and emotional depth. Our examination of the elements that enhance story believability allowed us to grasp how various subtle indicators and narrative methods shape audience perception. The insights we gained about creating believable stories can help us understand how Generative Adversarial Networks (GANs) produce data that looks authentic.

Relating to GAN's

Distinguishing real from fictional stories is similar to how a Discriminator in a Generative Adversarial Network (GAN) works. In GANs, the Discriminator analyzes data, like images or text, to determine if it is real or generated. Likewise, when reading stories, people look for clues to figure out if they are true or made up. Both rely on patterns to make their judgments.

The Generator in a GAN tries to create realistic content that can fool the Discriminator, just like a writer crafting a fictional story that seems believable. Over time, as the Generator improves, it becomes harder for the Discriminator to tell the difference. This mirrors how well-written fictional stories can be difficult to separate from real ones.

This challenge extends beyond storytelling. As AI improves, tools like GANs can generate highly convincing but false information, making it harder to tell what's real. This raises concerns about deepfakes and misinformation, highlighting the need for better ways to detect AI-generated content.

Conclusion:

The exercise of developing and evaluating stories shed light on how Generative Adversarial Networks (GANs) operate and function. The activity enabled us to explore how narrative generation and authenticity assessment function together similarly to GANs' generator and discriminator roles.

Key Takeaways:

Understanding GANs: The exercise demonstrated the GAN framework by showing how generators produce realistic data (stories) while discriminators assess their authenticity. This ongoing dynamic process results in continuous enhancement comparable to how adversarial training enables GANs to create progressively more realistic outputs.

Elements of Believability: Our study revealed essential elements that determine narrative believability including realism, specificity, plausibility, consistency, emotional resonance, and character behavior. The features that GANs need to capture to create convincing data closely resemble these narrative elements.

Critical Analysis: This activity demonstrated how critical analysis and attention to detail play essential roles in separating authentic stories from fabricated ones. The discriminator

role in GANs requires advanced evaluation mechanisms to identify fine distinctions

between real and synthetic data.

Reflections on Relevance: This exercise offered a practical and interactive method to

understand the fundamental principles of GANs. Our story creation and analysis process

enhanced our understanding of the intricate challenges encountered in producing and

assessing authentic data. The comparison between our activity and GANs highlighted how

both human thought processes and artificial intelligence systems develop through

repeated cycles of learning and enhancement.