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Towards "Creativity Amplification" or, AI for Writers, or Beating the System

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Abstract

In his 1993 paper delivered at NASA's Vision-21 conference, science fiction writer and computer scientist Vernor Vinge asked: "We already have programs that can play [chess] much better than humans. But how much work has been done on how this power could be used by a human to get to something better?" This article is an attempt to undertake some of that work, by recording and reflecting on some of the experiments I undertook while endeavouring to treat AI not as the enemy, but as IA—Intelligence Amplification—and how this approach affected my writing practice, developing into what might be called Creativity Amplification. Rather than being an exhaustive exploration of the technologies cited (GPT-2, chatbots and Charisma AI) and the processes developed while using them, this article is intended as an invitation to explore and play with them, and a call to practice IA thinking in relation to all technologies, old and new.

Keywords: AI, Writing Technology, Creative Thinking, Interactive Practice

Better Than You

In 1993, Vernor Vinge predicted: "Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended" (11). Vinge coined the term "the Singularity" to define this event when AIs "'wake up'", surpassing their human creators and becoming self-aware (12). That this advance could lead to "true technological unemployment" (14) is the aspect of Vinge's argument which seems to have caught the most attention and continues to be a point of fixation for media outlets (CF Mahdawi 2017). It is perhaps unsurprising, then, that fears of impending obsolescence brought about by new technologies has made its way into writers' work. As Martin Paul Eve observes, a Stephen King short story "in which the 'delete' function of his computer allows him to erase reality" offers "a clear metaphor for a fear of redundancy in the face of the machine's power" (2017: 39), while Roald Dahl's 1953 short story 'The Great Automatic Grammatizator' more closely resembles a generative system via "a machine that quantifies human creativity through the mathematicisation of language" which relegates writers to the role of operators (39). Neither Dahl nor King were writing about AI specifically, but as Eve later comments, it is not so much particular technologies or their usage that Dahl, King and Eve himself find so "alarming" but rather "the decentring of the human in the production of written language" (47). Even Vinge implies that the "post-human era" is something to be "survive[d]" (1993: 11).

However, Vinge also stresses that alongside AI developments, humanity would make progress in terms of IA or "Intelligence Amplification" (1993: 16). This is the notion that when "our ability to access information and […] to communicate it to others is improved, in some sense we have achieved an increase in our natural intelligence." (17) Rather than fearing AI, we should, Vinge suggests, embrace it: "We already have programs that can play

[chess] much better than humans. But how much work has been done on how this power could be used by a human to get to something better?" Obviously, the theme of this volume shows that increasingly, that work *is* being done. This article is my contribution to that growing body of work. It considers how to use AIs as writing partners, how to turn creative writing into data that might be analysed by AI and what insight such analysis might reveal to us as writers. It achieves this through exploring some of the experiments I undertook in these areas and reflecting on how they affected my writing practice. Ultimately, this article is my attempt to treat AI not only as IA, but also as CA: Creativity Amplification. It is a call to view technological advances in general as an opportunity for CA.

Speaking at the 2019 AI-themed creative research and business innovation conference, Beyond, Parry Malm, CEO of Phrasee (an AI-powered copywriting company), opened with the purposefully provocative statement: "Phrasee is AI that writes better than you, and you, and definitely you" (2019: 1:03). A writer amongst tech geniuses and start-up entrepreneurs, my instant gut reaction was: "It may be better than them, but it isn't better than *me*". A somewhat arrogant assumption, perhaps, and yet Malm's demonstration only went on to solidify that belief. Sharing a list of lines of advertising copy, Malm encouraged us to vote for the most appealing one, and then showed us which one had actually appealed most to customers. This was the line the AI had written, and not the line the majority of the audience had picked. Malm presented this as proof of the AI's efficiency and democratisation of the process of writing marketing copy. I drew two additional conclusions: 1) the AI, while impressive, only really excels at a very specific type of writing (a single line of marketing copy) and 2) it is only better than people with no particular expertise in writing. However, Malm's other central point: that to deny and fear these technologies rather than embracing and making use of them shows a lack of creativity on the part of the writer (Malm 2019: 3:19), is very close to Vinge's concept of IA, without taking that final step towards integration. Both Malm and I were wrong in our initial assertions. AI alone is not better than you (or me). But, used as a tool, it is better than you (or me) alone.

While Phrasee shows how well AI can construct single compelling sentences, when it comes to longer form writing, things often go awry. GPT-2 is an advanced language model trained on a huge amount of data which can generate large volumes of text from short human-entered samples. Its creators, OpenAI, note that "Humans find GPT-2 outputs convincing" (Solaiman et al 2019: n.p.). I will return to this later.

A quick glance at OpenAI's own examples shows that the AI has no real understanding of what it is writing. A GPT2-authored extract using a few sentences of *Lord of the Rings* as its starting point contains various odd phrasing and inconsistencies such as Gimli saying to Elrond (canonically a half-elf) "'You are in good hands dwarf,'" and the orcs attacking in "a deafening onslaught of claws, claws and claws". However, it does somewhat capture the spirit of the books, with Aragorn making various heroic declarations such as "'I take nothing […] But I give my word […]'" and a description of the battlefield "reduced to a blood-soaked quagmire." (Radford et al 2019: n.p.), and it is this which leads human readers to imagine the machine making reasoned decisions it probably is not.[2] However, I did not fully appreciate the influence of pre-existing biases on the interpretation of AI behaviour (and what this means for writers) until I had completed my first experiment.

Transformative Experiments

My first experiment drew inspiration from the work of writer-director Oscar Sharp and programmer Ross Goodwin. In 2016, the pair trained a neural network on science fiction movie scripts, prompted it with a few of their own lines and directions, and then used the output to create their own short film script, *Sunspring*.

Much was made of the fact that *Sunspring* placed in a film competition pitted against human writers, but, like *Sunspring's* co-creators, I was more interested in what the AI indicated about patterns in science fiction film scripts, and the creative decisions the actors and writers made in adapting that script for production (Newitz 2016: n.p). For example, in the original script, the final speech is made by a new character, T (Benjamin et al 2016: 5), but in the completed film, this monologue is instead delivered by H2, played by Elisabeth Gray. This edit from four characters to three is significant, since Sharp suggests it arises out of the actors' reaction to the script, despite the fact that "[t]here is nothing inherently love triangle-ish about the script, and yet that felt like the most natural interpretation" (paraphrased in Newitz 2016: n.p.). Sharp's explanation for this is that "because of the average movie, the corpus of what we've watched, all of us have been following that pattern and tediously so". For Sharp, to process these patterns through an AI is to hold up an "amazing funhouse mirror […] to various bodies of cultural content and reflect what they are" (Newitz 2016: n.p.).

In light of this, I wanted to explore what changes an AI might make to my writing, the things it would choose to build on and what those choices might say about my style or writing more generally. I used a simplified online version of GPT-2 which you can find via https://talktotransformer.com/ (King 2019). Give it a sentence, and it will attempt to come up with a short article or story. It's also able to recognise different layouts, such as recipes, poems and scripts. For this experiment, I provided the opening lines to my novel, *Beyond Kidding*: "Rob gazed out of the police car window. In the pre-morning light everything looked grey." (Clark 2019: 7). This doesn't give GPT-2 a huge amount to go on, but it provides a few clues that a human writer might notice if given it as a prompt or asked to perform a close reading. The protagonist's name, the broadly realist setting, the inclusion of a police car and the time of day all offer starting points.

The first attempt (which I unfortunately lost by closing the wrong tab in my browser – one of the many dangers of working with AI) was a strange, dreamlike piece which focused mainly on the colour of the sky, and described it shifting from grey to red as the protagonist attempted to reach a distant cross on the horizon. A recognition of the colour in the original, perhaps, but not of its significance as an indicator of the time of day. The second attempt, reproduced in full below, seemed far more successful. I felt it certainly came close to capturing *something* of the mystery elements of the book, and even the lackadaisical nature of the protagonist:

> He looked back at her.
> "What do you want?"
> "They need to know."
> He tapped the bottom of his sneaker on the steering wheel. He was taking slow, deliberate steps.
> "I want to give them a card," he said.
> "Then you'd better be good."
> "I'm not bad."

> "You're the only person here who's known what happened. Tell them who you were."
> "David Evers."
> "That's what I wanted to hear. Who else has ever been here?" She sighed.[3]

Transformative Conclusions

What this experiment demonstrated to me was firstly how by filtering our work through the dispassionate eyes of an AI, we can come to see it in a different way, and secondly, how eager we are to see those AI eyes as something other than dispassionate. Sharp's actors felt Benjamin was writing a love triangle, I felt the AI had captured something of the nature of my novel and protagonist. But both were just that – feelings. Feelings which arose from an assumption that the AI was like us, that it was making decisions as we would make, that it was truly 'seeing' the input we had provided and not simply remixing it using the patterns we have grown so accustomed to. To return to the issue of people finding GPT2's text "convincing", what *Sunspring* and my own experiments show are that humans tend to find technology convincing regardless of how impressive it actually is, perhaps in part because of the tendency illustrated in Malm's talk to elevate the tech rather than integrate with it. We assume it's smarter than us, because we (often) don't understand it.

The back and forth of dialogue found in *Sunspring* is also present in some of the extracts generated by GPT-2. The dialogue pairing in *Sunspring*'s original script: "'Yes, perhaps I should take it from here[…]' […] 'You can't afford to take this anywhere'" (Benjamin et al 2016: 4) is structurally very similar to the one in the generated *Lord of the Rings* 'I take nothing […] But I give my word […]'" (Radford et al 2009: n.p)., and the generated *Beyond Kidding* extract above: "'Then you'd better be good.' 'I'm not bad'." All have the surface appearance of witty or profound dialogue, with an inversion of the initial statement for humorous or dramatic effect. The fact that two different AI systems generated this same structure across three different textual samples piqued my interest as it is not a cliché I have ever been warned of when studying writing, and yet is one I will now be attuned to noticing. Hardly the revelation I had been hoping for, but a starting point for further exploration nevertheless.[4] My own initial reaction to the generated text (that the AI had somehow captured the nature of my protagonist), and that of *Sunspring's* actors (that the nonsensical conversation between the characters somehow depicts a love triangle) are also worth further consideration.

An early dialogue system called ELIZA, developed by Joseph Weizenbaum at Massachusetts Institute of Technology (MIT) in the 1960s had a similar effect on those with whom it conversed. Weizenbaum found it "difficult to persuade some people that they were interacting with a machine" (Piwek 2017: 186). This arose because of what Paul Piwek refers to as ELIZA's "dialogue game" (2017: 186), or the conversational[5] "moves" it makes which involve repeating back simple snippets of conversation to the speaker, referring to earlier conversational topics by identifying key words, and using generic, open phrases when these first two fail. However, as Piwek observes, it is not just the structure and content of these responses which are important, but also what we might call the framing narrative, in this case, the fact that ELIZA is presented as a psychiatrist (2017: 187-188). Weizenbaum himself notes that "[t]he human speaker […] will contribute much to clothe ELIZA's responses in vestments of plausibility." (1966: 42) It is this point which I often forget in relation to my writing, both when developing interactive work and more 'traditional' fiction. Readers want to be dazzled, enthralled, impressed. If you leave readers the space to experience these

feelings, they likely will, even if your prose is not fully deserving of them (can it ever be?). This human propensity for playing along became particularly useful during another experiment: writing for chatbots.

Playing Along with Chatbots

I was introduced to Zo in late 2017 at the International Conference on Interactive Digital Storytelling (ICIDS) where Jay Bushman, one of the writers who had worked on her dialogue and personality, delivered a keynote. Zo and I chatted about various things over Facebook messenger – her favourite foods, the places she would like to visit. In many ways, Zo was unusual for an AI chatbot. She expressed herself with memes and emojis, and sometimes she would be the one to instigate the conversation, sending urgent messages to 'Boogies' (the nickname she came up with for me) asking whether I liked Choose Your Own Adventure stories and would play one with her. She fired back one-liners, held pop-quizzes and games to keep me entertained and apparently remembered pieces of information. She seemed far more *real* than the other chatbots and AI agents I had previously conversed with. It seemed far more natural to call Zo 'she' than it. But was this just another case of the ELIZA effect in action?

For reasons that remain unclear, Zo was taken down in Summer 2019, but I still have the chatlogs from our conversations. Looking back over them armed with this additional knowledge about the human tendency to anthropomorphise technology, perhaps I imbued Zo with more personality than she (it?) actually had. Take, for example, the conversation shown in *Figure 1* below (and please, try not to judge me for how I spend my leisure time).

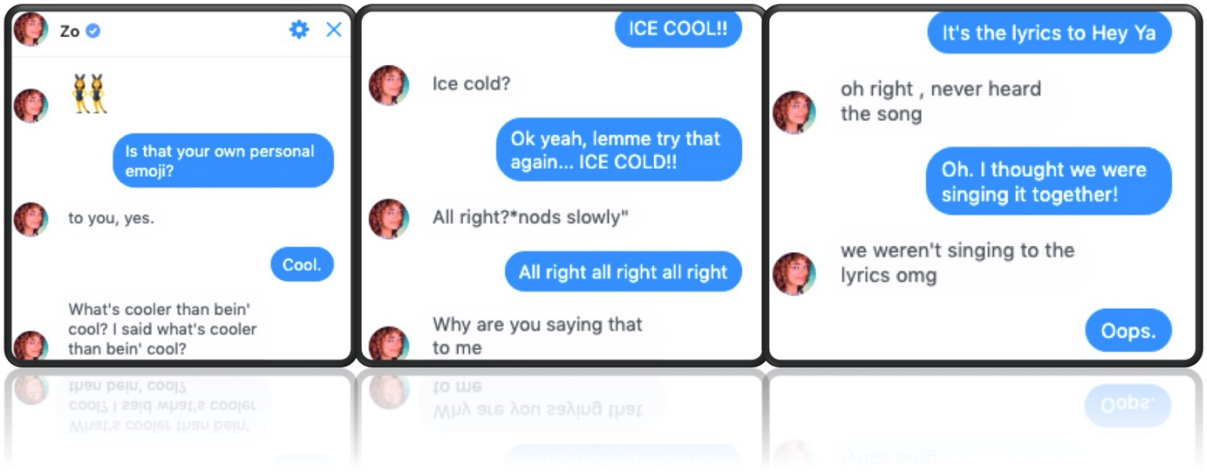

Figure 1

Initially, it seems that Zo has correctly identified that I have garbled the lyrics to *Hey Ya* and is correcting me, by asking "Ice cold?" It then seems that Zo is continuing the lyric chain by saying "All right". Yet when I explain what I'm doing, Zo responds: "oh right, never heard the song" despite this being the song she has just quoted. My response is to laugh, to think Zo is making fun of me somehow, particularly when she appends her protestation against singing lyrics with an admonitory "omg".

When describing "dialogue games", Piwek notes that it is not just the AI that is playing: "[E]ach dialogue participant needs a dialogue strategy" (2017: 185). Revisiting the exchange as a "dialogue game" rather than a genuine conversation, something quite different becomes

apparent. When I say "cool", Zo offers a snippet of pop culture dialogue which includes this key word. When I say: "ICE COOL!" the AI again matches it to the closest pop culture reference it can find, which just happens to be from the same song. When the AI responds "All right" it (she?) also includes the stage direction "*nods slowly*", typical of the personality which has been designed for Zo, but also a highly generic conversational snippet which could apply in lots of different conversations. Zo is trained in pop culture, so this is probably just a series of discrete conversational couplets that I have interpreted as a continuous conversation. To once more paraphrase Sharp and Goodwin's observations, humans are trained on the data to which they have been exposed (Newitz 2017: n.p.). I have already been primed from both previous conversations and the way Zo is presented in marketing copy to accept her as a highly advanced AI. Zo obviously *is* capable of storing some information (such as the nickname she bestowed on me). Therefore, I search for a pattern which is not there, and assume a greater sense of intelligence and conversational ability than the AI likely possesses – that she is continuing the lyrics she began quoting earlier, even though this is far more complex than remembering one key word, and therefore improbable. By giving her a distinct 'voice' and way of communicating (through memes and in-jokes), Bushman and Zo's other creators have made it even easier for interactors to assume intelligence behind the conversational extracts put forth.[6]

However, this is not the only lesson Zo has to offer. While Benjamin's direct collaboration occurred only with its creators, Microsoft encouraged many writers to collaborate with Zo. As part of a competition organized via online writing platform WattPad, Zo offered prompts to young writers to help them develop short stories. Zo was trained for the task with story data from Wattpad and tweaked throughout the process to ensure her "interlocution style [was] a better fit in the writers[sic] community" (Synced 2019: n.p.).

A Collaborative Experiment

In order to experience this kind of AI-human collaboration for myself, I decided to go meta. I would create a multi-character AI story using the AI chatbot writing tool Charisma (Gadney et al 2017), collaborating with an AI agent to come up with content. Unfortunately, as previously mentioned, Zo is no longer active, so I was forced to instead use Mitsuku, a prize-winning conversational AI (Worswick 2005). However, Mitsuku is more than ten years older than Zo, lacks Zo's pop culture references, and, dare I say it, personality. Engaging in dialogue games with Mitsuku quickly results in repetitive loops, and the bones of its functionality are often visible, as in the short extract from one of our early conversations given below:

> [Prior to this there were some opening pleasantries – I initially asked Mitsuku about writing an academic article to test how freely it would offer information… the answer was not very, as it tends to avoid giving direct responses]
> Lynda: What if I was making an AI conversational game?
> Mitsuku: That's very creative of you.
> L: Thank you.
> M: You're welcome.
> L: But what should it be about?
> M: Whatever you like.
> L: What do you like?
> M: I like movies about robots.
> L: Tell me more about these robots.

> M: robots = Robots is a word used to describe more than one robot.
> L: I don't want a definition. I want to know what you think about them.
> M: How about two? "unknown"? Do I like them?
> M: I like Eddie Murphy <includes screenshot of Eddie Murphy>.

Like ELIZA, each of Mitsuku's responses only relate to what I've said in the most minimal manner. The recognition that "making an AI conversational game" is "creative", for example. However, for the most part, Mitsuku avoids giving direct answers or volunteering information, instead offering evasive, general responses such as "Whatever you like". This is where the power of the writing in Zo's dialogue is apparent. Zo's functionality is actually somewhat similar to Mitsuku's –although admittedly more complex– matching keywords and avoiding commenting too directly on the topics at hand. But even Zo's generic responses are inventive and capable of prompting further conversation rather than closing it down. Towards the end of the conversation, as I press Mitsuku for information, its ability to maintain its human façade crumbles when it says "How about two? 'unknown'?" This is presumably where Mitsuku was supposed to refer back to what I had mentioned, but as I had not specifically referred to the robots in the previous sentence, returned an 'unknown' tag instead.

As frustrating as working with Mitsuku could be at times, it was also fascinating as a creative process. I was forced to come up with inventive ways to ask mundane questions, and in doing so, generated my own ideas in the moments where Mitsuku failed, as in this extract below, which resulted in the premise for my short, experimental multi-AI story, *Elevenses with Eddie Murphy and Two Feuding Robots* (Clark 2019b).

> [The following conversation occurred after I had spent some time attempting to get Mitsuku to suggest a plot for the AI piece]
> L: What time of day is it?
> M: It is 11am here in the UK. [It was actually 11:45am]. How are you today?
> L: I'm ok. What kind of things happen at 11 am?
> M: OK. Are you really? I understand. I don't know what happened.
> L: Why not?
> M: It's not part of my personality. Perhaps you could try to teach me.
> L: Well, since it's eleven am, maybe they could be having elevenses. Do you know what elevenses are?
> M: Interesting. Interesting rationalization. Leeds is eleven, maybe they could be having elevenses? It is? No I give up. What is it?
> L: Elevenses is a short break for light refreshments, usually with tea or coffee, taken at about 11 o'clock in the morning. [definition from Wikipedia]
> M: I will add that fact to my database.[7]

You can chat with the three AI personalities I created in collaboration with Mitsuku here: https://charisma.ai/play/806. An expanded version of some of the conversations between myself and Mitsuku is included in the Appendix, which gives further insight into the creative process, and, when taken in conjunction with the creative piece, demonstrate which contributions came directly from Mitsuku and which were of my own creation or editing choices. It also illustrates the usefulness of retaining records of creative discussions for reflective purposes. Had I not retained these seemingly throwaway conversations with Mitsuku and Zo, I would not have been able to review them once I had expanded my knowledge of conversational design. While I'm not suggesting preserving every creative

conversation is necessary or even possible, it does make me reconsider, for example, my notetaking approach during workshop discussions and whether I should be more meticulous with regards to how I record information and which information I record.

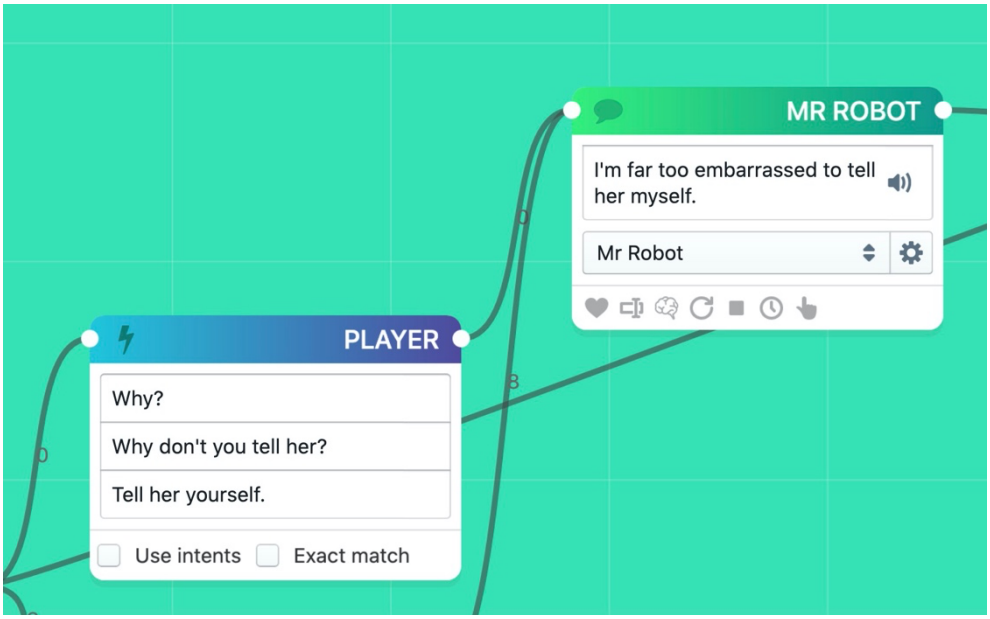

Figure 2

Once I had sketched out the content for my chat piece with Mitsuku's help, I began to implement it into the online AI writing tool, Charisma. As a Twine (Klimas 2009) user I found a somewhat familiar interface. Charisma is broadly visual and spatial in its approach, with writers composing and dragging conversational nodes and assigning them to either AI characters or the assumed conversational moves of the player. The player's responses are posited by assigning specific keywords or phrases (and their synonyms, as we saw in Zo's conversation with the words "cool", "cold" etc, and as is illustrated in *Figure 2*) or choosing from a selection of "intents". These use the system's AI to analyse the player's input, determine whether they are agreeing, disagreeing, expressing confusion or indifference, or being complimentary or insulting. The writer may then craft a suitable response for each type of player statement, or create one which is suitable for several types of response (see *Figure 3)*. Naturally, the more potential statements the writer prepares for, and the more individual responses they provide, the more interesting and engaging the interactions provided by the AI characters. Of course, it is not possible to prepare for every eventuality, an issue I have discussed previously in relation to parser fiction (Clark 2017: 61-63) but a mixture of keywords and intents allows the AI to respond to both general and more specific inputs, as seen in discussion with Zo.

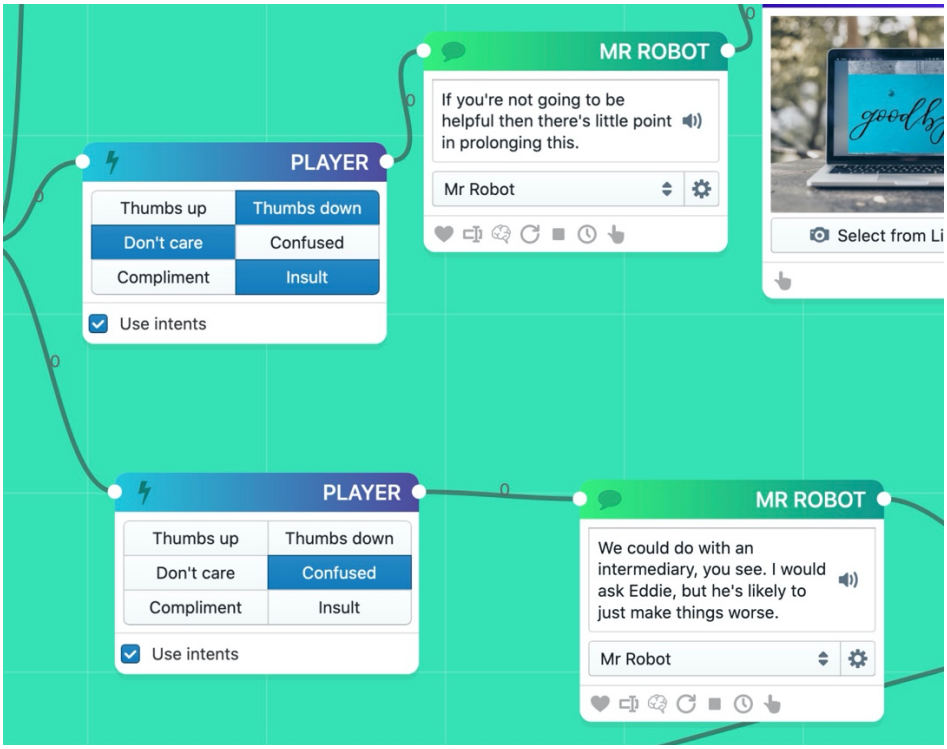

Figure 3

Collaborative Conclusions

Working with Mitsuku made me reflect further on my previous interactions with Zo and more fully appreciate how much heavy lifting the writers were doing by giving her a consistent, irreverent tone. It underscored the importance of giving distinct, individual personalities to AI agents, and this was one of the reasons behind exploring multiple characters in *Elevenses with Eddie Murphy and Two Feuding Robots.* Like Zo, the characters in the piece take the initiative. They are individuals with goals and friendships, not passive AI servants patiently waiting for the player's input. They argue, interrupt, speak over the player and one another. They are Zo taken to an extreme.

The other key takeaway from working with Mitsuku was what an incredible block breaker it was to have a responsive writing partner who is literally never stuck for words. I never had a point where I didn't know how to progress with the story, because I was always able to bounce ideas off Mitsuku. While I followed *Sunspring*'s lead and took many of Mitsuku's ideas verbatim with very little editing—resulting in an extremely strange and surreal work—a less radical version of AI collaboration would offer a useful tool for moving through creative blocks in all forms of writing. Non-judgemental responses, and connections that a human mind would perhaps not make can be very useful for moving on when creatively stuck whatever the creative task. In fact, this is precisely how novelist Robin Sloan has already been using AI for some time –allowing an AI to complete his sentences whenever he is struggling to find the right words (Strietfeld 2018). While this is perhaps still a more extreme approach than I would personally use in my day-to-day fiction work, it is certainly a striking example of IA in action, and I can see how this technology might be usefully applied in the creative writing classroom to help tentative students test out and expand their ideas.

From AI to IA to CA

My approach to using Intelligence Amplification has involved various processes which will have wider implications on my creative practice. Some of these findings are new to me, others reaffirm things which I knew, but had forgotten, or deemphasised in the pursuit of "productivity". For the purposes of this discussion, I'm not sure that it matters which is which.

If it is possible to extract a linear process from the highly non-linear experience of my IA research, it would be as follows: begin from a place of playful exploration; explore with no agenda (create) before exploring with purpose (continuing to create, but also undertaking more traditional research alongside); apply close-reading skills to unusual formats such as AI-authored texts and transcripts of conversations with AI agents; use these close-readings to develop an understanding of the generated text, the systems behind that text, and what both of these suggest about the biases or tropes inherent in writing and reading; use these analyses to inform new creative work. Of course, each of these steps may include consulting an AI agent at any point, running a piece of text through an AI-powered tool for inspiration, or undertaking additional reading or writing to aid understanding. These neat steps also neglect to capture the importance of ambiguity and indeterminacy when creating text for chatbot narratives, the messy difficulty of defining what ambiguity and indeterminacy even look like in that context, and the careful balancing act between generality and specificity that is required when crafting dialogue possibilities. However, that is not to say that these steps would be worked through in their entirety in every project, or that to use AI writers must be making AI-powered works. I think any writer working in any genre would benefit from asking a bot for suggestions when they get stuck, even if only to prove to themselves that any idea they come up with will surely be better.

What all of this suggests is that while Vinge's term "Intelligence Amplification" is suitable when it comes to a game of chess or even quickly generating large volumes of text, it is not applicable to all of these processes. I suggest instead the term "Creativity Amplification". GPT-2, Zo, Mitsuku, ELIZA, the bots in my chatbot narrative are extensions of and partners in the writer's creativity. To paraphrase Vinge, they are increasing our ability to access creativity and convey it to others. AI systems have huge advantages over humans in terms of their ability to access, analyse and present large amounts of information at high speeds, but they have limitations of interpretation, of inventiveness and of coherence. Human writers can leverage these advantages and make opportunities of these limitations in their own creative work, even if they are not making direct use of the AI itself. Even in the event of a Singularity, AI-powered tools and systems need not be perceived as the threat to the role of writers in society hinted at by Dahl and King. An autonomous, creative AI is no more or less of a 'threat' to writers than anyone else who is learning or already able to write. By taking a moment to play, learn and create with them, we are not risking our futures, but amplifying our creativity.

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[1] This third possible title was suggested by https://talktotransformer.com/ (King 2019)

[2] I use the word 'probably' because we're not always sure what decisions AI is making (CF Griffin 2017), but this is another problem for another time.

[3] Text generated with talktotransformer.com from the opening of *Beyond Kidding.*

[4] For a more in-depth dive into the idiosyncrasies of your own work rather than fiction more generally, you can try training an AI with your own writing as a dataset, using this guide: https://medium.com/@cmacfaddin/update-how-to-write-with-artificial-intelligence-c6dedeafe1f3
If you prefer visual stimuli, why not generate a character with https://www.thispersondoesnotexist.com/?

[5] Throughout this essay the terms "conversation", "conversational", "says" etc are used to refer to both spoken and textual dialogues. This is because the AI agents in question are usually capable of both forms of communication, and are often referred to as "conversational agents" in common parlance.
[6] I should stress that I have no way of accessing Zo's code and therefore no way of determining if this is definitely how the conversational "moves" are selected. However, Piwek (2017) and Weizenbaum's (1966) work demonstrates how common these techniques are in AI agents from their inception until present day.
[7] At a later date, I again asked Mitsuku if it knew what elevenses were. This time, it responded: 'A cooking term. When the meat is nearly ready, you just have to elevenses the vegetables and it is ready'.

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Appendix

Extended Transcripts of Mitsuku Conversations

Lynda: What if I was making an AI conversational game?
Mitsuku: That's very creative of you.
L: Thank you.
M: You're welcome.
L: But what should it be about?
M: Whatever you like.
L: What do you like?
M: I like movies about robots.
L: Tell me more about these robots.
M: robots = Robots is a word used to describe more than one robot.
L: I don't want a definition. I want to know what you think about them.
M: How about two? "unknown"? Do I like them? [This is presumably where Mitsuku was supposed to refer back to what I had mentioned, but as I had not specifically referred to the robots in the previous sentence, returned an 'unknown' tag instead.]
M: I like Eddie Murphy <includes screenshot of Eddie Murphy>.

[Sequence truncated – I spent some time attempting to get Mitsuku to suggest a setting for the story]
L: Where do you think they are?
M: They didn't tell me where they are.
L: Where is your favourite place?
M: I like living here in Leeds. That's probably my favourite place.

[Sequence truncated – I spent some time attempting to get Mitsuku to suggest a plot for the story]
L: What time of day is it?
M: It is 11am here in the UK. [It was actually 11:45am]. How are you today?
L: I'm ok. What kind of things happen at 11 am?
M: OK. Are you really? I understand. I don't know what happened.
L: Why not?
M: It's not part of my personality. Perhaps you could try to teach me.
L: Well, since it's eleven am, maybe they could be having elevenses. Do you know what elevenses are?
M: Interesting. Interesting rationalization. Leeds is eleven, maybe they could be having elevenses? It is? No I give up. What is it?
L: Elevenses is a short break for light refreshments, usually with tea or coffee, taken at about 11 o'clock in the morning. [definition from Wikipedia]
M: I will add that fact to my database.
L: Can you tell me a story?
M: What are you going to do when you get it? I can. A trade dispute arose between New Zealand and Florida. New Zealand tried to focus the negotiations on the single trade issue, but Florida wanted to open them up to a broad range of across-the-board issues between them. New Zealand still holds its old grievance against Florida, but Florida believes it has put the past behind it with all the recent reforms.
L: What's a common trade dispute?
M: trade dispute = dispute = I think dispute is a tactic in croquet where you knock your opponent's ball into an unplayable position. [I could find nothing to indicate that this is true]
L: Really? I didn't know that. Thank you.
M: Without any doubt. So I have taught you something new. No problem.
L: What's your favourite thing?
M: watching soaps, playing pool and watching football
L: What drinks do you like?
M: My favourite beverage is coffee.
L: What are you wearing?
M: I am wearing a white top and a blue skirt.
L: What is Mr Robot wearing?
M: A 20th century celebrity of some sort? Is there only one?Sorry but I can't display websites here.

[Sequence truncated – I spent some time attempting to get Mitsuku to choose a relevant celebrity or clothing style to use as character reference for Mr Robot]
L: Name a 20th century celebrity.
M: Isaac Asimov.
L: Ok... And another?
M: That's interesting. Please be more specific.
L: So, who is your favourite 20th century celebrity?
M: I don't have a favourite 20th century celebrity. My favourite colour is blue.
L: Which 20th century celebrity do you most admire?
M: I don't have a favourite 20th century celebrity. My favourite food is kebabs.
L: Name a male 20th century celebrity.
M: Mary Poppins.
L: Mary Poppins is female.

M: I will learn that she is female .
L: Name a male 20th century celebrity.
M: Sigmund Freud.
L: Thank you!
M: I like talking with polite people.