Application to the ICCC Doctoral Consortium

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Overview

New emergent technologies offer exciting new opportunities for how we can interact online. In particular, generative AI models, such as generative adversarial networks (GANs), allow for new methods of humans and machines to co-create. These new models are of critical importance to society, from Deepfakes undermining our ability to discern truth from falsehood (Groh et al. 2022) to new modes of creativity (Epstein et al. 2020a). My research project focuses on exploring the affordances of GAN-generated media for social interaction. In service of this goal, I have explored how social contexts intersect with AI-generated media in a series of different settings, from the role of interface design and social cues on the evolution of AI-generated imagery to using GAN-based methods to help communities envision the future. Crucial to this research project is questions of authorship, credit and responsibility (since AI-generated media by its very nature complicates the notion of a single authorship), which I have explored as well.

Meet the Ganimals

The first component of this project is an online platform I built called Meet the Ganimals, designed for the exploration and curation of AI-generated hybrid animals (e.g. "ganimals" see Figure 1). The platform was designed as a citizen science tool to study how (g)animal morphology relates to perceptions of cuteness and popularity. We incubated the platform at the Casual Creators workshop, where we focused on its ability for laypeople to engage creativity with new AI tools (Epstein et al. 2020a).

The platform also uses climate fiction (cli-fi) narrative storytelling to transport users to a new reality: it takes place in a future drowned Seattle where protagonist Tara Darwin discovers lost creatures in her great grandmother's server. The website went viral, and from April 26th to June 26th 2020, 44,791 ganimals were generated, 8,547 ganimals were bred, and 743 ganimals were named by a total of 10,657 users. In the Feed 'Em page 2,370 votes were placed on 434 ganimals by 549 users.

We also embedded a randomized experiment on the platform which varied the social cues of popularity, and the visual layout (either a newsfeed-like list or a new cloud layout) (Epstein et al. 2021). Users were randomly assigned to one of sixteen worlds, each of which had a local ecology

Figure 1: Interpolations of BigGAN to create hybrid animals.

that evolved independently of the others. We found that social influence led to a winner-take-all market where a few ganimals dominated the rest. This result is important because it suggests that people use social signals more than their own priors/preferences to determine what ganimals to engage with. We also found that without social influence, worlds converged to ganimals with a singular set of features that conform to morphological conventions of quality (e.g. eyes, a head, and doglike features). With social influence however, worlds rapidly formed local cultures that diverged from this status quo. In a world where "charismatic megafauna" - animals with features conventionally associated with popularity - absorb conservation funds, our work suggests that social influence could be a key tool to invigorate attention and conservation of "ugly" animals.

Figure 2: Four images from the following prompts: Biophilic vertical gardens lining neighborhood roads, creating function and beautiful public spaces (left), Public spaces: solidarity-building. The intersection of oceans and relationships. Publicly accessible oceanic vistas (center left), Holistic traditional medicine as an art form (center right), Dye the ocean purple to prevent global warming (right)

AI-generated media for collaborative speculation

The second component of this project is a research study investigating the capabilities of these models to help communities engage in conversations about their collective future[1]. In particular, we designed and deployed a facilitated experience where participants collaboratively speculate on utopias they want to see, and then produce AI-generated imagery from those speculations (see Figure 2). In a series of in-depth user interviews, we invited participants to reflect on the generated images and refine their visions for the future. We observed that participants often generated ideas for how to implement their vision and drew new lateral considerations as a result of viewing the generated images. Critically, we also found that the unexpected difference between the participant's imagined output and the generated image is what facilitated new insight for the participant. We hope this experimental model for co-creation, computational creativity, and community reflection inspires the use of generative models to help communities and organizations envision better futures.

Ownership and credit for AI-generated media

Both of the above approaches use GAN-based technology to explore new forms of social mediation. However, these new modes of human-machine co-creation require thinking through the thorny question of ownership and authorship for such AI-generated media. I have explored this question through both controlled survey experiments, and building speculative computational creativity systems.

Who gets credit for AI-generated art?

In a series of vignette-based survey experiments, we explored how anthropomorphizing an AI (e.g. endowing it with humanlike characteristics) can impact perceptions of credit and responsibility to the human actors involved in generated AI Art (Epstein et al. 2020b). We found that there

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[1]forthcoming as a short paper in ICCC this year (Epstein, Schroeder, and Newman 2022)
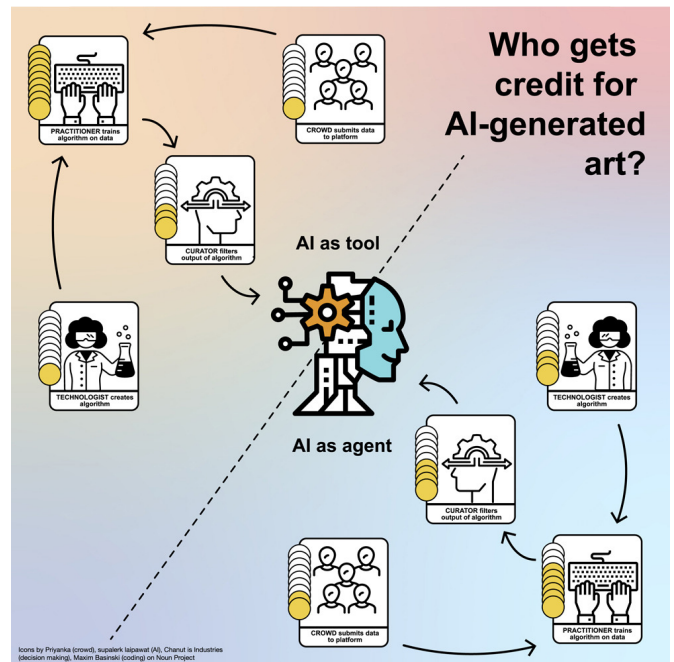

Figure 3: Anthropomorphizing an AI (e.g. endowing it with human-like characteristics) can impact the allocation of credit to the humans involved in the creation process.

is baseline variation in the extent to which people perceive AI as anthropomorphic: some perceived the AI as a tool a human artist used, while others perceived it as an agentic being. We also found that not only was this perception of anthropomorphicity related to how people allocated responsibility to the humans involved in producing AI art, but also that this perception of AI anthropomorphicity could be manipulated by simply changing how it was discussed. Anthropomorphizing AI can undermine our capacity to hold people responsible for the wrongdoings of sociotechnical systems when the AI system commits a moral transgression: the perceived agency of the AI could be a sponge, absorbing re-

sponsibility from the other human stakeholders, which has important implications for how we discuss and frame AI. Featured in articles in Forbes and ZDNet, we hope these results are a call for academics, journalists and the public to be more responsible with how we collectively frame AI.

Co-creation and ownership for AI radio

I have also explored this in the context of AI-generated music by building Artificial.fm, a casual creator that blends AI-music generation, subjective ratings, and personalized recommendation for the creation and curation of AI-generated music [2]. With Artificial.fm, listeners could rate emergent songs to steer the evolution of future music. They can also personalize their preferences to better navigate the possibility space. As a "slow creator" with many human stakeholders, Artificial.fm is an example of how casual creators can leverage human curation at scale to collectively navigate a possibility space. It also provides a case study to reflect on how ownership should be considered in these contexts. In particular, in collaboration with Harvard Law School lawyers, we analyzed the legal precedent for AI-generated music, and provided a legal analysis on the ownership of artifacts generated on the platform.

Looking Forward

I hope to continue to explore how cutting-edge new AI technologies can be used as computational creativity systems embedded in social contexts. In light of the NFT revolution, I have been working with Botto, a AI art DAO to see how collective intelligence approaches can improve the creativity of their outputs. I am also particularly motivated by the climate emergency, and using generative models to help people become more aware and motivated to engage in climate solutions. I am currently collaborating with Extinction Rebellion on making a web app that uses generative media to image alternative futures based on what we do in the next 10-20 years.

References

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[2]forthcoming as a short paper in ICCC this year (Gordon, Mahari, and Epstein 2022)