HAI-GEN 2021: 2nd Workshop on Human-AI Co-Creation with Generative Models

Werner Geyer
IBM Research AI
Cambridge, Massachusetts
werner.geyer@us.ibm.com

Lydia B. Chilton
Columbia University
New York City, New York
chilton@cs.columbia.edu

Justin D. Weisz
IBM Research AI
Yorktown Heights, New York
jweisz@us.ibm.com

Mary Lou Maher
UNC Charlotte
Charlotte, North Carolina
m.maher@uncc.edu

ABSTRACT

Recent advances in generative AI have resulted in a rapid and dramatic increase to the fidelity of created artifacts, from realistic-looking images of faces [10] to antimicrobial peptide sequences that treat diseases [5] to faked videos of prominent business leaders [4, 11]. We believe that people skilled within their creative domain can realize great benefits by incorporating generative models into their own work: as a source of inspiration, as a tool for manipulation, or as a creative partner. Our workshop will bring together researchers and practitioners from both the HCI and AI disciplines to explore and better understand the opportunities and challenges in building, using, and evaluating human-AI co-creative systems.

CCS CONCEPTS

• **Human-centered computing** → **Human computer interaction (HCI)**; *Interaction design*; • **Computing methodologies** → **Artificial intelligence**; • **Applied computing** → *Arts and humanities.*

KEYWORDS

Generative modelling, artificial intelligence, generative design, user experience, collaboration, creativity

ACM Reference Format:
Werner Geyer, Lydia B. Chilton, Justin D. Weisz, and Mary Lou Maher. 2021. HAI-GEN 2021: 2nd Workshop on Human-AI Co-Creation with Generative Models. In *26th International Conference on Intelligent User Interfaces Companion (IUI '21 Companion), April 13–17, 2021, College Station, TX*. ACM, New York, NY, USA, 3 pages. https://doi.org/10.1145/nnnnnnn.nnnnnnn

1 DESCRIPTION

Recent advances in generative AI through deep learning approaches such as generative adversarial networks (GANs) [6], variational autoencoders (VAEs) [9], and language models [7] will enable new kinds of user experiences around content creation. These advances have enabled content to be produced with an unprecedented level of fidelity. Goodfellow's work on face generation [6] and StyleGan [8], OpenAI's GPT-3 [3] model, and recent deep fake videos of Mark Zuckerberg [4] and Bill Gates [11] are all prominent examples of the state of the art in the generation of text, image, and video content. In many cases, content generated by generative models is either indistinguishable from human-generated content or could not be produced by human hands. These examples also highlight some of the significant societal, ethical, and organizational challenges generative AI is posing around issues such as security, privacy, ownership, quality metrics, and evaluation of generated content.

While the areas of computational creativity, generative design, and computational art have existed for some time (e.g. [1, 2]), these communities have not been grounded at the intersection of generative deep learning approaches and human-computer interaction.

The goal of our workshop is to bring together researchers and practitioners from the domains of HCI & AI to establish a joint community to deepen our understanding of the human-AI co-creative process and to explore the opportunities and challenges of creating powerful user experiences with deep generative models. We envision that the user experience of creating both physical and digital artifacts will become a partnership between people and AI: people will take the role of specification, goal setting, steering, high-level creativity, curation, and governance, whereas AI will augment human abilities through inspiration, creativity, low-level detail work, and the ability to design at scale.

The central question of our workshop is *how can we build co-creative systems that make people feel that they have "creative superpowers"?* How will user needs drive the development of generative AI algorithms, and how can the capabilities of generative models be leveraged to create effective co-creative user experiences?

Submissions will take the form of short papers, long papers, and demos, following the IUI paper and demo guidelines. Submissions are encouraged, but not limited to, the following topics:

- Novel, AI-augmented user experiences that support the creation of physical and/or digital artifacts
- Business use cases & novel applications of generative models
- Techniques, methodologies, & algorithms that enable new user experiences and interactions with generative models and allow for directed and purposeful manipulation of the model output

IUI '21 Companion, April 13–17, 2021, College Station, TX

ACM ISBN 978-x-xxxx-xxxx-x/YY/MM.
https://doi.org/10.1145/nnnnnnn.nnnnnnn

- Issues of governance, privacy, and ownership of AI-generated or human-AI co-created content
- Security, including forensic tools and approaches for deep fake detection
- Evaluations of human-AI co-creative processes and quality metrics of AI-generated or human-AI co-created content
- User research on needs & algorithmic requirements for co-creative systems, perceptions of human-AI co-creative systems, trust of co-creative tools & artifacts, and/or implications for HCI theories
- Lessons learned from computational art & design and generative design, and how these impact research

2 ORGANIZERS

Werner Geyer is a Principal Research Staff Member and Research Manager at IBM Research in Cambridge, MA, where he is leading a research team centered around AI Interaction technologies. He's been holding various roles as co-chair at ACM RecSys, including general chair as well as a series of workshops and tutorials on Social Recommender Systems. More recently, his team is exploring generative modelling techniques in business settings. https://researcher.watson.ibm.com/researcher/view.php?person=us-Werner.Geyer, *werner.geyer@us.ibm.com*

Lydia B. Chilton is an Assistant Professor in the Computer Science Department at Columbia University. For ten years she was a leader in the crowdsourcing research space of HCI, now she breaks down problems for a combination of people and AI to solve. She organized the first CHI Workshop on Crowdsourcing and Human Computation, which had over 100 attendees. She has lead the 2-day crowdsourcing workshop and hackathon, CrowdCamp 3 times. www.cs.columbia.edu/~chilton/, *chilton@cs.columbia.edu*

Justin D. Weisz is a Research Staff Member and Research Manager at IBM Research in Yorktown Heights, NY. He leads the Human-AI Collaboration team, whose mission is to design, build, and rigorously investigate new forms of human-AI partnerships that enhance and extend human capabilities. He also leads the HCI research strategy within the AI organization, as well as a new project exploring enterprise use cases of generative AI technologies. https://researcher.watson.ibm.com/researcher/view.php?person=us-jweisz, *jweisz@us.ibm.com*.

Mary Lou Maher is a Professor and Director of the HCI Lab in the College of Computing and Informatics at UNC Charlotte. She has a joint appointment in the Department of Software and Information Systems and the School of Data Science. Her research in computational creativity extends genetic algorithms, analogical reasoning, and more recently deep learning models to automate the generation of creative designs and respond to the question: Can computers be creative? Her research in HCI has lead to a complementary focus in computational creativity to design and evaluate interaction models for co-creative systems and respond to the question: Can computational creativity enhance human creativity? http://maryloumaher.net, *m.maher@uncc.edu*.

3 PREVIOUS HISTORY

HAI-GEN 2020. We organized the first HAI-GEN Workshop at IUI'20. Although IUI was canceled due to COVID-19, we held a successful online workshop with two keynotes via WebEx with proceedings currently being published at CEUR. https://hai-gen2020.github.io

Machine Learning for Creativity and Design. Draws 200-300 participants and has been around since 2017, but is focused more on art and design. https://neurips2019creativity.github.io/

GANocracy First held in 2019 and drew 50 participants. Members of our OC and PC were involved in its organization. The content specifically focused on algorithmic approaches (e.g. GAN). http://ganocracy.csail.mit.edu/

Art in the Age of Algorithms. Local group at Columbia focused on computational art and design. https://engineering.columbia.edu/news/art-age-algorithms

4 WORKSHOP PROGRAM COMMITTEE

- Maya Ackerman, Santa Clara University
- Nancy Baym, Microsoft Research
- Zoya Bylinskii, Adobe Research
- Elizabeth Clark, University of Washington
- Peter Daalsgard, Aarhus University
- Nick Davis, UNC Charlotte
- Sebastian Gehrmann, Google
- Katy Gero, Columbia University
- Kaz Grace, The University of Sydney
- Anna Kantosalo, Aalto University
- Michael Mateas, University of California, Santa Cruz
- Michael Muller, IBM Research AI
- Dafna Shahaf, Hebrew University of Jerusalem
- Hendrik Strobelt, IBM Research AI
- Haiyi Zhu, Carnegie Mellon University

5 PARTICIPANTS

We expect between 40-50 participants. Last year we had 35 participants at our virtual event, and participation was by invitation only. We could have attracted more people if desired. We will announce the workshop through major ACM HCI and AI mailing lists such as chi-announcements, and relevant conferences including the ACM Creativity and Cognition and the ACC International Conference on Computational Creativity. We will also recruit from the participants of previous related workshops (see above), as well as announce the workshop through the organizers' internal organizational channels (IBM Research, Columbia, UNC Charlotte) and through our PC.

6 WORKSHOP FORMAT & LENGTH

The workshop will take the form of a **full-day mini conference** with a selection of keynote speakers, paper presentations, demos, and poster sessions. We will provide ample time for discussion, with breakout groups to brainstorm goals and agendas for future research on the main topics of the workshop. The mixed session format will enable participants to learn, collaborate, and plan for future collaboration.

Given our successful first virtual workshop in 2020, we are ready and prepared to hold this workshop virtually again through WebEx, or any other virtual conference system IUI may provide, along with collaboration tools such as Miro and Slack.

REFERENCES

[1] 2019. Machine Learning for Creativity and Design. https://neurips2019creativity.github.io/

[2] 2020. International Conference on Computational Creativity. http://computationalcreativity.net/iccc20/

[3] Tom B Brown, Benjamin Mann, Nick Ryder, Melanie Subbiah, Jared Kaplan, Prafulla Dhariwal, Arvind Neelakantan, Pranav Shyam, Girish Sastry, Amanda Askell, et al. 2020. Language models are few-shot learners. *arXiv preprint arXiv:2005.14165* (2020).

[4] Samantha Cole. 2019. This Deepfake of Mark Zuckerberg Tests Facebook's Fake Video Policies. https://www.vice.com/en_us/article/ywyxex/deepfake-of-mark-zuckerberg-facebook-fake-video-policy

[5] Payel Das, Kahini Wadhawan, Oscar Chang, Tom Sercu, Cicero Dos Santos, Matthew Riemer, Vijil Chenthamarakshan, Inkit Padhi, and Aleksandra Mojsilovic. 2018. Pepcvae: Semi-supervised targeted design of antimicrobial peptide sequences. *arXiv preprint arXiv:1810.07743* (2018).

[6] Ian J. Goodfellow, Jean Pouget-Abadie, Mehdi Mirza, Bing Xu, David Warde-Farley, Sherjil Ozair, Aaron C. Courville, and Yoshua Bengio. 2014. Generative Adversarial Nets. In *NIPS*.

[7] Sepp Hochreiter and Jürgen Schmidhuber. 1997. Long Short-Term Memory. *Neural Comput.* 9, 8 (Nov. 1997), 1735–1780. https://doi.org/10.1162/neco.1997.9.8.1735

[8] Tero Karras, Samuli Laine, and Timo Aila. 2018. A Style-Based Generator Architecture for Generative Adversarial Networks. *ArXiv* abs/1812.04948 (2018).

[9] Diederik P. Kingma and Max Welling. 2013. Auto-Encoding Variational Bayes. *CoRR* abs/1312.6114 (2013).

[10] James Vincent. 2018. These faces show how far AI image generation has advanced in just four years. https://www.theverge.com/2018/12/17/18144356/ai-image-generation-fake-faces-people-nvidia-generative-adversarial-networks-gans

[11] James Vincent. 2019. Listen to this AI voice clone of Bill Gates created by Facebook's engineers. https://www.theverge.com/2019/6/10/18659897/ai-voice-clone-bill-gates-facebook-melnet-speech-generation