EXTENDED-ABSTRACT

Dark Sides: Envisioning, Understanding, and Preventing Harmful Effects of Writing Assistants - The Third Workshop on Intelligent and Interactive Writing Assistants

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Published: 11 May 2024

CHI '24: CHI Conference on Human Factors in Computing Systems
May 11 - 16, 2024
HI, Honolulu, USA

Conference Sponsors:
SIGCHI

https://doi.org/10.1145/3613905.3636312
ISBN: 9798400703317

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ABSTRACT

Writing assistants are becoming increasingly sophisticated and ubiquitous, fueled by advances in artificial intelligence, particularly large language models. As new use cases and models emerge, we expect the adoption rate to accelerate. This brings a sense of urgency to understanding not just the benefits, but also the potential *dark sides* of intelligent writing assistants. In this interdisciplinary workshop, we will explore the challenges and dark sides that our communities may have to consider as we design and deploy new tools and technologies, as well as how to prevent them. We will build off the successful workshop at CHI23 (The Second In2Writing Workshop), bringing new voices to the vibrant community of writing tools researchers established there, and building on the design space created by prior workshop participants. We invite writers, educators, researchers, industry practitioners, students, and anyone interested in creating, using, and testing future writing assistant technologies to join the conversation.

CCS CONCEPTS

• **Human-centered computing**; • **Computing methodologies** → **Natural language processing**;

KEYWORDS

Writing assistants, Writing support tools, Creativity support tools, AI-assisted writing, Human-AI interaction, Language models, Human-computer interaction, Natural language processing

CHI EA '24, May 11–16, 2024, Honolulu, HI, USA

ACM ISBN 979-8-4007-0331-7/24/05.
https://doi.org/10.1145/3613905.3636312

ACM Reference Format:
Minsuk Chang, John Joon Young Chung, Katy Gero, Ting-Hao 'Kenneth' Huang, Dongyeop Kang, Vipul Raheja, Sarah Sterman, and Thiemo Wambsganss. 2024. Dark Sides: Envisioning, Understanding, and Preventing Harmful Effects of Writing Assistants - The Third Workshop on Intelligent and Interactive Writing Assistants. In *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (CHI EA '24), May 11–16, 2024, Honolulu, HI, USA.* ACM, New York, NY, USA, 6 pages. https://doi.org/10.1145/3613905.3636312

1 MOTIVATION

Writing is a critical skill in daily life and professional environments. It provides means for communicating with family, friends, and colleagues, sharing information, as well as enhancing learning and emotional well-being [1, 2, 6, 8]. Writing also underlies a wealth of cultural activity from poetry to political commentary. However, writing is oftentimes a challenging endeavor. From language learners to journalists, almost everyone struggles in some way with the translation of amorphous ideas in our mind into coherent words on the page. For instance, writers often struggle to find appropriate phrasing, set the right tone, organize their thoughts logically, and in general, find ways to convey their thoughts clearly to be properly understood.

Nowadays, many writing assistants are seamlessly integrated into our personal devices (e.g., cell phones and laptops) and software (e.g., word processors and email clients) to support our writing process.[1] Some writing assistants (e.g., Grammarly and Wordtune) can be installed as browser extensions and used to write and revise text on any web page. Beyond spelling and grammar checking, we have seen an enormous shift in the ability of writing assistants from paraphrasing to auto-completion to content generation[2] in

[1] Examples of auto-complete systems: Apple iOS's predictive text, Microsoft Word's text predictions, Google Gmail's smart compose
[2] Examples of commercial tools for copy writing: Copy.ai, Copysmith, Jarvis; for creative writing: AI Dungeon, Sudowrite, Rytr, QuillBot, Writesonic

the past few years. Intelligent writing assistants have also been used to co-author multiple award-winning texts.[3]

In the First and Second Workshops on Intelligent and Interactive Writing Assistants [5, 7], diverse groups of academic scholars and industry practitioners from human-computer interaction (HCI) and natural language processing (NLP) communities came together to explore the current design space of writing assistants and the driving questions about how recent advances in the field of artificial intelligence (AI), particularly large language models [3, 4, 9] can fuel new interactions and processes for writing. The workshop community explored how we can support user goals and needs, choose backend language model(s) and their adaptation methods, the granularity of writing feedback (e.g., analyzing words, sentences, or entire documents), the way to handle potential failures from AI, and the display of suggestions to users (e.g., in-text highlighting vs. dashboard visualizations). This resulted in a collaboration among more than 30 researchers brought together by the workshop to characterize the design space of intelligent writing assistants and a full paper submission to CHI 2024 to share the outcomes from this work more broadly.

This work has paved the way for our community to ask a new set of equally essential questions: What are the potential *dark sides* or dangers of writing assistants? To guide our research towards desired futures and mitigate potential downsides, we must understand what we value and anticipate potential risks before they come to be. To do so, we must bring together diverse voices: writing research, HCI, NLP, professional writing practice, legal and labor studies, and education to share perspectives, experiences, and values for writing assistants.

Therefore, in our workshop at CHI 2024, the theme of the Third In2Writing Workshop will be **Dark Sides: Envisioning, Understanding, and Preventing Harmful Effects of Intelligent Writing Assistants**. Using group brainstorming, speculative design, and community building, we aim to facilitate discussion around the following questions:

- What are the ethical concerns and limitations of writing assistants, especially when leveraging AI?
- How will writing assistants change the way we write, either for the better or for the worse?
- How will writing assistants change the way we think, communicate, and make decisions?
- How will writing assistants impact our educational systems? Do they foster students' learning or hinder learning through automated assistance?
- What are our shared values and visions for writing assistants?
- What tensions or trade-offs arise between writing assistant benefits and downsides? How can we navigate these trade-offs with awareness of the diversity of needs and goals of users across contexts?

We believe our collective effort to answer these questions can provide researchers with a shared awareness of possible pitfalls and dangers as we build and evaluate ethical, beneficial human-centered writing assistants. Our objectives for this workshop are to:

Connect a diverse community of researchers across HCI, NLP, writing studies, and professional writing practice. To this end, we have alternated the organization of our workshop between HCI and NLP conferences and invited participants from writing studies and other domains to join our CHI workshop and connect to the HCI community. The Slack channel that was created from last year's In2Writing Workshop is an active and vibrant community and has already created one significant cross-institutional 30+ author research project. This workshop will continue to welcome new members into these spaces. We especially seek to reach out to participants new to HCI or to CHI to join in the conversation.

Create a shared archive of values, goals, and dark sides of writing assistants. The results of the workshop, including Miro boards and speculative designs, will be archived online and shared in the community Slack to provide an ongoing reference for researchers to revisit as they consider ethical questions and possible side effects of their systems. With the diverse participation in the workshop, this reference will help researchers think beyond their own perspectives.

Seed a community collaboration. Building on the success of last year's In2Writing collaboration, we will use the workshop results as a jumping-off point for creating a community collaboration on dark sides, concerns, and solutions for these issues in writing assistant research.

2 ORGANIZERS

Minsuk Chang (Google) is a research scientist on the PAIR (People and AI Research) team at Google Research. He explores novel computational interaction techniques powered by AI technologies by designing, building, and evaluating AI powered systems with users in the loop. Specifically, he is interested in 1) making large-scale pretrained models usable and useful, and 2) leveraging these pretrained models for simulating users and interfaces. He is also an adjunct professor at the KAIST Graduate School of AI.

John Joon Young Chung (Midjourney) is a research scientist on the Storytelling team at Midjourney. He envisions expanding the artifact-creation experiences by making it more accessible and introducing unprecedented creation interactions and media. With this goal, he studies, designs, implements and evaluates creativity support tools for art-making by leveraging AI/ML technologies, specifically in the domain of visual storytelling.

Katy Ilonka Gero (Harvard University) is a Postdoctoral Fellow at Harvard University. Her research focuses on designing and studying new paradigms for writing support using NLG, and how we can mitigate the problems associated with large models, like the generation of offensive language. She is on the organizing committee for the Workshop on Human-AI Co-Creation with Generative Models, held annually for the past three years at the Intelligent User Interfaces conference.[4]

Ting-Hao 'Kenneth' Huang (Pennsylvania State University) is an Assistant Professor at the College of Information Sciences and Technology (IST) of the Pennsylvania State University. His research lies in the intersection of HCI and NLP, imagining new possibilities

[3]Examples of texts co-authored with AI: Ghosts (Best American 2022 Selection), Nothing Breaks Like A.I. Heart (An essay about artificial intelligence, emotional intelligence, and finding an ending)

[4]https://hai-gen2021.github.io/

for human-AI collaborations. Dr. Huang explores the creative and complex domains, such as open conversation, writing support, and automatic storytelling, which seem exceptionally challenging to automate. His work aims to move automation beyond low-level, mundane tasks to augment human creativity and sociability.

Dongyeop Kang (University of Minnesota) is an Assistant Professor in the Computer Science Engineering department at the University of Minnesota, Twin Cities. He leads the Minnesota Natural Language Processing (NLP) group that aims to develop human-centered language technologies, focusing on developing interdisciplinary methods for NLP models and building interactive NLP systems for scientists and creative writers. He is co-organizing the Controllable Generative Modeling of Language and Vision (CtrlGen) workshop[5] at NeurIPS 2021.

Vipul Raheja (Grammarly) is an Applied Research Scientist at Grammarly. He works on developing robust and scalable approaches centered around improving the quality of written communication, leveraging Natural Language Processing and Machine Learning. His research interests lie at the intersection of text editing and controllable text generation.

Sarah Sterman (University of Illinois Urbana-Champaign) is a Research Assistant Professor in the Department of Computer Science at University of Illinois Urbana-Champaign (UIUC). Her research seeks to understand and support creative process by focusing on the underlying values that practitioners hold about how they work. In the domain of writing tools, she studies how machine learning can create unusual lenses for reading and writing, and how AI tools can be designed to enhance authentic expression and psychological ownership during the creative process.

Thiemo Wambsganss (Bern University of Applied Science) is a Research Assistant Professor and head of the Human-Centered AI-based Systems (HAIS) lab at Bern University of Applied Science in Switzerland. His work aims to leverage methods from Natural Language Processing and Machine Learning to provide users, in particular students, with intelligent writing feedback anytime and anywhere they want. In this vein, he strives to understand how humans perceive, interact, and learn with intelligent tools, such as argumentative writing support, empathic writing support, or conversational agents in general.

3 PLANS TO PUBLISH WORKSHOP PROCEEDING

The workshop information will be shared via the following website: https://in2writing.glitch.me/. Concretely, the call for participation, the program, the schedule, the organizers, the program committee, and the accepted papers will be published on the website. We will also apply to host workshop papers on the ACM Digital Library as proceedings.

4 HYBRID FORMAT AND ASYNCHRONOUS ENGAGEMENT

4.1 Mode of Organization: Hybrid Workshop

We are planning to organize a hybrid workshop, aiming to include both in-person and remote participants. This decision is driven by two primary objectives: (1) To foster broader engagement across multiple disciplines (*e.g.*, NLP, HCI, CSCW, etc.), and (2) to accommodate participants who might be hesitant to attend in person due to health, personal, or environmental concerns.

Our central communication and broadcast system during the synchronous workshop components will be Zoom. Last year's successful workshop resulted in a vibrant and ongoing Slack community; we will build on our existing Slack community to engage participants pre-, during, and post-workshop. We will ensure that the experience for in-person attendees aligns closely with that of remote participants, and at least one organizer will attend remotely. Based on the experience of last year's workshop, we are planning for 30-40 participants, with 2/3 in-person and 1/3 online (numbers are rough estimates that might deviate depending on this year's attendance).

To enable a vivid and fruitful interaction between online and offline participants, we are paying special attention to four measures in our workshop: (1) Both in-person and remote participants will have the opportunity to present lightning talks. We will have an in-room microphone, camera, and speaker system to make sure both in-person and remote participants can see and hear each other. (2) During small-group discussions, participants will be grouped based on their attendance mode (in-person or remote) to ensure smooth in-group communication. When the groups reconvene, we will ensure that all small groups present their findings to the full workshop, akin to the lightning talk format. One of the organizers attending in person will be tasked to monitor the questions in the online Zoom chat to ensure the remote participants can be heard seamlessly. (3) We will promote the use of online platforms like Miro Board (https://miro.com/) and/or Google Docs to enable live feedback, brainstorming, and discussions in our session ensuring accessibility for all participants whether remote or in-person. This will not only have the benefit of documenting the different outcomes of the workshop, but will also help to build connections between remote and in-person attendees. (4) All Zoom communications will be transcribed in real-time using an AI transcriber to enhance accessibility.

4.2 Asynchronous Engagement

In light of the challenges associated with real-time participation, we are dedicated to offering asynchronous engagement avenues. All accepted papers will be uploaded to the workshop website and thus made widely accessible for research and practice. Furthermore, subject to the presenter's approval, we will disseminate recordings of the lightning talks, as well as their transcripts generated by Zoom. Moreover, the outcomes of our group discussions will be made public in the form of blog posts. We will invite all accepted participants to our existing community Slack channel for pre- and post-workshop asynchronous discussions. Importantly, we will instruct and remind all authors to comply with the *Guide to accessible submission*.[6] This ensures that all workshop outputs, such as accepted papers, are rendered accessible prior to their public release.

[5] https://ctrlgenworkshop.github.io/

[6] https://sigchi.org/conferences/author-resources/accessibility-guide/

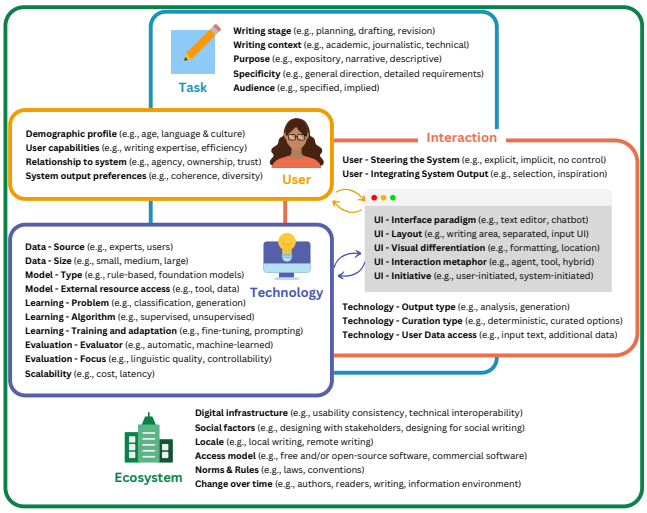

Figure 1: Design space for intelligent and interactive writing assistants (paper currently under review). This design space was developed from the outputs and community of the Second Workshop on Intelligent and Interactive Writing Assistants (CHI 23). In this year's workshop, we will build off this design space to characterize challenges and possible pitfalls of intelligent writing assistants.

5 WORKSHOP ACTIVITIES

Our workshop will consist of two parts. **Community building**: In the first part, participants will share 2-minute lightning talks to introduce the range of expertise and interests within the workshop community. A panel of experts will kick off the theme of the workshop by discussing the dark sides and challenges of writing tools they have uncovered in research or practice. **Dark sides**: In the second part, we will build from the design space created by the 2023 In2Writing Workshop (Figure 1) to explore dark sides and challenges of intelligent writing tools. Participants will identify design patterns and technical choices of existing tools, then engage in a speculative design activity to surface concerns and challenges the community will have to grapple with to create ethical, value-aligned intelligent writing tools in the future.

5.1 Part 1: Community Building

The intelligent writing tools community covers a broad range of writing domains, users, and process goals. One key goal of the workshop is to connect this diverse community to each other and share the breadth of our knowledge. The morning will begin with a general introduction to objectives, organizers, participants, and schedule, followed by a quick icebreaker to set the collaborative tone. This will be followed by 2-minute lightning talks from each position paper's authors. We have found this rapid format successful for introducing a wide group of participants while keeping the energy high. To introduce the theme of the workshop, a panel of experts in research and writing practice will discuss dark sides and challenges of writing tools they have uncovered in research or practice.

5.2 Part 2: Discuss Dark Sides and Challenges of Intelligent Writing Assistants

In the afternoon, we will dig into the theme of dark sides of writing tools. Leveraging the design space created after the Second Workshop on Intelligent and Interactive Writing Assistants in 2023 (Figure 1), participants will brainstorm a range of design patterns and technical choices in existing writing tools that have the potential to create or reveal dark sides of writing tools. This brainstorming will take place on an online platform such as Miro to connect both in-person and virtual participants in a shared space. Coming together into the full group, small groups will briefly present the most interesting design patterns in their cluster. Participants will indicate which ideas they are interested in pursuing using dot-voting on the online platform. After a short break, participants will re-organize around design patterns of interest. In small groups, participants will perform a speculative design activity exploring the dark sides of the design patterns. By engaging in critical speculative design, we will be able to go beyond current issues to think about what challenges will face our communities in the near (or distant) future, and surface core values around what we do and don't want our writing tools to be. We will wrap up with a full group discussion of the speculative designs, as well as potential ways we as a research community might respond to or prevent such dark sides. Finally, organizers will wrap up the workshop, presenting the summary of the workshop and plans for the post-workshop. The workshop will end with taking a group photo with all organizers and participants.

6 POST-WORKSHOP PLANS

All workshop participants will be invited and welcome to participate in the post-workshop activities and planning, composed of the following three main parts.

- **Disseminate the results of the workshop.** The accepted papers, videos, slides, discussion results, and releasable materials will be published on our website (https://in2writing.glitch.me/). Some of these materials can be put on the website before the workshop (e.g., accepted papers), and other materials will be uploaded after the workshop.
- **Keep the conversation going.** We will arrange an in-person networking event (e.g., dinner or social gathering) immediately after the workshop to continue the conversation. Additionally, we encourage participants and organizers to participate in a post-workshop discussion. The Slack community created as part of our last In2Writing workshop now has over 70 participants, and resulted in a follow-up paper (currently under review) based on the discussions at the workshop and in Slack. We will build off this community success, and continue to use and grow the vibrant Slack channel for asynchronous post-workshop discussions and future collaborations.
- **Crystallize the thoughts and discussions.** One of the key activities of our workshop is to invite all the participants to collectively understand, envision, and prevent the dark sides or challenges of intelligent writing assistants. After the workshop, we will apply for a special issue in TOCHI to expand the concepts and directions explored in the workshop. We will also invite all the interested participants to

Table 1: Proposed workshop schedule.

	Duration	Activity
Morning	09:00-09:20	**Welcome**: Introduce objectives, organizers, participants, and schedule, along with an icebreaker.
	09:20-10:50	**Lightning Talks**: 2-minute lightning talks by each set of position paper authors
	10:50-11:00	*Short break.*
	11:00-12:00	**Panel**: Discussion on *dark sides* by invited panel.
	12:00-13:30	*Lunch break.*
Afternoon	13:30-14:15	**Identify Design Patterns**: Using the design framework for intelligent writing assistants, small groups organize around components of the design space and identify design patterns or technical choices of existing tools.
	14:15-14:30	**Share Design Patterns**: Collect and share design patterns; participants use dot voting to indicate areas of interest.
	14:30-14:45	*Short break.*
	14:45-15:45	**Speculative Design Activity**: Form new small groups around a specific design pattern. Groups perform a speculative design activity exploring the dark sides or challenges of the design pattern.
	15:45-16:00	*Short break.*
	16:00-16:45	**Discussion**: Small groups present their speculative designs to the full group, and discuss consequence, effects, and possible responses by the research community.
	16:45-17:00	**Wrap up**: summarize the workshop, plans for post workshops, and take group photos.

co-write a paper based on the speculative design activity at the workshop, which will extend and deepen the ways the research community might address dark sides.

7 CALL FOR PARTICIPATION

Writing assistants have become increasingly ubiquitous, and these tools are changing the way we write. In our workshop at CHI 2024, our theme is **Dark Sides: Envisioning, Understanding, and Preventing Harmful Effects of Intelligent Writing Assistants**. At the workshop, a diverse group of researchers and practitioners interested in writing assistants will perform group brainstorming, speculative design, and community building to explore this theme.

To attend this hybrid event, we ask participants to write a 2-page position paper on their perspectives on writing assistants, potentially responding to one of the following prompts:

- What are ethical concerns and limitations of writing assistants, especially regarding AI?
- How will writing assistants change the way we write, for better or for worse?
- How will writing assistants change the way we think, communicate, and make decisions?
- What are our shared values and visions for writing assistants?
- How can we navigate tensions and trade-offs arise between writing assistant benefits and downsides?

We invite submissions from HCI and NLP researchers, writers, educators, industry practitioners, students, and anyone interested in creating, using, and testing future writing technologies. Participants will be invited based on demonstrating in-depth thinking about writing assistants. Invited papers will be hosted on the workshop website. If you have any questions or concerns, please contact the organizers.

Submissions should follow CHI publication formats[7] and will go through a double-blind peer review.

Paper submission deadline: February 13, 2024 (11:59 PM AOE)

Paper acceptance notification and submission system: TBA on the website (https://in2writing.glitch.me/).

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