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AI as a Force for Good: Promoting Diversity and Inclusion in Tech

Short Paper

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Abstract

This study investigates the role of Generative Artificial Intelligence (GenAI) in software development training, particularly for minorities and disadvantaged individuals. While software development is a crucial driver of the digital economy, the technology sector suffers from a lack of diversity. By examining the discourse and emerging practices surrounding the use of GenAI, such as ChatGPT and GitHub Copilot, the research examines how these technologies can empower learners and bridge the diversity gap in technology workforce. Through a multi-method approach involving data collection from Reddit and interviews, the study uncovers insights into the role of AI in training individuals for programming careers. Preliminary findings of our topic modelling reveal the potential of AI to provide personalised instruction, thereby promoting inclusivity and empowering underrepresented groups. The study contributes to understanding the dynamics of AI empowerment in software development training and offers practical recommendations for fostering diversity and inclusion within the technology industry.

Keywords: Artificial Intelligence, GenAI, software programming, inclusion, empowerment, learning

Introduction

The underrepresentation of women, ethnic minorities, and other disadvantaged groups within the technology sector is a persistent and multifaceted challenge. In the UK, the technology industry faces a stark lack of diversity, with only 15% of the workforce coming from Black, Asian, and Minority Ethnic (BAME) backgrounds, and gender diversity lagging at 19% compared to the national average of 49% across all professions¹. This disparity is mirrored on a global scale, as a recent study by Capgemini (2021) revealed that women and ethnic minorities comprise merely 20% and 17% of IT/tech employees, respectively. In addition, the participation of women in tech-related fields has actually decreased by 32% since 1990, despite ongoing efforts to enhance inclusion (Avni and el Kaliouby 2020).

This study aims to examine the potential of new artificial intelligence (AI) technologies in addressing this pressing issue. Specifically, it seeks to explore the role of AI in the training and development of software programming skills among minority and disadvantaged populations. By leveraging the capabilities of AI, this research endeavors to uncover innovative pathways that can bridge the persistent gender and diversity gaps within the technology industry.

The software development industry serves as the indispensable foundation of the digital economy, providing the underlying infrastructure that powers a myriad of products and services with pervasive

¹ <https://www.diversityintech.co.uk>

applications across both commercial and consumer domains. The global software market is expected to reach an estimated \$698.80 billion by 2024 and a substantial \$858.05 billion by 2028 (1). This upward trajectory reflects the pivotal role of software development in driving technological innovations that transform diverse industries, from autonomous driving algorithms in the automotive sector to actuarial modelling software in insurance, telemedicine platforms in healthcare, and algorithmic trading systems in finance. As the digital landscape continues to rapidly evolve, the software development industry has become a bedrock of the modern economy, serving as the digital infrastructure that enables groundbreaking innovations across traditional and emerging sectors. Consequently, the demographic composition and inclusive practices within this industry hold profound implications for the equitable distribution of the benefits and opportunities presented by technological advancements.

The transformative potential of Generative Artificial Intelligence (GenAI) tools, such as ChatGPT and Gemini, as well as specialised AI applications like GitHub Copilot and AlphaCode, is poised to reshape the very foundations of software development (Kalliamvakou 2024). These advanced AI technologies are redefining the role of programmers, transitioning them from task execution to strategic problem-solving and creative ideation. By automating repetitive processes like code generation and error identification, GenAI streamlines development workflows, freeing up valuable time and cognitive resources for developers to tackle complex challenges and explore innovative solutions (Kalliamvakou 2024).

Beyond mere automation, these AI-powered tools possess the capacity to enhance creativity and foster unprecedented technological breakthroughs within the software industry. GenAI can generate alternative code solutions, suggest novel functionalities, and uncover unconventional possibilities that may have evaded human programmers. This ability to expand the realm of the imaginable can potentially catalyse the development of more efficient, elegant, and more innovative software solutions. As the software development landscape continues to evolve in the face of these AI-driven transformations, understanding the implications for inclusion and diversity within this critical sector becomes increasingly vital.

With such capabilities, AI has the potential to foster creativity and skill development of human programmers as the demand for software development jobs might continue to grow (Willcocks 2020). This offers opportunities to empower minorities and disadvantaged individuals to gain the skills and expertise in software programming and enable their careers in the less diverse tech sector. Fostering diversity within the tech sector would foster the creation of more inclusive tech design solutions (Capgemini 2021; Crowell 2023). In this regard, our study aims to understand how GenAI can be embedded in software programming training to empower minorities and disadvantaged individuals in gaining the skills for a career in tech. To achieve this, we address the following questions:

- What is the current discourse and emerging practices around the use of GenAI for learning programming?
- How GenAI is effective in supporting learners to build an accurate mental model of how a program executes?
- How AI can be used to empower minorities and disadvantaged people in learning programming?

Research Background

Scholarship on AI's impact on employment suggests that emerging AI technologies complement rather than replace human creativity, with automation and augmentation being mutually reinforcing (Raisch and Krakowski 2020). Initial research by Frey and Osborne (2017) sparked debates about potential job losses due to automation, especially in fields involving repetitive tasks across diverse industries. This viewpoint, however, has been challenged by researchers like McAfee and Brynjolfsson (2017), who contend that AI is likely to generate novel employment opportunities while substantially transforming existing roles. Willcocks (2020) argues that these technologies will enhance human capabilities rather than render them obsolete. While new positions will emerge in areas such as technology design, development, implementation, and management, the skill requirements for many jobs will shift, but human aptitudes will remain highly valued. Davenport and Miller (2022) introduce the concept of "augmented intelligence," where AI enhances and complements human abilities. This synergistic approach has the potential to yield significant productivity improvements and stimulate innovation. This perspective aligns with the expanding field of Human-AI Collaboration research (Puranam 2021), which investigates how humans and AI can work symbiotically to achieve optimal outcomes.

Recent research indicates that while AI can enhance human capabilities like creativity (Jia et al. 2024), it may also contribute to skill degradation in the realm of cognitive automation (Rinta-Kahila et al. 2023). Rinta-Kahila et al. (2023) argue that when sophisticated intelligent systems can execute knowledge-intensive tasks, organisations may experience a decline in skills, leading to an overreliance on automation. This dependency can result in the mindless execution of tasks without a comprehensive understanding of the processes involved. The issue of worker accountability for tasks they don't fully grasp creates a significant vulnerability; should the automated system fail, they might not be fully equipped to rectify the situation. Other studies also refer to dynamics of task completion capabilities and skill changes. Researchers have noted that AI systems can empower less qualified employees to undertake tasks beyond their typical competencies, while simultaneously deskilling highly qualified workers, potentially reducing the level of expertise required for their positions (Strich et al. 2021).

The paradoxical role of AI in transformation of knowledge workers' jobs and skills necessitates a workforce equipped with the skills to adapt and thrive in this new and dynamically evolving environment. While certain routine tasks may become automated, the demand for highly skilled professionals, such as software developers and data scientists, is expected to increase. This emphasises the critical importance of reskilling and upskilling programs to address the gap between the current workforce capabilities and the requirements of an AI-driven future. For instance, comparisons between human-generated and Copilot-generated code revealed that Copilot can serve as a valuable tool when utilised by experienced developers but may pose challenges for novices. This is because their limited expertise might impair their ability to effectively identify and eliminate Copilot's flawed or suboptimal solutions (Moradi Dakhel et al. 2023). Research by Eshraghian et al. (2024) further indicated that experienced programmers exhibit more positive attitudes towards Copilot, perceiving it as a means to enhance their skills and potentially expand their professional identity. This presents a significant opportunity to address the diversity issues in the tech sector, which have been described as 'disastrous' and 'alarming.' These concerns extend beyond the operations of tech/AI companies, influencing the types of products designed and developed, as well as who benefits from their advancement (Myers-West et al. 2019).

The studies indicate that software programmers need to possess a strong understanding of fundamental programming concepts and skills to effectively utilise these tools and translate AI suggestions into real-world applications. Nevertheless, concerns persist regarding excessive reliance on AI, particularly among novice developers who may become overly dependent on these technologies. Given the increasing reliance of economies and societies on software, there is a strategic imperative to expand educational opportunities that foster a larger pool of skilled developers (Dohmke et al. 2023). However, there is a paucity of research on how educational institutions and training organisations can adapt their curricula for the era of Generative AI to equip individuals with the skills necessary to navigate this evolving job market. This situation presents a twofold opportunity: on one hand, it offers individuals the chance to acquire the skills needed to participate in this dynamic industry; on the other, a diverse and inclusive tech sector workforce can contribute to the development of more inclusive technological solutions (Capgemini 2021).

The incorporation of AI into software development training presents significant opportunities, particularly for non-profit organisations dedicated to preparing minorities and disadvantaged individuals for careers in the tech sector, thus helping to address the industry's diversity gap. AI-powered tools can provide real-time feedback on coding exercises, enabling trainees to promptly correct errors and reinforce their understanding of the material. By utilising AI visualisation technologies, learners can develop a dynamic comprehension of how code translates into tangible program actions. This visual approach enhances their grasp of the complex interplay between code and program behaviour.

Furthermore, AI can facilitate trainees in developing more precise mental models of program execution. In software development, constructing mental models of program runtime is crucial for comprehending code behavior during execution. These mental models involve adhering to a set of fixed rules (runtime execution rules) that govern program execution. The immutable nature of these runtime environment rules entirely determines a program's behavior. This deterministic aspect makes it considerably easier to accurately assess how well a trainee has internalised these rules: evaluators can pose highly specific questions to probe the trainee's underlying mental model. Initially, this process may be time-consuming as learners methodically analyse a program line-by-line to understand its behavior. However, through consistent and deliberate practice, learners can comprehend these rules and construct a functional mental model of program execution. Trainees without prior programming experience must rely directly on their newly

formed mental model to address such questions. Consequently, this learning domain is particularly effective for directly assessing how accurately trainees have constructed their mental models.

Theoretical Lens

The concept of empowerment is widely used in Information and Communication Technologies for Development (ICT4D) research to discuss the positive social and economic impacts of technology for individuals in less developed and disadvantaged contexts. However, the term empowerment itself has become a buzzword to highlight the positive impacts of technologies and does not fully capture the complexities of how technology can influence positive change (Pandey and Zheng 2023). For instance, one study showed that rural farmers in Ghana use mobile phones to get information on improving their crops (Kwapong 2009). In another study, Nguyen et al. (2017) investigated how Vietnamese foreign brides in Singapore leverage mobile phones for empowerment within the intersection of gender, class, and ethnicity to gain skills in settling into their new life in Singapore.

However, empowerment is not always straightforward, but it is a multi-faceted concept. There can be barriers that prevent people from using technology effectively, and even when they do use it, the results may not always be what they expected. A more helpful way to view empowerment in ICT4D research is to focus on how technology can enable people achieve what they find valuable and make changes in their social realities. This could mean giving them more freedom to make choices, improving their access to information, or helping them build new skills. Díaz Andrade and Doolin (2016) utilise the capability approach to demonstrate how information and communication technology (ICT) contributes to refugees' agency and well-being, enabling greater participation in society and increased control over their lives. Despite the valuable insights, the literature lacks a unified definition of the concept, and it can be viewed both as the process and the outcome.

This is of significance within the context of the new AI tools and their application in the specialised, knowledge work such as software programming. As these technologies have the potential to empower minorities and disadvantaged individuals in gaining programming skills, while they can also act paradoxically and bring about more disadvantage due to automation of more routine activities and making their role redundant. Therefore, by applying the concept of empowerment, we unravel the dynamics of how AI can empower these individuals within the power dynamics of software development profession.

Research Method

In order to address the research questions, we utilise a multi-method research design. By using both methods, we can validate our findings from multiple angles strengthening the overall credibility and trustworthiness of our research. The multi-method research design for this study has two phases: first to provide broader overview of the online discourse on and prevalent practices in using AI in learning how to code (mainly in addressing the first research question), and second to present an in-depth understanding of AI's application in training minorities for coding (in addressing the second and third questions).

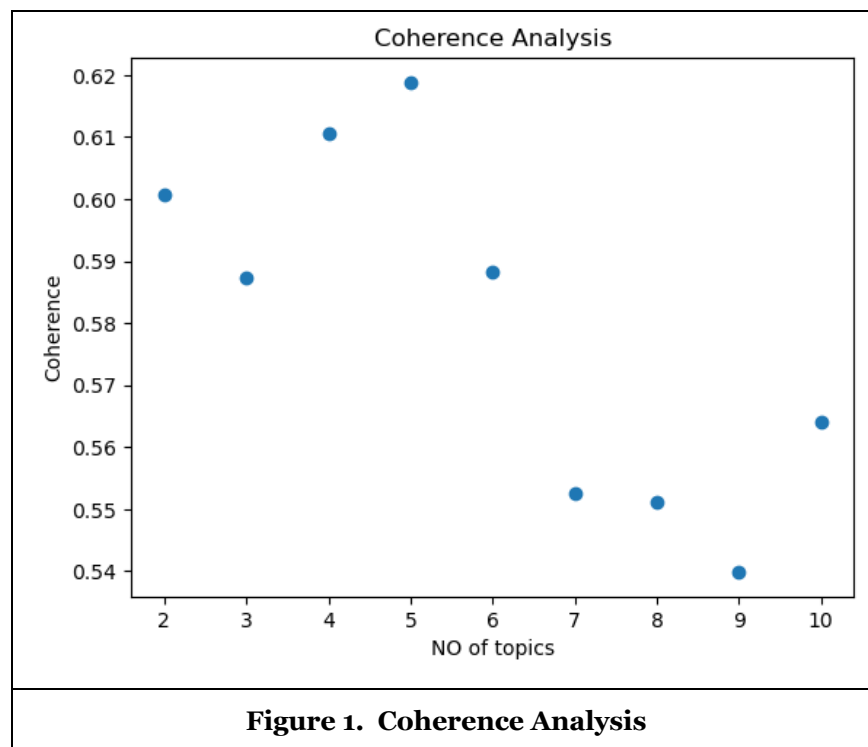
The first phase included gathering data of comments regarding the use “AI in code learning” on Reddit. Reddit is one of the most popular platforms that software programmers use extensively to share opinions and exchange ideas about different aspects of software and coding and it organises discussions based on their topics into different communities called subreddits (Burtch et al. 2022). Two popular communities (i.e., subreddits) are “r/programming”² and “r/learnprogramming” which rank in the top 1% and have 6.1 and 4.1 million subscribers, respectively. There are a significant number of discussions on this platform regarding the use of AI in the process of ‘learning how to code’ such as “What is the best AI to learn coding?”, “Asking AI or Googling?”, “You can use ChatGPT to train yourself” among others. Since the idea of using AI to learn programming is in its nascency, in the first phase of our data collection, we collected comments relevant to this topic from pertinent Reddit communities such as “r/learningprogramming”. As an initial exploration on Reddit indicated a likely volume of relevant comments exceeding several thousands, we automated this part of the data collection using Reddit API and Python. The keywords of “ChatGPT”, “LlaMA”, “Claude” and “Gemini” in the community of “r/learningprogramming” and the keyword of “learn programming” in the communities of “r/ChatGPT”, “r/ClaudeAI”, “r/GPT3”, “r/LocalLLaMA”, “r/Gemini”

² Communities or subreddits are addressed as follows on Reddit: r/[the name of the subreddit]

and “r/ChatGPTPro” on Reddit were used in this process and at the end of this data collection phase, 15121 comments were collected from Reddit (from 6/12/2022 to 02/09/2024).

In order to review the online discourse on using AI in learning how to code, we applied topic modelling, a text mining technique, to the collected data in this phase. Topic modelling is an approach which is well recognised for its data-driven nature and computational intensity in finding insights and patterns (Hannigan et al. 2019). This method, akin to grounded theory approach (Berente et al. 2019), elucidates patterns and uncovers relationships within data by leveraging established terminologies and concepts. By employing topic modelling, a statistical technique grounded in machine learning, we aimed to unveil hidden themes and conceptual relationships within the textual data (i.e., the collected Reddit comments), many of which might have even been latent to the researchers of this study. Given the size of the Reddit comment corpus (10536), topic modelling presented itself as a well-suited method for uncovering the central themes embedded within these comments.

For this purpose, we utilised the Latent Dirichlet Allocation (LDA) technique, a probabilistic model renowned for its ability to categorise text and elucidate similarities within data segments without relying on predefined keywords. This approach allowed us to extract meaningful themes, which would have been significantly time consuming for qualitative methods such as grounded theory. Essentially, LDA posits that text consists of a random mixture of latent topics, each characterised by specific words distributed throughout the text (Blei et al. 2003). To choose the number of topics, we used coherence and perplexity measures to determine the optimal number of topics in our dataset of the Reddit comments. (Azzopardi et al. 2003). The measure confirmed that four topics (as shown in Figure 1) would be the best number for this categorisation.



Next stage of data collection and analysis

To address the second and third research questions, in the second phase of data collection, we will gather qualitative data from social enterprises with the mission to train women and disadvantaged people to become software developers and help them start careers in the tech industry. In this phase, the methods of data collection are interviews and observations. Firstly, we will interview instructors (and potentially trainees) from such organisations in order to explore why and how they are utilising AI in their code training, how AI might help their trainees develop a mental model to understand how codes are run by

computers, and finally what their expectations are with regard to their trainees working with AI when they start programming software professionally.

In addition to interviews, this study intends to observe the training sessions of these non-profit organisations while using AI in their learning process and developing their mental models. The logs and records of their use of AI-powered platforms will be the main source of data in this stage. By conducting interviews with instructors and potential trainees from social enterprises dedicated to training underrepresented groups in software development, the study aims to gather rich, in-depth insights into the practical application and impact of AI in coding education. These interviews, complemented by observations, will provide valuable data on the use of AI in code training, its role in developing learners' mental models of program execution, and its potential for empowering disadvantaged individuals in the tech industry. This approach ensures that the methods employed are tailored to capture the nuanced experiences and perspectives necessary to comprehensively address the research questions at hand.

The transcripts of our interviews and records of our observations are going to be coded qualitatively using grounded theory approach (Glaser and Strauss 1999). Through an iterative coding process, themes and categories will emerge from the data to uncover the nature of AI use and effectiveness in training how to code. NVivo 14 will be the main tool for our analysis in this phase.

Preliminary Findings

Our topic modelling revealed five topics (categorised through five sets of keywords). We then analysed the results of the topic modelling by examining comments within each of the five categories and cross-referencing them with the associated keywords. This iterative process was carried out collaboratively by the first and second authors, resulting in the identification of the topic labels presented in Table 1. Additionally, 574 comments, comprising 3.80% of the corpus, were deemed irrelevant to any of the identified topics by the algorithm.

Topic	Keywords (with different weights in the word vector of the topic)	Labelling topics	% of comment corpus
Topic 1	Like, code, think, know, learn, time, thing, program, work, ChatGPT	The Future of Coding Literacy: Programming as an Essential Skill in the AI Era	36.55%
Topic 2	https, reddit, comment, ChatGPT, message, post, prompt, change, question, delete	N/A	12.59%
Topic 3	learn, code, write, like, game, work, project, program, think, problem	Leveraging Custom AI Agents for Game Development: Streamlining Collaboration Between Design and Programming	23.40%
Topic 4	work, like, good, prompt, think, model, people, generating, answer, know	The Impact of Rapidly Evolving AI on Software Development: Learning, Adaptation, and Future Implications	23.58%
Topic 5	model, thank, like, llama, data, look, need, train, work	Navigating AI Integration in Enterprise Software Development: Balancing Innovation and IP Protection	19.09%

Table 1. The Outcome of Topic Modelling and Labelling Topics

Topic one emphasises on how programming skills may become increasingly crucial in a world where AI and software are ubiquitous, and why understanding code might be essential for thriving in future societies. Without the knowledge of coding, using AI might not be of significant help. In order to show the importance of coding knowledge, it draws a parallel between coding literacy and traditional literacy. The idea of coding becomes a fundamental skill, similar to reading or speaking languages, as suggested in the following comment:

"programming will be as much of a basic skill as learning to read or speak other languages. Just like you need to understand the text yourself with reading, you will also need to understand what the AI has output as code and why. And reading code will become more of a necessity for people as AI and software begins to permeate everything we do. Not knowing how to code today is similar to not being able to read in 1700... you can live 50 working years of you're [sic] life and the importance of reading won't change dramatically between 1700 to 1750. But with coding look at how important it became between 1950 to 2000. That's one hell of an exponential curve, and it's only getting steeper. You do not want to be code illiterate as technology continues to completely flip the script on how society functions."

Topic two consists of comments which were merely instructions posted by bots based on pre-configured templates such as "... *I am a bot, and this action was performed automatically. Please [contact the moderators of this subreddit]". Therefore, we removed this topic from our analysis.

Topic three highlights how developers can create and utilise custom AI tools to enhance their workflow, particularly in game development. It also touches on the broader implications of using specialised AI assistants in creative and technical projects. It could explore the benefits and challenges of this approach, how it might evolve in the future, and its potential impact on the game development industry and similar creative fields:

"I barely use GPT's from the store but create my own GPT's for personal use. For example I'm developing a mobile game at the moment and I have a Game Designer GPT, and a Developer GPT, both have a knowledge base specific to the game and their task, both have a copy of the MVP, the game designer has a copy of the GDD, and the Developer GPT has a copy of the codebase. So as you see they're very tailored and customised to my needs. Until now I kept sending messages between them, the game designer was tasked to give tasks to the developer, and the developer was supposed to raise questions about the design (like refinement) which I copied between chats."

Topic four explores the benefits and challenges of integrating AI into software development workflows, the potential long-term effects on the industry, and how developers can best prepare for and adapt to these changes. The topic refers to rapid improvement of AI models like ChatGPT and how developers are using AI tools to enhance their skills and workflow. In addition, it touches on the potential disruptions to the tech labour market and its broader implications for people in the tech industry:

"ChatGPT is also improving exponentially. A lot of the best thinkers in AI feel that this may create serious labor force disruptions in tech. Not today, but sooner than people think"

This topic also points out the learning opportunity provided for developers by this exponential improvement in AI models such as the comparison between human-generated and AI-generated code solutions:

"I've been using it to compare my answers from CodeWars to what it generates and then also to top answers and see how I can improve, try to get the GTP answer to improve and learn all that stuff"

Topic five notes the practical considerations of using AI in enterprise software development, the potential impacts on workflow and productivity, and the broader implications for the future of the tech industry. It lists the benefits and challenges of integrating AI tools like ChatGPT into enterprise software development workflows and stresses the importance of understanding AI training processes and data usage in relation to company IP:

"Recently we received word that we are allowed to generally use enterprise ChatGPT on our products (as it doesn't use our repos for training), however there's still certain core IP repos that we're not allowed to use it for"

The topic also highlights the data and training aspects of AI models when it comes to enterprise settings and companies' data.

Conclusion, Expected Contributions, and Next Steps

The present study holds the potential to make significant contributions by unravelling the dynamics of AI-powered empowerment within software development training. In doing so, it aims to deepen our understanding of how to effectively harness the transformative potential of AI in fostering a more inclusive workforce within the technology sector. The insights gained from this research will offer invaluable knowledge for a diverse array of stakeholders driving change in the tech industry. For researchers, this study will provide crucial insights into the interplay between AI capabilities and the goal of promoting diversity and inclusion in technology-related professions. These findings can inform future investigations and shape the research agenda in this emerging interdisciplinary field.

With respect to policy making, the research outcomes can guide the development of initiatives and programs that strategically leverage AI tools to enable minorities and disadvantaged individuals to acquire the necessary skills and enter the technology workforce. By informing evidence-based policymaking, this study can contribute to the creation of a more equitable and representative technology sector. For social enterprises and organisations committed to empowering underrepresented groups, the practical recommendations stemming from this research can inform the effective integration of AI-powered solutions to optimise their impact and expand access to technology-driven career pathways. These insights can help such entities navigate the complexities of AI implementation and harness its capabilities to drive meaningful and sustainable change.

In the next phase of this research, the team plan to continue gathering and analysing data from Reddit and start collecting data from social enterprises through in-depth interviews mainly. The analysis of this qualitative data will inform the initial findings, which the team aim to present at the ICIS conference in December 2024. Through this multifaceted approach, the study will continue to explore the nuances and potential of AI-driven interventions in bridging the diversity gap in the technology industry.

References

- Andrade, A. D., and Doolin, B. 2016. "Information and Communication Technology and the Social Inclusion of Refugees," *MIS Quarterly* (40:2), pp. 405–416.
- Avni, R., and el Kaliouby, R. 2020. "Here's Why AI Needs a More Diverse Workforce," *World Economic Forum*. (<https://www.weforum.org/agenda/2020/09/ai-needs-diverse-workforce/>, accessed April 29, 2023).
- Azzopardi, L., Girolami, M., and Van Risjbergen, K. 2003. "Investigating the Relationship between Language Model Perplexity and IR Precision-Recall Measures," in *Proceedings of the 26th Annual International ACM SIGIR Conference on Research and Development in Informaion Retrieval*, pp. 369–370.
- Berente, N., Seidel, S., and Safadi, H. 2019. "Data-Driven Computationally Intensive Theory Development," *Information Systems Research* (30:1), pp. 50–64. (<https://doi.org/10.1287/isre.2018.0774>).
- Blei, D. M., Ng, A. Y., and Jordan, M. I. 2003. "Latent Dirichlet Allocation," *Journal of Machine Learning Research* (3:Jan), pp. 993–1022.
- Burch, G., He, Q., Hong, Y., and Lee, D. 2022. "How Do Peer Awards Motivate Creative Content? Experimental Evidence from Reddit," *Management Science* (68:5), INFORMS, pp. 3488–3506.
- Capgemini. 2021. "The Key to Designing Inclusive Tech: Creating Diverse and Inclusive Teams."
- Crowell, R. 2023. "Why AI's Diversity Crisis Matters, and How to Tackle It," *Nature*, pp. 1–12.
- Davenport, T. H., and Miller, S. M. 2022. *Working with AI: Real Stories of Human-Machine Collaboration*, MIT Press.
- Dohmke, T., Iansiti, M., and Richards, G. 2023. "Sea Change in Software Development : Economic and Productivity Analysis of the AI-Powered Developer Lifecycle," *Arxiv*.

- Eshraghian, F., Hafezieh, N., Farivar, F., and de Cesare, S. 2024. "AI in Software Programming: Understanding Emotional Responses to GitHub Copilot," *Information Technology and People*.
- Frey, C. B., and Osborne, M. A. 2017. "The Future of Employment: How Susceptible Are Jobs to Computerisation?," *Technological Forecasting and Social Change* (114), Elsevier B.V., pp. 254–280. (<https://doi.org/10.1016/j.techfore.2016.08.019>).
- Glaser, B. G., and Strauss, A. L. 1999. *Discovery of Grounded Theory: Strategies for Qualitative Research*, New York: Routledge.
- Hannigan, T. R., Haans, R. F. J., Vakili, K., Tchalian, H., Glaser, V. L., Wang, M., Kaplan, S., and Jennings, P. D. 2019. "Topic Modeling in Management Research," *Academy of Management Annals* (13:2), pp. 586–632.
- Jia, N., Luo, X., Fang, Z., and Liao, C. 2024. "When and How Artificial Intelligence Augments Employee Creativity," *Academy of Management Journal* (67:1), pp. 5–32. (<https://doi.org/0426>).
- Kalliamvakou, E. 2024. "A Developer's Second Brain: Reducing Complexity through Partnership with AI," *GitHub*. (<https://github.blog/2024-01-17-a-developers-second-brain-reducing-complexity-through-partnership-with-ai/>, accessed February 6, 2023).
- Kwapong, O. A. T. F. 2009. "An Empirical Study of Information and Communication Technology for Empowerment of Rural Women in Ghana," *African Journal of Information & Communication Technology* (4:3), pp. 80–86.
- McAfee, A., and Brynjolfsson, E. 2017. *Machine, Platform, Crowd: Harnessing Our Digital Future*, WW Norton & Company.
- Moradi Dakhel, A., Majdinasab, V., Nikanjam, A., Khomh, F., Desmarais, M. C., and Jiang, Z. M. (Jack). 2023. "GitHub Copilot AI Pair Programmer: Asset or Liability?," *Journal of Systems and Software* (203).
- Myers-West, S., Whittaker, M., and Crawford, K. 2019. "Discriminating Systems: Gender, Race, and Power in AI," *AI Now Institute*. (<https://ainowinstitute.org/discriminatingystems.pdf>).
- Nguyen, H., Chib, A., and Mahalingam, R. 2017. "Mobile Phones and Gender Empowerment: Negotiating the Essentialist-Aspirational Dialectic," *Information Technologies & International Development* (13), pp. 181–185.
- Pandey, P., and Zheng, Y. 2023. "Technologies of Power in Digital Inclusion," *Journal of the Association for Information Systems* (24:5), pp. 1334–1357.
- Puranam, P. 2021. "Human–AI Collaborative Decision-Making as an Organization Design Problem," *Journal of Organization Design* (10:2), Springer, pp. 75–80.
- Raisch, S., and Krakowski, S. 2020. "Artificial Intelligence and Management: The Automation-Augmentation Paradox," *Academy of Management Review*, pp. 1–48.
- Rinta-Kahila, T., Penttinen, E., Salovaara, A., Soliman, W., and Ruissalo, J. 2023. "The Vicious Circles of Skill Erosion: A Case Study of Cognitive Automation," *Journal of the Association for Information Systems* (24:5), pp. 1378–1412.
- Strich, F., Mayer, A. S., and Fiedler, M. 2021. "What Do I Do in a World of Artificial Intelligence? Investigating the Impact of Substitutive Decision-Making AI Systems on Employees' Professional Role Identity," *Journal of the Association for Information Systems* (22:2), pp. 304–324.
- Willcocks, L. 2020. "Robo-Apocalypse Cancelled? Reframing the Automation and Future of Work Debate," *Journal of Information Technology* (35:4), pp. 286–302.