

# Generative Design and Vibe Coding: Rethinking The Design-Development Divide for UI Prototyping

Xinqi Zhang  
Santa Clara University  
USA  
xzhang22@scu.edu

Hari Subramonyam  
Stanford University  
Stanford, USA  
hari@stanford.edu

Advait Sarkar  
University of Cambridge, University  
College London, Microsoft Research  
United Kingdom  
advait@microsoft.com

Ian Drosos  
Trent AI  
United Kingdom  
ian@trent.ai

Jack Wang  
Adobe Research  
San Jose, USA  
jackwa@adobe.com

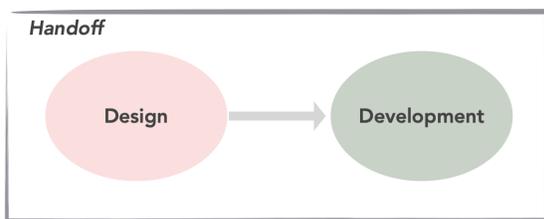
Kyungho Lee  
Ulsan National Institute of Science  
and Technology (UNIST)  
Ulsan, Republic of Korea  
kyungho@unist.ac.kr

Veronica Pimenova  
University of Michigan  
Ann Arbor, USA  
pimenova@umich.edu

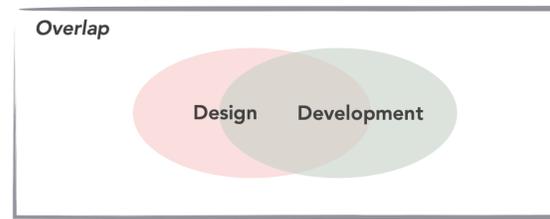
Xiang “Anthony” Chen  
UCLA HCI Research  
Los Angeles, USA  
xac@ucla.edu

Kai Lukoff  
Santa Clara University  
Santa Clara, USA  
klukoff@scu.edu

## Traditional UI Prototyping



## UI Prototyping with Generative AI



**Figure 1: Generative AI blurs the traditional boundary between design and development—transforming the one-directional handoff process into a collaborative, AI-mediated co-creation loop.**

## Abstract

Prototyping has long been central to HCI as a *way of knowing* for exploring and communicating design ideas. Recent advances in **Generative AI Practices**—from **Generative Design to Vibe Coding**—are reshaping who prototypes and how. These approaches blur boundaries between designers and developers, enabling faster, more inclusive workflows while raising new challenges around trust, authorship, and control. This CHI 2026 meet-up will gather researchers and practitioners to discuss how AI-assisted prototyping transforms Houde and Hill’s dimensions of *look and feel* and *implementation*. Through a hands-on **Designathon**, participants will reflect on opportunities, breakdowns, and best practices for human–AI collaboration in prototyping.

## CCS Concepts

- **Human-centered computing;**

### ACM Reference Format:

Xinqi Zhang, Hari Subramonyam, Advait Sarkar, Ian Drosos, Jack Wang, Kyungho Lee, Veronica Pimenova, Xiang “Anthony” Chen, and Kai Lukoff. 2026. Generative Design and Vibe Coding: Rethinking The Design-Development Divide for UI Prototyping. In *Extended Abstracts of the 2026 CHI Conference on Human Factors in Computing Systems (CHI EA '26)*, April 13–17, 2026, Barcelona, Spain. ACM, New York, NY, USA, 3 pages. <https://doi.org/10.1145/3772363.3778802>

## 1 Motivation

Prototyping has long been recognized as a central practice in HCI and design—not merely a step toward production, but a way of knowing for designers [2]. Through prototypes, teams can *explore, evaluate, and communicate* ideas about future systems by materializing questions about function, form, and interaction. Building on Houde and Hill’s influential framework [5], we consider three core dimensions—*role, look and feel, and implementation*—through which prototypes clarify aspects of an interactive system and make them discussable among diverse stakeholders. Traditionally, there



This work is licensed under a Creative Commons Attribution 4.0 International License. *CHI EA '26, Barcelona, Spain*

© 2026 Copyright held by the owner/author(s).  
ACM ISBN 979-8-4007-2281-3/2026/04  
<https://doi.org/10.1145/3772363.3778802>

has been a divide between designers and developers in UI prototyping: designers focus on conceptualizing and visualizing ideas, while developers translate those ideas into functional implementations.

However, recent advances in Generative AI are transforming this landscape, blurring the boundaries between design and development [3, 13]. These tools make prototyping faster, more accessible, and more inclusive—allowing individuals with little design or coding experience to meaningfully participate in creative and technical processes [1]. Two emerging paradigms illustrate this shift: Generative Design and Vibe Coding. Generative design tools—such as Uizard, Google Stitch, and Adobe Firefly—enable designers to rapidly explore divergent interface concepts through co-creation with AI [4, 7]. In contrast, vibe coding, supported by tools such as V0.dev, Bolt.new, Lovable, Cursor, and Windsurf, focuses on building and delivering interactive experiences, allowing users to create functional prototypes through natural-language prompts [12]. Together, these paradigms illustrate how generative AI tools are taking on co-creative roles in both design and implementation, creating increasing overlap between the two domains. (Figure 1).

This change is evident across both design and development communities. At the 2025 Caffeine AI Hackathon, for example, non-technical participants were able to build fully functional apps—such as a step-by-step legal document generator for simple wills—in just a few hours without writing any code [1]. Conversely, developers are now leveraging vibe coding to independently prototype interface elements and user experiences that previously required design collaboration. A prominent example is the work of AI researcher Andrej Karpathy, the originator of the term vibe coding. Karpathy demonstrated this vision through MenuGen, a project built entirely through conversational interaction with Claude and Cursor, in which he rapidly generated and refined a restaurant app’s interface, logic, and deployment end-to-end [6]. Together, these examples illustrate how generative AI is transforming prototyping into a shared creative space, empowering both designers and developers to fluidly move between visual exploration and functional realization.

Researchers have begun to document the broader implications of this transformation. Sarkar and Drosos [12] describe vibe coding as an early form of *material disengagement*, where people orchestrate digital creation through AI intermediaries rather than direct manipulation. This shift allows non-technical participants to engage in design and development as part of a larger human–AI collaboration. Examples from Silicon Valley hackathons and “vibathons” demonstrate this trend in action: participants with no coding background now build polished, functional prototypes in hours [1, 10], while solo entrepreneurs have leveraged vibe coding to quickly launch small, AI-driven startups [8].

However, recent studies also reveal important cognitive, technical, and ethical challenges emerging from these practices. Pimenova et al. [9] found that while generative AI tools make software creation faster, more joyful, and more creative, they also introduce breakdowns in *trust, focus, and understanding*. Designers and developers struggle with *misalignments between human intent and AI output*, difficulties in *maintaining structure and reliability*, and the uneasy experience of *surrendering control* to AI during creative flow. These findings highlight the need to critically reflect on how generative AI can best be integrated into prototyping workflows—so that

people benefit from its support without losing agency, creativity, or rigor.

## 2 Meetup Format

To advance this conversation, our meet-up adopts a creative **Designathon** format—an immersive, hands-on activity that brings everyone together to explore how generative AI reshapes prototyping across design and development. Grounded in Houde and Hill’s *look and feel* and *implementation* dimensions, participants will engage in hands-on creation and reflection using a shared vocabulary. This 90-minute session will blend inspiration, hands-on prototyping, and reflection: following a short introduction (10 min) and demos of browser-based generative design and vibe-coding tools such as *V0.app*, *Bolt.new*, and *Lovable* (15 min), participants will join a Designathon (40 min) to prototype solutions to a shared design brief—e.g., helping CHI attendees find sessions that match their interests—before concluding with a group reflection (20 min) using Houde & Hill’s framework and a brief closing (5 min). For additional details on the activity structure, design brief examples, and logistics, please see the Supplemental Material.

Organized by an international team of researchers and practitioners from Santa Clara University, Stanford, Adobe, UCLA—with collaborators from the United Kingdom, South Korea, and Michigan—this meet-up will bring together researchers, practitioners, and tool builders in HCI, design research, human–AI interaction, creativity support, and software engineering education, along with designers, developers, educators, and non-technical creators curious about how Generative AI is changing design and development workflows. Together, we aim to identify emerging best practices for AI-assisted prototyping and inspire future research on inclusive, human-centered design and development.

## 3 Organizers

**Xinqi Zhang** is a PhD student in the Human-Computer Interaction Lab at Santa Clara University. Her research explores how AI agents can support digital wellbeing and how AI tools can bridge technical gaps for novices. She is also deeply involved in the Bay Area hackathon community, helping to host events since March 2025 when the “Vibathon” phenomenon first landed in Silicon Valley. Xinqi will serve as the event host for the meetup.

**Hari Subramonyam** is an Assistant Professor (Research) at Stanford University. His work focuses on cognitively informed design, co-design with learners and educators, and the development of transformative AI-enabled learning experiences. He also advances design tools and methodologies that center ethics, responsible design, and human values in AI systems.

**Advait Sarkar** is a researcher at Microsoft, and lecturer at the University of Cambridge and University College London. He studies the effects of Generative AI on knowledge work, productivity, and creativity, including the first empirical study of vibe coding [12]. He leads a research agenda aimed at enhancing critical thinking with Generative AI in Microsoft’s Tools for Thought group. His article “AI Should Challenge, Not Obey” [11] was the cover story in the October 2024 issue of Communications of the ACM.

**Ian Drosos** is a Member of Technical Staff at Trent AI, where he designs and develops user experiences for creating and steering AI agents that enable secure code and processes. His work focuses on advancing generative UX approaches while addressing the challenges and risks associated with vibe coding and modern development workflows.

**Jack Wang** is a researcher at Adobe research. His work revolves around developing human-centered AI and ML technologies for human learning, creativity, and productivity.

**Kyungho Lee** is an Associate Professor at UNIST (Ulsan National Institute of Science & Technology), South Korea, and directs the Expressive Computing Lab. He explores AI as an emerging Tool, Material, and Medium for design. This design-centered philosophy ensures AI's development is guided by human-centered values, driving new forms of computational expression, human-AI co-creation, and inclusive decision-making.

**Veronica Pimenova** is a PhD student at the University of Michigan School of Information. Her research is on human factors of software engineering, with a focus on building AI tools for accessibility and developer productivity in workplace environments.

**Xiang "Anthony" Chen** is an Associate Professor in UCLA's Departments of Electrical & Computer Engineering and Computer Science. He received a Ph.D. in the School of Computer Science at Carnegie Mellon University. Anthony's area of expertise is Human-Computer Interaction (HCI). His research takes a human-centered approach to design, build, and study interactive AI systems that align with human values, assimilate human intents, and augment human abilities, supported by NSF CAREER Award, ONR YIP Award, Google Research Scholar Award, Intel Rising Star Award, Hellman Fellowship, NSF CRII Award, and Adobe Ph.D. Fellowship. Anthony's work has resulted in 60+ publications with three best paper awards and four honorable mentions in top-tier HCI conferences.

**Kai Lukoff** is an Assistant Professor at Santa Clara University, where his research explores human-centered AI design and its implications for prototyping and user agency. He also teaches software engineering with a focus on how students can critically and creatively integrate AI tools into their development workflows.

## Acknowledgments

The authors used OpenAI's ChatGPT (GPT-5) to assist with language editing, including grammar correction, phrasing refinement, and formatting in LaTeX. All conceptual content, arguments, and structure were developed by the authors. The use of AI assistance complied with ACM's policy on the responsible use of generative AI tools in publications. The authors take full responsibility for the content of this work.

## References

- [1] 2025. Caffeine Hackathon 2025: Vibe Coding Showcase. <https://www.youtube.com/watch?v=xHELLIWTNDg&list=PLVA0Ai2w3BxBWknkEbFL4Q5fnCjkPeqkI>. Accessed: 2025-09-19.
- [2] Michel Beaudouin-Lafon and Wendy Mackay. 2012. *Prototyping Tools and Techniques*. 1081–1104. doi:10.1201/b11963-55
- [3] Xiang 'Anthony' Chen, Tiffany Knearem, and Yang Li. 2025. The GenUI Study: Exploring the Design of Generative UI Tools to Support UX Practitioners and Beyond. In *Proceedings of the 2025 ACM Designing Interactive Systems Conference (DIS '25)*. ACM, 1179–1196. doi:10.1145/3715336.3735780
- [4] CJ Gammon. 2025. From idea to interface: A designer's guide to AI-powered prototyping. <https://adobe.design/stories/leading-design/from-idea-to-interface-a-designer-s-guide-to-ai-powered-prototyping>
- [5] Stephanie Houde and Charles Hill. 1997. What do Prototypes Prototype? 2 (12 1997). doi:10.1016/B978-044481862-1/50082-0
- [6] Andrej Karpathy. 2025. *Vibe Coding a MenuGen App*. <https://karpathy.bearblog.dev/vibe-coding-menugen/>. Accessed: 2025-09-19.
- [7] Kyungho Lee. 2025. Towards a Working Definition of Designing Generative User Interfaces. doi:10.48550/arXiv.2505.15049
- [8] Amjad Masad. 2025. *Replit's CEO Says Vibe Coding Is Powering a New Wave*. <https://www.businessinsider.com/replit-ceo-vibe-coding-solo-startups-2025-8>. Accessed: 2025-09-19.
- [9] Veronica Pimenova, Sarah Fakhoury, Christian Bird, Margaret-Anne Storey, and Madeline Endres. 2025. Good Vibrations? A Qualitative Study of Co-Creation, Communication, Flow, and Trust in Vibe Coding. doi:10.48550/arXiv.2509.12491
- [10] Cheryl Robinson. 2025. *Vibeathons Are Taking Over Hackathons To Rapidly Increase Innovation*. <https://www.forbes.com/sites/cherylrobinson/2025/07/27/vibeathons-are-taking-over-hackathons-to-rapidly-increase-innovation/>. Accessed: 2025-09-19.
- [11] Advait Sarkar. 2024. AI Should Challenge, Not Obey. *Commun. ACM* (Sept. 2024), 5 pages. doi:10.1145/3649404 Online First.
- [12] Advait Sarkar and Ian Drosos. 2025. Vibe coding: programming through conversation with artificial intelligence. doi:10.48550/arXiv.2506.23253
- [13] Hari Subramonyam, Divy Thakkar, Andrew Ku, Jürgen Dieber, and Anoop Sinha. 2025. Prototyping with Prompts: Emerging Approaches and Challenges in Generative AI Design for Collaborative Software Teams. arXiv:2402.17721 [cs.HC] <https://arxiv.org/abs/2402.17721>