YASMINE KOTTURI   RESEARCH STATEMENT

The "Future of Work" is here, but do workers have the support they need to benefit from it? For independent workers such as gig workers, online freelancers, and even micro-entrepreneurs, online marketplaces and AI-assisted tools enable workers to be their own boss and work anywhere, at any time. Individuals without formal business training can quickly turn side hustles into small businesses, if they can fully grasp the tools. Yet, as the independent workforce grows rapidly--with current participation from one in three U.S.-based adults [1]--workers often do not experience these benefits because of social isolation, burnout, intellectual property infringement, and technical skill barriers.

Through deep engagement with community partners, my research uncovers how independent workers overcome these challenges. To augment worker-driven strategies, I build sociotechnical systems that bolster social support among workers and enable early-stage design feedback among creative entrepreneurs while safeguarding intellectual property [14], technical skill acquisition among local entrepreneurs by centering trust building [11], and impartial peer feedback on job materials among online freelancers [12]. Driven by multi-year partnerships with two local community centers--a feminist makerspace and an entrepreneurial hub dedicated to gender and racial equity--my work highlights the in-depth relational work required to foster social support and build trust between workers, as well as between workers and computing researchers [10]. Taken together, my work contributes a rich, qualitative and longitudinal understanding of how workers from marginalized backgrounds sustain digitized forms of work and achieve their goals [2, 3, 9], configurations of social support which span online and offline networks and amplify the resourceful tactics workers already possess [12, 14], and a model for technical capacity building among the independent workforce for long-term career success [10, 11]. In doing so, my work lies at the intersection of human-computer interaction, social computing, and community-driven technology development.

CO-DESIGNING PEER SUPPORT SYSTEM WITH CREATIVE ENTREPRENEURS

Creative entrepreneurs rely on online platforms to build community--such as among the 7.5 million Etsy sellers--in order to overcome isolated work conditions. However, because of frequent attempts by larger brands to use their work without permission, creative entrepreneurs constrain their use of community-building technologies in order to safeguard their work and creative reputation [4, 8, 9]. I therefore engaged in a multi-year partnership with a local feminist makerspace to co-design a social platform, called Peerdea, with 46 entrepreneurs and makerspace leadership. By aligning the platform's design with the makerspace's community of practice [17], Peerdea leveraged the trust building which occurred more readily in-person for marginalized entrepreneurs--who often start their business out of necessity rather than choice and therefore must manage high levels of risk. In doing so, online feedback, information exchange, goal setting and accountability were readily available to them; entrepreneurs even sought feedback on in-progress and unpolished work on Peerdea [14]. Moreover, by using design methodologies which account for unspoken power dynamics, stakeholders' expertise and tacit knowledge were prioritized throughout the design process. Peerdea is now formally integrated within the feminist makerspace's annual incubator, and is open source (peerdea.app, github.com/ykotturi/peerdea/). In addition, key design implications from this work have been adopted by both the Etsy Seller and Instragram Small Business teams during my collaborations with each, such as protecting creative reputation alongside garnering feedback on in-progress work online [8].
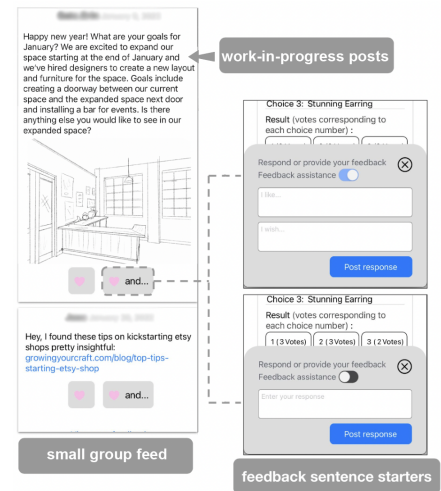
Peerdea, a mobile application for iOS and Android, fosters on-the-go community building, goal setting and accountability, and early-stage product feedback, all the while safeguarding creative entrepreneurs' intellectual property and reputation (Kotturi et al., 2024).

TECHNICAL CAPACITY BUILDING WITH LOCAL ENTREPRENEURS FROM LEAN ECONOMIES

Whether a creative entrepreneur or an entrepreneur with a cleaning business, entrepreneurs whose businesses are not technological in nature still need to be able to use a wide range of computing technologies

in order to achieve their business goals. Common models of technology support are often too expensive, ephemeral, quickly deprecated, or lack value alignment and trust, especially with marginalized entrepreneurs who may have experienced tech-based harm and erasure. Therefore, I followed a participatory action research approach--where active participation from community stakeholders in research activities facilitates more democratic research practices [5]--with an entrepreneurial hub is based in a low-income community and is dedicated to racial justice. Together, we designed Tech Help Desk (forge.community/services): a novel model of technical support for local entrepreneurs (i.e., entrepreneurs who primarily target their local economy) [11]. This model emphasized in-person relationship building through few-to-one actionable tutoring sessions among entrepreneurs and providers: local engineering PhD students trained in community-based methods. Tech Help Desk continues to offer in-person tech support every Wednesday for over four years, and is now embedded in the hub's ongoing programming [10]. This year, over 70 entrepreneurs have used Tech Help Desk to address a range of computing issues including: website maintenance, search engine optimization, clearing and organizing local and cloud storage, and effective typing techniques (i.e., "long tail of computing challenges" [11]). Critically, in-person relationship building was essential to reduce risks associated with seeking and receiving technical advice.

Tech Help Desk is a weekly, in-person service which provides free technical support for local entrepreneurs and centers around trust and relationship building (Kotturi et al., 2022).

SCALABLE PEER FEEDBACK SYSTEM FOR ONLINE FREELANCERS AND CROWD WORKERS

While Peerdea and Tech Help Desk provide social support among local networks, sociotechnical systems must also be able to respond to large-scale needs for skill and professional development among workers. For instance, in large online labor markets such as Upwork.com, online freelancers often go without mentorship or formal structures of career support. In particular, there exists few opportunities to receive high-quality feedback on job materials and effectively identify needed skills to improve job outcomes [2]. I developed Hirepeer which introduced new algorithms to enable peer assessment of job materials among online freelancers [12]. Hirepeer coordinated anonymized peer feedback online: workers who applied for an online task peer assessed other applications to determine who was the most qualified. Along the way, workers viewed each others' job materials and provided peer feedback through a structured process of comparative peer review. To address the conflicts of interest, Hirepeer introduced three novel aggregation mechanisms which guaranteed impartial rankings of applicants [6]. Through two between-subjects experiments and one pilot study with 331 online crowd workers and freelancers (Mturk.com and Upwork.com), I found guaranteeing impartiality in peer assessment led to only a modest loss in ranking accuracy (8%) as compared to aggregation mechanisms with no impartial guarantees [12]. By guaranteeing impartiality, Hirepeer provided freelancers with real-time feedback on their job materials which harnessed the domain expertise of job applicants. In doing so, Hirepeer showcased how peer feedback at large scale--traditionally restricted to classroom settings [13]--can extend to online marketplaces to assist online freelancers with job material improvements and ultimately grow their careers.

FUTURE WORK

Achieving equitable futures of work and entrepreneurship requires trustworthy systems to facilitate technical capacity building, social support, and long-term career guidance. Yet, sociotechnical approaches will be insufficient without adequate wrap-around support for workers, alongside advancements in community-driven technology development approaches. Therefore, my future work will focus on building wrap-around support for marginalized workers' business and occupational development, as well as focus on AI literacy among workers. In doing so, my future work will also address the challenges of leveraging community-driven approaches in computing within a university setting.

Transforming Makers to Maker Entrepreneurs with Identity and Business Support

In a recently funded NSF award (on which I am a CO-PI), we are investigating how "makers" become "maker entrepreneurs". In an initial study, we conducted semi-structured interviews with 26 maker entrepreneurs and seven entrepreneurial support personnel which revealed the unique challenges of maker entrepreneurs due to the physicality and small scale of their work, as well as unique motivations [4]. For instance, maker

entrepreneurs often begin their business pursuits with anti-capitalist visions, but ultimately find themselves grappling with the need to make a profit to sustain themselves. Therefore, through existing and new partnerships with makerspaces dedicated to equity, I will build tools with makers which support makers' non-monetary values (e.g., community well-being and environmental accountability) alongside profitability. For instance, online marketplaces could be redesigned to center makers' values through offering bartering and skill sharing opportunities as alternative forms of currency. In addition, building on my collaboration with Etsy [8], I will explore occupational identity development among makers through in-person workshops supplemented with digital storytelling. For example, given the tensions that maker entrepreneurs experience between capitalist pursuits and anti-capitalist values [4], alongside the tight coupling of personal and professional identities [9], this work will seek to collectively document these lived tensions by creating a repository of stories for how maker entrepreneurs set (or do not set) boundaries between work and life. Together, such a repository will provide nuanced and granular documentation of the everyday tensions makers navigate as a vehicle for social change.

Deconstructing Veneer of Simplicity: Equitable Generative AI in the Future of Work

During an introductory generative AI workshop series, local entrepreneurs detailed concerns (e.g. ethical implications) and desires (e.g., personalized assistance) for use when their livelihoods were implicated (Kotturi et al., 2024).

While many tout the potential of generative AI technologies to level the playing field in entrepreneurship (by providing entrepreneurs from resource-constrained communities intelligent assistants to outsource tasks), there exist growing disparities of use among marginalized entrepreneurs [16]. In a recent introductory generative AI workshop series I co-designed with a local entrepreneurial hub [7], we asked: how do local entrepreneurs use (and prefer not to use) generative AI platforms for their business, and what concerns do entrepreneurs have when adopting generative AI in their business? By coupling workshops with 15 semi-structured interviews with entrepreneurs and community providers, we found that while generative AI technologies are often presented with ready-to-use simplicity, there are often overlooked operational and strategic technical skills required for successful use (e.g., browser and storage literacy, password management, file type conversion, and more). In future work, I will explore sociotechnical interventions that address these overlooked AI literacies such as creating and embedding literacy modules for generative AI within the community's existing resources (e.g., Tech Help Desk forge.community/services/tech-help-desk). Additionally, we found that, on the one hand, learning in a communal setting was critical to overcome the "techno-anxieties" generative AI tools can elicit. On the other hand, participants expressed concerns about peers' judgements of their technical acuity. Therefore, I will investigate configurations of human and AI-assisted support such as when providing feedback to improve prompt quality. Such a hybrid approach is well equipped to address the need for large-scale support when onboarding entrepreneurs to generative AI technologies.

Advancing Community-Based Participatory Research in Computing

The methodological evolution in my work has informed my deep understanding that, just as important as *what* system is built, it matters *how* that system is built. While community-based approaches often promise more just, and equitable futures for computing, structural barriers to these approaches exist such as pressures for scalability and universality, ephemeral timelines, lack of institutional recognition of exploitative histories, and more [10, 15]. Therefore, I will continue to develop community-based approaches in computing to ensure communities are equipped with resources to challenge and hold accountable their academic partnerships, students have the necessary training to engage such methods, and faculty are able to more easily communicate the value of this research approach to their academic institutions. For instance, building on recent cross-institutional collaborations [10, 15], I will conduct ethnographic work such as participant observation and semi-structured interviews with researchers who have long-standing expertise in community-based methods in different disciplines such as in public health. Comparative analysis of practical tactics for implementing community-based approaches across disciplines will make salient generative challenges, as well as build a repository of solutions. My efforts to advance community-based approaches will be done in tandem with my

university's ongoing initiatives for more equitable research practices. Together, this work will facilitate the infrastructural capacity building that is required for more equitable futures of work.

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