Research Statement

Jane Hsieh

As a **human computer interaction (HCI)** and **social computing** researcher, my work focuses on ***understanding and reshaping how disruptive technologies interact with and impact the futures of workers and users*.** To promote more collective, safe and prosperous communities, I draw upon multi-stakeholder/scalar techniques including quantitative empirical methods (*e.g.* statistical analysis, LLM probes), grounded qualitative approaches (*e.g.* co-design/interviews in solidarity with workers) and system development (*e.g.* technological probes/interventions).

One type of worker I study is **platform-based gig workers**, whose labor and services are increasingly woven into the fabric of everyday life. For consumers, gigs offer convenient, on-demand help with everyday tasks (from Ubering, to caretaking, to creative and professional projects) that mobilizes the wide-ranging expertise of a global workforce. For workers, the short-term, task-based and contractual nature of gigs represents *liberation* from traditional jobs and organizations – affording them perceived freedoms to choose not only *when* and *where* to labor, but also ***what*** to work on. However, as platforms mediate between consumers and workers, their hegemonic (data) practices shift significant agency and control away from both stakeholder groups. To centralize power, platforms capitalize on the absence of legal protections (for gig laborers) to exploit workers physically, financially and psychologically. With ever-accelerating rates of turnover and displacement, how do we create transformative interventions that propel workforces toward more natural, empowered and ***truly liberated*** future interactions? Overall, the primary themes of my research

① employs large-scale computational methods to uncover worker practices [1] and intentions [11]
② co-designs with multi-stakeholder communities to envision collective, sustainable futures [2, 5, 6]
③ develops creative, contextualized [7] and provocative interventions to facilitate more joyful [10], pluralistic [3, 9] and user-centered interactions.

At the intersection of the HCI, CSCW[1] and design communities, my thesis work applied human-centered techniques to understand *interactions between disruptive technologies* (*i.e.* gig platforms) and *stakeholders* (*i.e.* workers, consumers, regulators), followed by the **design and development of *alternative interventions to probe and reshape oppressive technology*-mediated relations**. I contributed to 11 peer-reviewed publications/workshop (7 as first-author, 1 last-author) across a range of venues: ACM CHI, CSCW, DIS, UIST, CHIWORK and IEEE VL/HCC. Two of my first-authored publications received best paper and honorable mention recognitions at CHI and CHIWORK, and I acquired over $224,000 in funding as a NSF GRFP recipient and a Block Center for Technology and Society grant awardee.

By investigating timely challenges with multi-stakeholder and multi-scalar approaches, I aim to continue *surfacing* **timeless and generalizable design implications and interventions** that **guide workforces in navigating futures of disruptive technologies**. I am passionate about creatively applying my empirical and design expertise to support workers by (1) promoting *responsible technology consumption* (2) *visibilizing undervalued labor* and (3) cultivating more *supportive and pluralistic online communities*.

① Understanding Worker Practices & Rationales via Large-Scale Data Analysis [1, 11]

Gig platforms commonly leverage a consumer-first rhetoric to justify and evade accountability for their unfair labor practices. But despite the competitive and isolating platform environments, workers continue to willingly engage – suggesting the presence of underexplored intrinsic motivations that drive them to develop strategies for navigating unexpected challenges. In my first pair of contributions, I present large-scale analyses that uncover (1) *how* freelancers communicate on platforms to achieve productivity and success – determined by measures such as project acquisition and completion rates, long-term earnings (Fig. 1) as well as (2) crowdworker rationales on *why* they perform platform-mediated gigs despite harsh working conditions.

[1] Computer-supported cooperative work

Research Statement

Jane Hsieh

The widespread adoption of remote work fueled tremendous growth for how virtually deliverable services (*e.g.* crowdsourcing, online freelancing) operate. But remote digital work ultimately lacks resources of established workplaces and physically co-located peers, requiring workers to practice effective communication, bricolage as well as time and reputation management. To scalably understand individual strategies that workers develop, we engaged in multi-month negotiations with collaborators to access a large-scale dataset (> 2 million messages across >58k freelancers and >56k projects) from a leading online freelancing labor market. Applying regression analyses on these platform-mediated freelancer-client communications, I uncovered statistically significant correlations between (1) personalized message content and higher job acquisition rates (2) standardized messaging schedules and increased job completion rates, as well as (3) repeated uses of (standardized) templates across projects that associated with greater long term bid volumes and revenue [1].

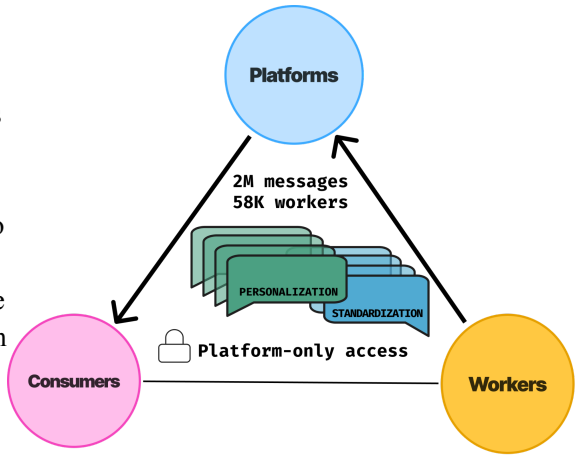

Fig 1. Platform-mediated Worker-Client Communication

Stepping beyond strategies, I also participated in a recent collaboration to explore the potential of harnessing the *persuasive power* of language models for revealing latent worker (1) *grievances* for vulnerabilities that typically remain undisclosed due to fears of platform retaliation and (2) ***rationales*** that explain why they perform gigs despite subpar working conditions – including desires to **preserve independence**, relative **flexibility** as well as **trust** in platforms. This investigation [11] first gathered responses of 263 Prolific crowdworkers toward five common myths around gig work conditions; we then generated persuasive (and personalized) LLM responses to further probe underlying worker incentives. Taken together, these two studies demonstrated the feasibility for gathering actionable strategies from close-sourced platform data, as well as the potential for provocative interventions to uncover hidden worker motivations.

② Co-designing Multi-Stakeholder Interventions for Platform Accountability [2, 5, 6, 7]

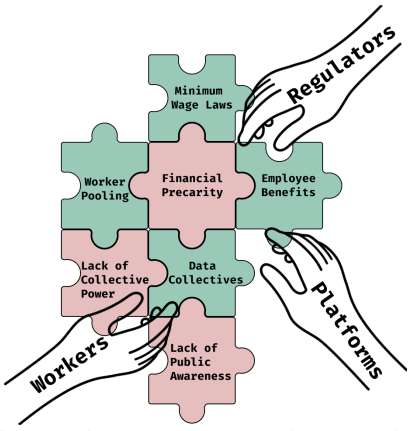

Fig. 2 Multi-Stakeholder Co-design of Solutions

Mobilizing the data and efforts of a large-scale online workforce uncovers crucial strategies and rationales for performing gig labor. But in the offline and physical world, meaningful advances to gig labor rights and protections require infrastructural and material reforms that involve advocacy and action from higher-power stakeholders.

How to synergistically integrate efforts from multiple stakeholder groups that hold conflicting objectives? To direct stakeholder priorities in more productive ways, I led co-design workshops with policy experts, platform employees and workers to tackle five problematic working conditions commonly uncovered by previous scholarship and journalism [2]. Following our solution-oriented version of the speed-dating design method, stakeholders generated and ranked **infrastructural interventions** they are most prepared or motivated to support and implement (Fig. 2), including visions of stronger regulation, worker-owned cooperatives and platform-government co-regulation. Beyond macro-scale recommendations, stakeholders also envisioned more **incremental advances** such as platform-driven services/programs, collectivizing technologies — including tools for enhancing scheduling, surfacing local resources and supporting financial well-being.

Uncovering collective visions for infrastructural and regulatory change constitutes a critical first step, but how do we incentivize stakeholders to implement worker-centered protections and support in practice? Through a CSCW '24 workshop, I led like-minded scholars to explore the promise of **worker data collectives** [6] for enacting counterdata production as well as advocacy and policy advances. But while the idea of information sharing among gig workers appeals highly to researchers, how do we ensure that collected data actually support initiatives that matter to workers? Even when it does, what affordances and mechanisms would *motivate workers to actively engage* in collective data-sharing?

To examine these tensions, I interviewed policy experts from varying levels of office, and co-designed with active workers across four domains to identify shared and divergent priorities [5]. The surfaced initiatives (*i.e.* equity, safety, fair pay) and design recommendations (*e.g.* corresponding data needs, preferred sharing methods, anticipated implementation and governance challenges) subsequently informed early-stage designs for a data-sharing prototype. Then, I led an interdisciplinary team (across software engineering, design and qualitative research) to iterate on and refine wireframes for a tool that shares data between cross-platform workers (from pink-, white- and blue-collar domains) and policymaking stakeholders (Fig. 3). This process culminated in Gig2Gether, an open-sourced web app allowing users to track and share gig work data, view aggregate data visualizations and post qualitative stories about labor conditions that promote evidence-based advocacy and policymaking [6]. In a 7-day field evaluation with 16 participants, Gig2Gether facilitated **cross-platform mutual support** and financial reflection/planning, in addition to revealing latent worker desires for future use cases — including *collective algorithmic auditing*, *policy advocacy* as well as more complex interaction modes with fellow gig workers. For one Gig2Gether user, the tool represented "*a door between [gig workers] and politicians*".

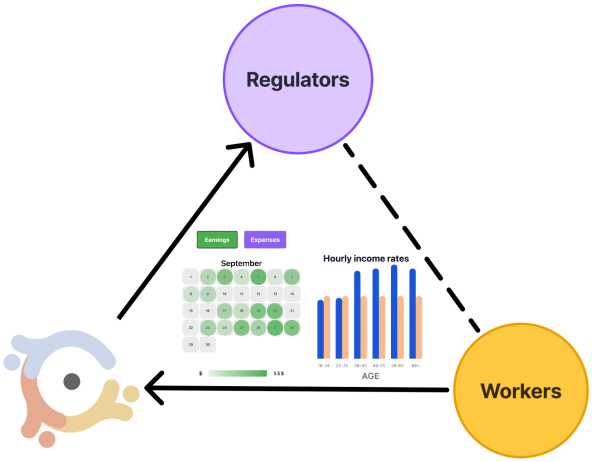

Fig 3. Gig2Gether Bridges Worker-Policymaker Data Gap

③ Building to Evoke Sociable & Pluralistic Interactions amidst Evolving Tech [3, 9, 10]

Alongside technological interventions surfaced in theme ②, regulators of our multi-stakeholder workshops [2] also called for increased and individualized policy. In response, I synthesized legal and policy documents, labor regulations, exemplary state bills and HCI scholarship to envision advances to existing legislation. This led to an award-winning position paper [3] advocating for more targeted and pluralistic policies and protections that consider the diverse task domains and intersectional backgrounds of gig workers.

Gig platforms were disruptive technologies that transformed traditional relations between consumers and workers. During this process, we've overlooked how **gig workers are also consumers** of platform resources (*e.g.* client pool, matching algorithms) — making them *prosumers*[2]. Platforms primarily rely on exploiting this legal loophole (*i.e.* the non-employee status of workers) to evade employer accountabilities – causing workers to shoulder *immaterial and emotional burdens and vulnerabilities alone*. Coupled with intense market competition, such consumer oversight intensifies unrealistic expectations of service from workers, without adequate infrastructures for grassroots advocacy or regulatory protection. How can we develop creative and approachable interventions that (1) evoke user ***empathy***, ***trust-building*** and ***solidarity*** among consumers and workers while (2) supporting user ***agency*** that promote ***pluralistic*** values of both stakeholder groups?

[2] As prosumers (Toffler, 1980), gig workers simultaneously **produce** capital for platforms while **consuming** their resources.

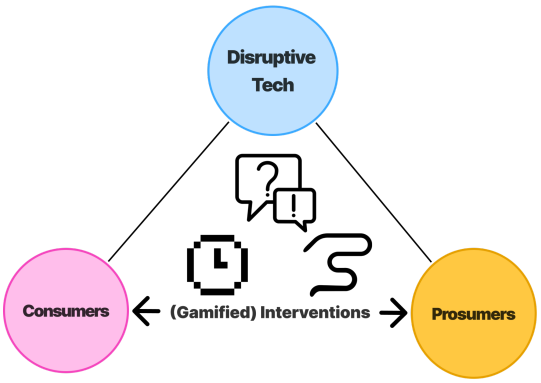

Fig 4. Promoting Consumer-driven Advocacy

To approach ***worker-consumer co-liberation*** without triggering consumers' psychological reactance over lost agency, I examined the context of rideshare to explore how creatively gamified interventions can evoke joyful interactions while promoting passenger engagement — helping passengers understand, empathize with and advocate for latent rideshare driving conditions such as unseen labor, logistics and costs [10]. To begin, I led two students to develop six interactive in-ride games to probe and anticipate stakeholder reactions and behaviors. Through 9 workshops with 19 drivers and 15 riders, I uncovered driver desires for natural and unforced social interactions (*e.g.* conversations, play) with riders, passenger knowledge gaps around rideshare (*e.g.*, rating-imposed expectations, long-term health impacts), design opportunities for managing content (*i.e.* balancing lighter and approachable topics with more thought-provoking but emotionally-intense ones) and consent (*i.e.* maintaining socially appropriate levels of psychological distance) as well as alternative interactions and incentives to motivate consumer engagement.

Besides their labor relations, both worker and consumer groups produce value for platforms as *data contributors*. As the digital creator economy expands, data creation and consumption are increasingly common and integrated practices across domains such as art, content creation or knowledge work. These progressively diverse, innovative and dynamic digital environments hold tremendous promise for driving issues of societal importance. For instance, creative professionals (especially those producing visual content) represent another worker group whose labor outputs are frequently monetized and appropriated by technologies that mediate their work, including text-to-image generation tools. To combat normative model biases and personalize outputs to increase user agency, I led a team of interdisciplinary researchers across HCI and AI to design and evaluation of POET, a real-time interactive tool that (1) automatically discovers visual homogeneities in text-to-image generative models, (2) expands these to diversify generated output images, and (3) learns from user feedback to personalize expansions [9]. By juxtaposing a single image output with more visually diverse alternatives, our cross-domain user study with 28 participants showed how POET probed creators to deliberate and reflect on wider ranges of possibilities while efficiently supporting more pluralistic and personalized values — offering an extensible framework for mitigating normative dimensions of AI-generated outputs.

Future Research Aims

Large scale online networks began by connecting us socially and informationally, but have advanced to mediate many more connections, including physical (gig-based transportation), organizational (Slack/Zoom), transactional and creative relations. I look forward to applying my interdisciplinary, multi-scalar and multi-stakeholder approaches to support emerging workforces in **navigating the transformative disruptions of rapidly-advancing technologies**.

Designing Lightweight & Motivating Interactions to Visibilize Labor. To effectively engage stakeholders in learning about and advocating for labor rights, they must first be *motivated* to mobilize and enact change. Gig2Gether offered a digital space for workers across sectors to document invisibilized labor while our gamified interventions from theme ③ opened up spaces for consumers to engage in situationally-relevant social interactions (*e.g.* discussions of rideshare logistics) with drivers. To further motivate stakeholder engagement, I plan to apply design techniques from behavioral economics and gaming to create experiences that are simultaneously joyful, and approachable socially appropriate, but that also evoke consumer motivations to challenge existing labor conditions.

One key challenge that currently prevents workers from actively engaging in more collectivist (data-sharing) practices is the high effort required to document invisible, immaterial and underpaid labor. Emergent modes of lightweight and ephemeral interactions (*e.g.* voice/video-based chatrooms that capture paralinguistic visual cues) offer promise for going beyond text to document, visibilize and revalue labor – especially among more service-based, low-income and vulnerable domains of work.

Towards Co-Liberating Collectivism and Advocacy. In theme ① we leveraged persuasive LLMs to unveil underlying worker objectives to achieve individual autonomy and agency over their labor. Unfortunately, workers' misplaced trust often causes their own disempowerment and exploitation, in service of platform objectives. I believe that the path to justice and liberation for workers requires scalable *consumer support*, and thus plan to combine interventions that elicit multi-stakeholder discourse with analysis techniques (*e.g.* power, conversation) and frameworks (*e.g.* postcolonial) from fields such as organizational management and critical computing to (1) better understand the triadic relations between platforms, workers and consumers (2) promote more responsible technology use and consumption that advocate for worker (data) rights and protections.

As our workforces move toward an era of upskilling and reskilling, I am also excited to apply more scalable data analysis methods that observe and examine cross-sectional and longitudinal effects of naturally occurring shifts, retrospectively or prospectively. For instance, one of our ongoing efforts leverages a rideshare and food delivery dataset to study how drivers adjust and develop temporal schedules to strategize against algorithms or fluctuating consumer demands, as an extension to [1] but in more physical domains. Even with limited access to scalable data with online labor markets, I believe that observational and quasi-experimental approaches can help us gather and measure actionable insights that advance worker objectives and careers.

Building Trustworthy and Pluralistic Digital Communities. Recent advances in generative model capabilities offer exhilarating opportunities to build more trustworthy, pluralistic and sustainable frameworks and communities. Digital communities of today (from gig platforms to OSS environments) suffer from disruption (inappropriate comments [4]) and misaligned incentives. Trust-building relies crucially on socratic discussions and negotiation to reach grounded understandings of pluralistic stakeholder values and objectives. How can we leverage scalable agent-based simulations to model and promote such deliberative practices among our digital communities? Many fear how persuasive AI might to overpower and constrain the human voice, but we demonstrated how persuasive LLMs actually helped simulate debates that reveal and demystify workers' underlying values and rationales [11]. For the educational context, we built PolicyCraft to show how case-grounded deliberation helps contribute towards this collaborative deliberation process [8]. Moving forward, I am eager to explore how such agent-based simulations can help us build more prosocial, civil and natural interactions in future sociotechnical systems – *e.g.* gig work, art [12] and OSS development [4].

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