Examining Crowd Work and Gig Work Through The Historical Lens of Piecework

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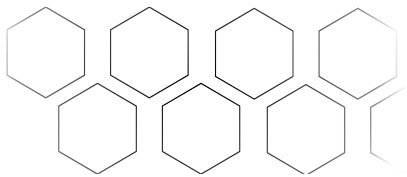
Open problems in crowdsourcing



Tasks

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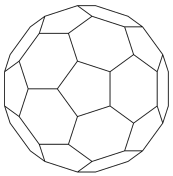

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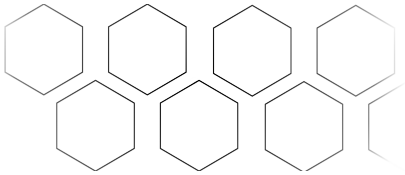

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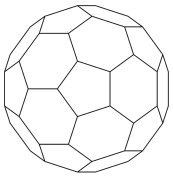

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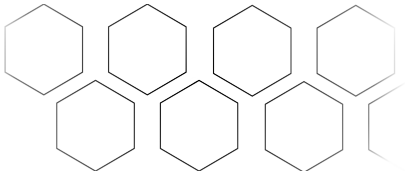

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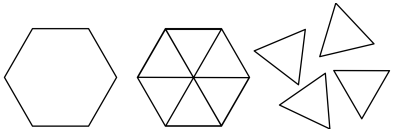

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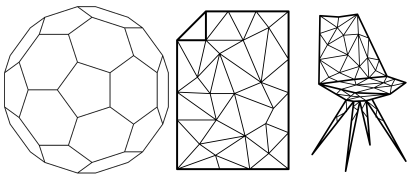

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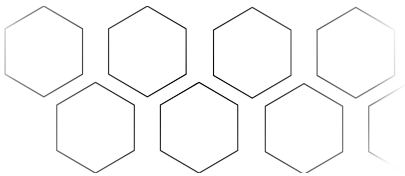

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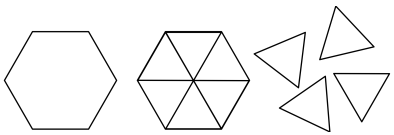

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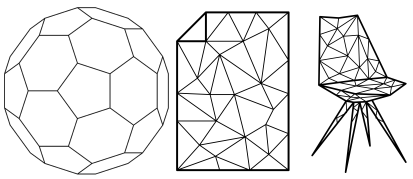

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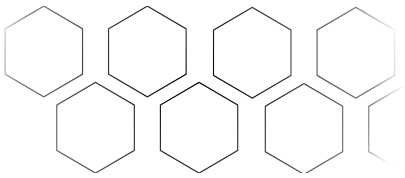

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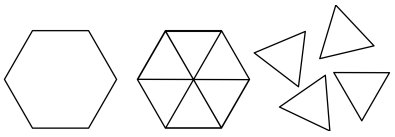

Decomposition

- **Relationships**
  Irani and Silberman [9, 8], Gray et al. [6], McInnis et al. [19], Salehi et al. [23], and Lee et al. [17]

What is the future of work?

We hope to provide:

- A useful ontological lens for making sense of crowdsourcing and gig work (which we collectively call "*on–demand work*") as a resurgence of *piecework*.
- A method for making sense of contemporary phenomena through *historical analysis*.

A CASE FOR COMPARATIVE HISTORICAL ANALYSIS

Historical analysis is nothing new

- Wyche, Sengers, and Grinter [25] and Bødker [2]

A BRIEF GLOSSARY

- Crowd work: digitally mediated **information work** — for example, work done on Amazon Mechanical Turk [14]
- Gig work: digitally mediated — but often **physically embodied** — one–off jobs, such as *driving*, *courier services*, and *administrative support* [5, 22]

Complexity

What kinds of problems do we mean when we talk about complexity?

- **Can crowds improve existing works? [1, 12]**

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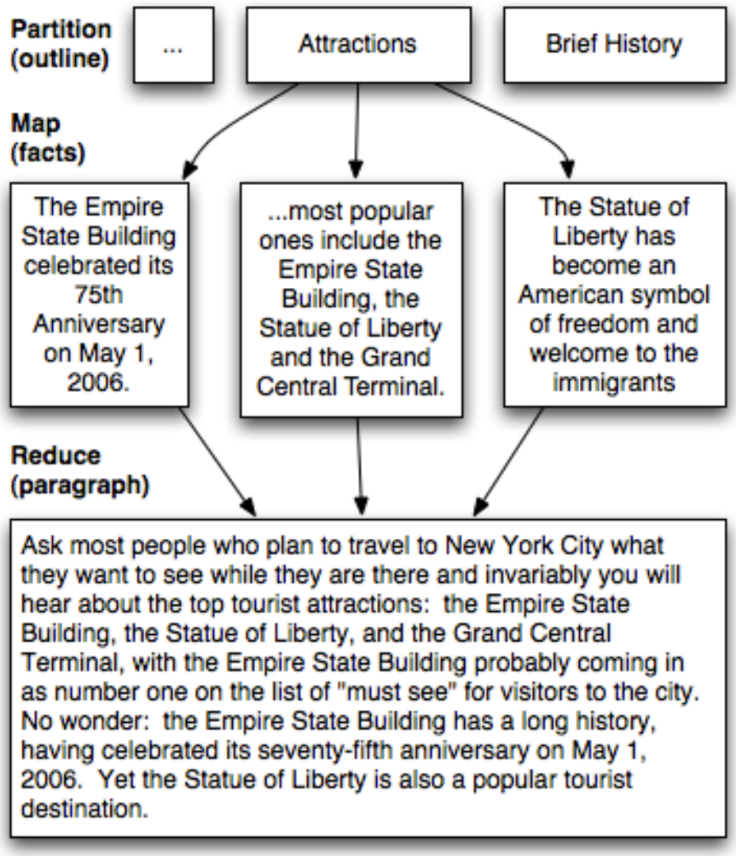
- Can crowds improve existing works? [1, 12]
- Can crowds critique designs? [27]
- **Can crowds create things from whole cloth? [10, 11, 7, 15]**

What does the crowdsourcing literature say?

- Build complexity into the process
  - Apply CS methods to people (Kittur et al. [13])



What does the piecework literature say?

something even more insightful, I'm sure!

Comparerereer

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References

Michael S. Bernstein et al. “Soylent: A Word Processor with a Crowd Inside”. In: *Proceedings of the 23Nd Annual ACM Symposium on User Interface Software and Technology*. UIST ’10. New York, New York, USA: ACM, 2010, pp. 313–322. ISBN: 978-1-4503-0271-5. DOI: 10.1145/1866029.1866078. URL: http://doi.acm.org/10.1145/1866029.1866078.

Susanne Bødker. “Historical analysis and conflicting perspectives—contextualizing HCI”. In: *Human-Computer Interaction* (1993), pp. 1–10.

L. Elisa Celis et al. “Assignment Techniques for Crowdsourcing Sensitive Tasks”. In: *Proceedings of the 19th ACM Conference on Computer–Supported Cooperative Work & Social Computing*. CSCW ’16. ACM, 2016, pp. 836–847. ISBN: 978–1-4503–3592–8. DOI: 10.1145/2818048.2835202.

URL: http://doi.acm.org/10.1145/2818048.2835202.

Joseph Chee Chang, Aniket Kittur, and Nathan Hahn. “Alloy: Clustering with Crowds and Computation”. In: *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. CHI ’16. ACM, 2016, pp. 3180–3191. ISBN: 978-1-4503-3362-7. DOI: 10.1145/2858036.2858411. URL: http://doi.acm.org/10.1145/2858036.2858411.

Gerald Friedman. “Workers without employers: shadow corporations and the rise of the gig economy”. In: *Review of Keynesian Economics* 2 (2014), pp. 171–188.

Mary L. Gray et al. “The Crowd is a Collaborative Network”. In: *Proceedings of the 19th ACM Conference on Computer–Supported Cooperative Work & Social Computing*.

CSCW '16. ACM, 2016, pp. 134–147. ISBN: 978-1-4503-3592-8. DOI: 10.1145/2818048.2819942. URL: http://doi.acm.org/10.1145/2818048.2819942.

Nathan Hahn et al. "The Knowledge Accelerator: Big Picture Thinking in Small Pieces". In: *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. CHI '16. ACM, 2016, pp. 2258–2270. ISBN: 978-1-4503-3362-7. DOI: 10.1145/2858036.2858364. URL: http://doi.acm.org/10.1145/2858036.2858364.

Lilly C. Irani and M. Six Silberman. "Stories We Tell About Labor: Turkopticon and the Trouble with "Design"". In: *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. CHI '16. ACM, 2016, pp. 4573–4586. ISBN: 978-1-4503-3362-7. DOI: 10.1145/2858036.2858592.

URL:
http://doi.acm.org/10.1145/2858036.2858592.

Lilly C. Irani and M. Six Silberman. “Turkopticon: Interrupting Worker Invisibility in Amazon Mechanical Turk”. In: *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. CHI ’13. ACM, 2013, pp. 611–620. ISBN: 978–1-4503–1899–0. DOI: 10.1145/2470654.2470742. URL:
http://doi.acm.org/10.1145/2470654.2470742.

Joy Kim and Andrés Monroy-Hernández. “Storia: Summarizing Social Media Content Based on Narrative Theory Using Crowdsourcing”. In: *Proceedings of the 19th ACM Conference on Computer–Supported Cooperative Work & Social Computing*. CSCW ’16. ACM, 2016, pp. 1018–1027. ISBN: 978–1-4503–3592–8. DOI: 10.1145/2818048.2820072.

URL: http://doi.acm.org/10.1145/2818048.2820072.

Joy Kim et al. “Mechanical Novel: Crowdsourcing Complex Work through Revision”. In: *Proceedings of the 20th ACM Conference on Computer Supported Cooperative Work \& Social Computing*. 2017.

Juho Kim et al. “Crowdsourcing Step-by-step Information Extraction to Enhance Existing How-to Videos”. In: *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. CHI ’14. Toronto, Ontario, Canada: ACM, 2014, pp. 4017–4026. ISBN: 978-1-4503-2473-1. DOI: 10.1145/2556288.2556986. URL: http://doi.acm.org/10.1145/2556288.2556986.

Aniket Kittur et al. “CrowdForge: Crowdsourcing Complex Work”. In: *Proceedings of the 24th Annual ACM Symposium on*

User Interface Software and Technology. UIST '11. ACM, 2011, pp. 43–52. ISBN: 978–1-4503–0716–1. DOI: 10.1145/2047196.2047202. URL: http://doi.acm.org/10.1145/2047196.2047202.

Aniket Kittur et al. "The Future of Crowd Work". In: *Proceedings of the 2013 Conference on Computer Supported Cooperative Work*. CSCW '13. ACM, 2013, pp. 1301–1318. ISBN: 978–1-4503–1331–5. DOI: 10.1145/2441776.2441923. URL: http://doi.acm.org/10.1145/2441776.2441923.

Walter S. Lasecki, Raja Kushalnagar, and Jeffrey P. Bigham. "Legion Scribe: Real-time Captioning by Non-experts". In: *Proceedings of the 16th International ACM SIGACCESS Conference on Computers & Accessibility*. ASSETS '14. Rochester, New York, USA: ACM, 2014, pp. 303–304. ISBN:

978-1-4503-2720-6. DOI: 10.1145/2661334.2661352. URL: http://doi.acm.org/10.1145/2661334.2661352.

Edith Law et al. “Curiosity Killed the Cat, but Makes Crowdwork Better”. In: *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. CHI ’16. ACM, 2016, pp. 4098–4110. ISBN: 978–1-4503–3362–7. DOI: 10.1145/2858036.2858144. URL: http://doi.acm.org/10.1145/2858036.2858144.

Min Kyung Lee et al. “Working with Machines: The Impact of Algorithmic and Data–Driven Management on Human Workers”. In: *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. CHI ’15. ACM, 2015, pp. 1603–1612. ISBN: 978–1-4503–3145–6. DOI:

10.1145/2702123.2702548. URL: http://doi.acm.org/10.1145/2702123.2702548.

Ioanna Lykourentzou et al. “Personality Matters: Balancing for Personality Types Leads to Better Outcomes for Crowd Teams”. In: *Proceedings of the 19th ACM Conference on Computer–Supported Cooperative Work & Social Computing*. CSCW ’16. ACM, 2016, pp. 260–273. ISBN: 978–1-4503–3592–8. DOI: 10.1145/2818048.2819979. URL: http://doi.acm.org/10.1145/2818048.2819979.

Brian McInnis et al. “Taking a HIT: Designing Around Rejection, Mistrust, Risk, and Workers’ Experiences in Amazon Mechanical Turk”. In: *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. CHI ’16. ACM, 2016, pp. 2271–2282. ISBN: 978–1-4503–3362–7. DOI:

10.1145/2858036.2858539. URL: http://doi.acm.org/10.1145/2858036.2858539.

Michael Nebeling et al. “WearWrite: Crowd–Assisted Writing from Smartwatches”. In: *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. CHI ’16. ACM, 2016, pp. 3834–3846. ISBN: 978–1-4503–3362–7. DOI: 10.1145/2858036.2858169. URL: http://doi.acm.org/10.1145/2858036.2858169.

Edward Newell and Derek Ruths. “How One Microtask Affects Another”. In: *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. CHI ’16. ACM, 2016, pp. 3155–3166. ISBN: 978–1-4503–3362–7. DOI: 10.1145/2858036.2858490. URL: http://doi.acm.org/10.1145/2858036.2858490.

Paolo Parigi and Xiao Ma. “The Gig Economy”. In: *XRDS* 23.2 (Dec. 2016), pp. 38–41. ISSN: 1528-4972. DOI: 10.1145/3013496. URL: http://doi.acm.org/10.1145/3013496.

Niloufar Salehi et al. “We Are Dynamo: Overcoming Stalling and Friction in Collective Action for Crowd Workers”. In: *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. CHI ’15. ACM, 2015, pp. 1621–1630. ISBN: 978–1-4503–3145–6. DOI: 10.1145/2702123.2702508. URL: http://doi.acm.org/10.1145/2702123.2702508.

Ryo Suzuki et al. “Atelier: Repurposing Expert Crowdsourcing Tasks As Micro–internships”. In: *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. CHI ’16. ACM, 2016, pp. 2645–2656. ISBN: 978–1-4503–3362–7. DOI:

10.1145/2858036.2858121. URL: http://doi.acm.org/10.1145/2858036.2858121.

Susan Wyche, Phoebe Sengers, and Rebecca E. Grinter. “Historical Analysis: Using the Past to Design the Future”. In: *UbiComp 2006: Ubiquitous Computing: 8th International Conference, UbiComp 2006 Orange County, CA, USA, September 17-21, 2006 Proceedings*. Ed. by Paul Dourish and Adrian Friday. Berlin, Heidelberg: Springer Berlin Heidelberg, 2006, pp. 35–51. ISBN: 978-3-540-39635-2. DOI: 10.1007/11853565_3. URL: http://dx.doi.org/10.1007/11853565_3.

Lixiu Yu, Aniket Kittur, and Robert E. Kraut. “Encouraging “Outside- The- Box” Thinking in Crowd Innovation Through Identifying Domains of Expertise”. In: *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work &*

Social Computing. CSCW '16. San Francisco, California, USA: ACM, 2016, pp. 1214–1222. ISBN: 978-1-4503-3592-8. DOI: 10.1145/2818048.2820025. URL: http://doi.acm.org/10.1145/2818048.2820025.

Alvin Yuan et al. "Almost an Expert: The Effects of Rubrics and Expertise on Perceived Value of Crowdsourced Design Critiques". In: *Proceedings of the 19th ACM Conference on Computer–Supported Cooperative Work & Social Computing*. CSCW '16. ACM, 2016, pp. 1005–1017. ISBN: 978–1-4503–3592–8. DOI: 10.1145/2818048.2819953. URL: http://doi.acm.org/10.1145/2818048.2819953.