Human Language Technology Research Institute Colloquium

"The Rise of Crowd Computing"

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Abstract

Global growth in Internet connectivity and participation is driving a renaissance in human computation: use of people rather than machines to perform certain computations for which human competency continues to exceed that of state-of-the-art algorithms (e.g. AI-hard tasks such as interpreting text or images). Just as cloud computing now enables us to harness vast Internet computing resources on demand, crowdsourcing lets us similarly call upon the online crowd to manually perform human computation tasks on-demand. As crowd computing expands traditional accuracy-time-cost tradeoffs associated with purely-automated approaches, the potential to achieve these enhanced capabilities has begun to change how we design and implement our computing systems. While early work in crowd computing has focused on generating more data to train automated systems, we are increasingly seeing a new form of hybrid, socio-computational system emerge which harnesses collective intelligence of the crowd in concert with automation at run-time to better tackle difficult processing tasks. As such, we find ourselves today in an exciting new design space, where the potential capabilities of tomorrow's computing systems is seemingly limited only by our imagination and creativity in designing new algorithms to compute with crowds as well as silicon.

Use of human computers naturally poses a variety of new challenges, such as incentivizing participation, managing non-determinism, and implementing quality assurance mechanisms. While the human-computer interaction (HCI) community has a long history of considering human-centered computing issues, crowd-based system architecture poses distinct challenges vs. traditional user-centered design. The exciting potential of crowd computing has also attracted the interest of many researchers and practitioners from outside the HCI-community, who now find themselves confronting a range of practical HCI issues. In the bigger picture, placing people at the center of this new computing frontier introduces a range of important economic, social, ethical, and legal questions. We must therefore find effective methods for balancing issues of compliance and fairness alongside competing concerns of efficiency and accuracy.

Biography

Dr. Matthew Lease is an Assistant Professor in the School of Information at the University of Texas at Austin. He earned his Ph.D. in Computer Science from Brown University. His research centers on information retrieval, crowd computing, and their intersection. He has published a variety of related research papers, organized a variety of related research workshops and the ongoing Crowdsourcing Track at U.S. National Institute of Standards and Technology (NIST) Text REtrieval Conference (TREC), and created one of the first graduate-level seminars on crowdsourcing.

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