



Collective Solutions to Societal Problems

What

Human Computation Institute (HCI) is a non-profit innovation center that advances the *science of scalable crowd-power* to tackle hard societal problems.

How

Advancing research at the intersection of crowdsourcing, citizen science, and collective intelligence affords new opportunities for problem solving at unprecedented scales. For deeper insights and broader impacts, please read this article: "[Human Computation and Convergence](#)" (links directly to PDF file)

Who

A worldwide network of human computation researchers, multidisciplinary domain experts, and real world implementers.

Applications

Current Projects

Accelerating Alzheimer's disease research (eyesonalz.com) – allows the general public to help analyze Alzheimer's disease research data by playing an online game, accelerating treatment discovery by a factor of 30. Funded by the BrightFocus Foundation. Public version to be released October 2016.

EyesOnALZ is featured in the NSF-supported THE CROWD & THE CLOUD 4-hour series on citizen science, crowdsourcing and Big Data, appearing on public TV in early 2017. For more info see crowdandcloud.org.

In the Works

Crowdsourcing Electronic Medical Record (EMR) interoperability - allow end-users of EMR systems to map relevant patient information across systems as they retrieve what they need, and pave the path for the next user, as such making complete patient histories easily accessible to physicians. Under development.

Research

Participation

- What are the incentives that will attract and sustain a sufficient population of participants to ensure a significant impact on the problem at hand?
- What are the most effective mappings between incentive models and project types to increase participation and effort?

Analysis

- How can the mechanisms that underlie individual behavior be revealed by online activity traces, and what useful information can be derived from collective behavior?
- How can the analysis of emergent collective behavior help inform design of human computation systems?

Architecture

- Which workflow designs will enable effective information ecosystems?
- Which crowdsourcing approaches are best suited to which problems?
- Given the variability of human behavior, what can we assert about the expected performance characteristics of a system

Design Methods

- What is the optimal division of labor between machines and humans that will result in specific capability?
- What safeguards are needed to protect the system from malicious behavior?
- How can expertise among participants be identified and leveraged?

Infrastructure

- How do we build development environments that allow us to write, test, execute, and reuse code that operates on distributed human/machine systems?
- How can we simulate human behavior to reduce testing costs
- How do we enable always-on, asynchronous human participation?

Brief history

In 2013 a multidisciplinary community came together to collaborate on a [Handbook of Human Computation](#), to collect foundational material and begin to catalog the existing methods. Since then, the *Human Computation journal* was launched to provide ongoing cross-disciplinary communication on the topic. In 2014, we held a national [summit](#) with White House participation, to create a national research [roadmap](#) that leads to transformative capabilities that benefit society. [Human Computation Institute](#) was launched in response, to allow collaboration of scientists across borders and disciplines. The new perspective article in the January 1, 2016 issue of Science reaches out to our colleagues in the broader scientific community.