



Purdue Fall 2018

CS59000-CSC: Crowdsourcing and Social Computing
<http://mingyin.org/CS590/Fall2018/index.html>

Class 2: Crowdsourcing Background & Applications

2018.8.22

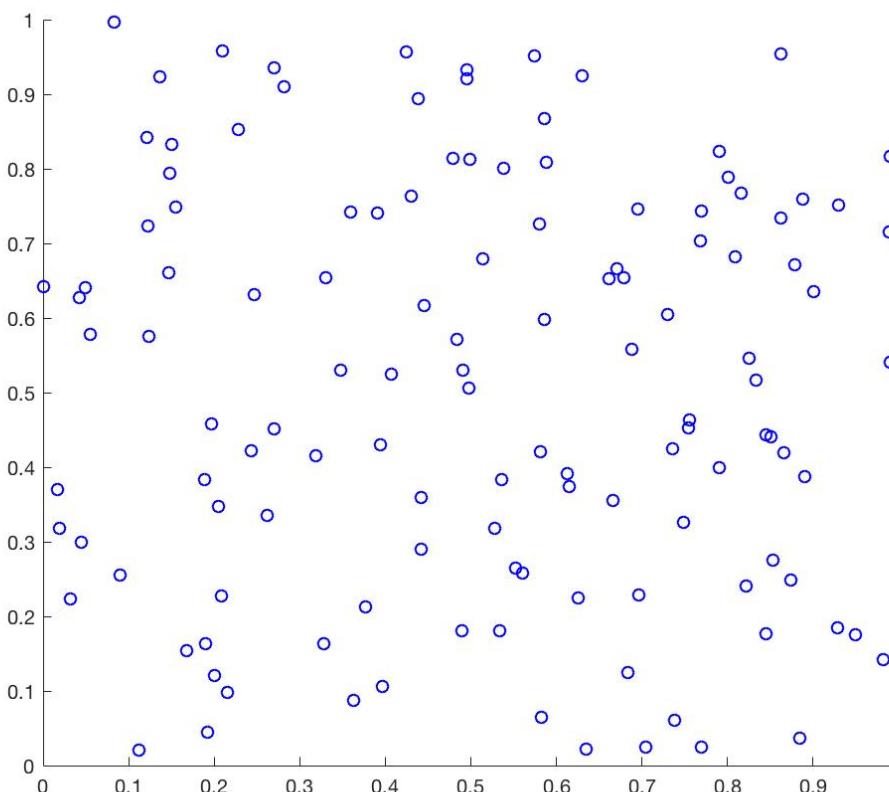
Ming Yin

Administrative notes

- Sign up for Piazza: <https://piazza.com/purdue/fall2018/cs59000csc/home>
- First reading response due 11:59pm Aug 26
- Sign up as a worker on Amazon Mechanical Turk or Figure Eight!
- First assignment due 11:59pm Aug 26 (will come back to this)

Let's start by playing a game

How many circles are there in the figure below?



The Wisdom of Crowds



- ~800 people at a county fair guessed the weight of an ox
- The average guess is 1,197lbs, and the true answer is 1,198lbs.
- The average guess is better than any single person's guess.

A NEW YORK TIMES BUSINESS BESTSELLER
"As entertaining and thought-provoking as *The Tipping Point* by Malcolm Gladwell. . . . *The Wisdom of Crowds* ranges far and wide."
—The Boston Globe

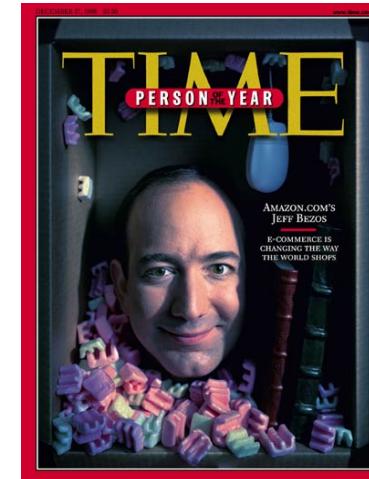
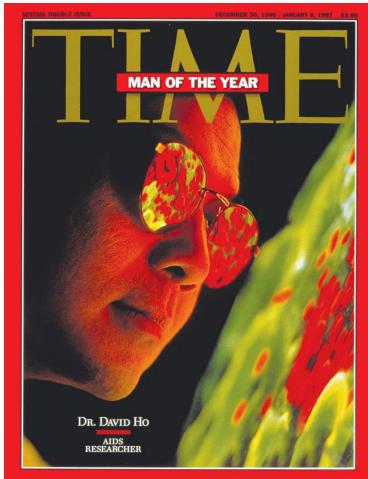
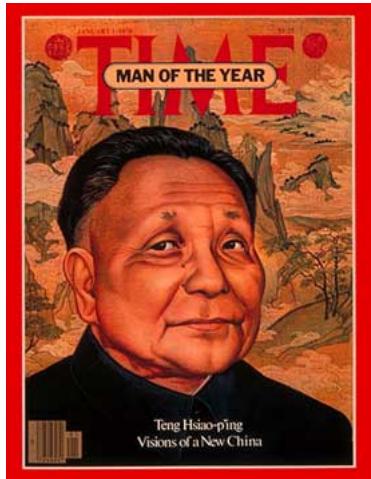
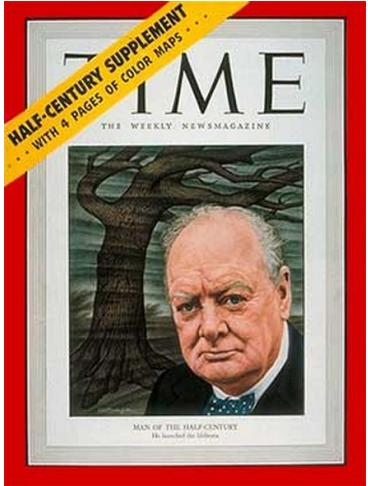
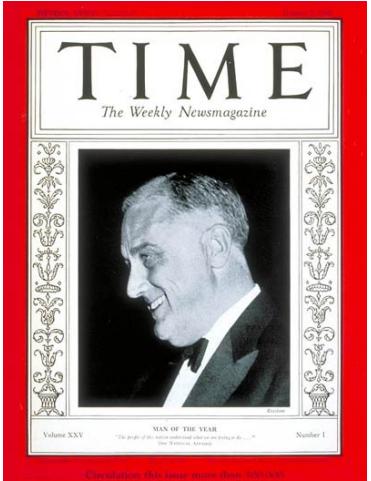
**THE WISDOM
OF CROWDS**
**JAMES
SUROWIECKI**

WITH A NEW AFTERWORD BY THE AUTHOR

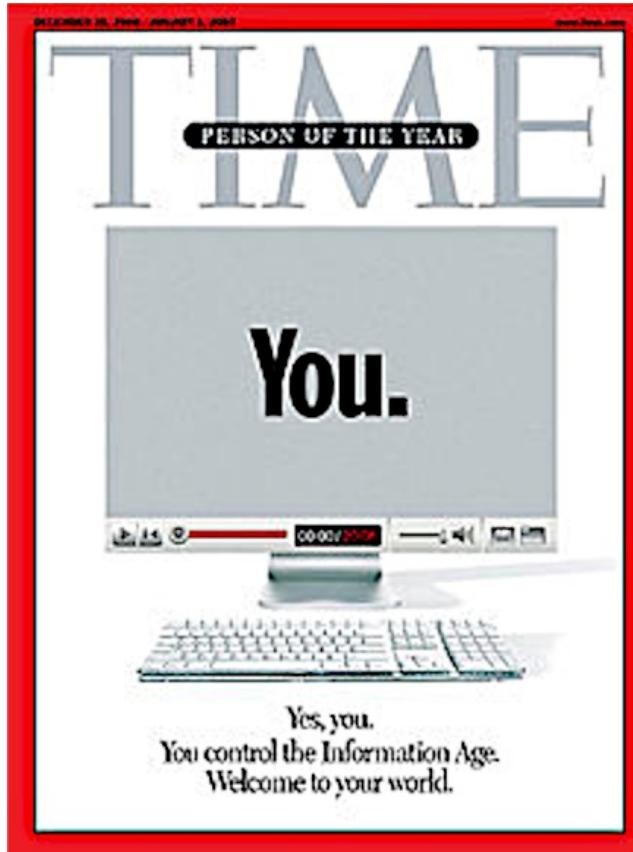


Crowds are smart, but it's also hard to bring together a large crowd...

Time Person of the Year

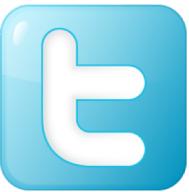


Time Person of the Year 2006



>4 Billion Internet users worldwide as of 2018!
21% of Americans go online almost constantly!

The Rise of Social Computing



Connect



Create



Share



Collaborate

WIRED



“Crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. ”

--- Jeff Howe

Various Types of Crowdsourcing Applications

- Implicit Crowdsourcing: Games with a Purpose
- Implicit Crowdsourcing: Duolingo
- Citizen Science Projects
- Crowdsourcing Contests
- Crowdfunding
- Crowdsensing
- Online Crowdsourcing Market
- ...

Games with a Purpose

ESP Game: Crowdsource image labeling via games



boy
white
black
window
wall

...

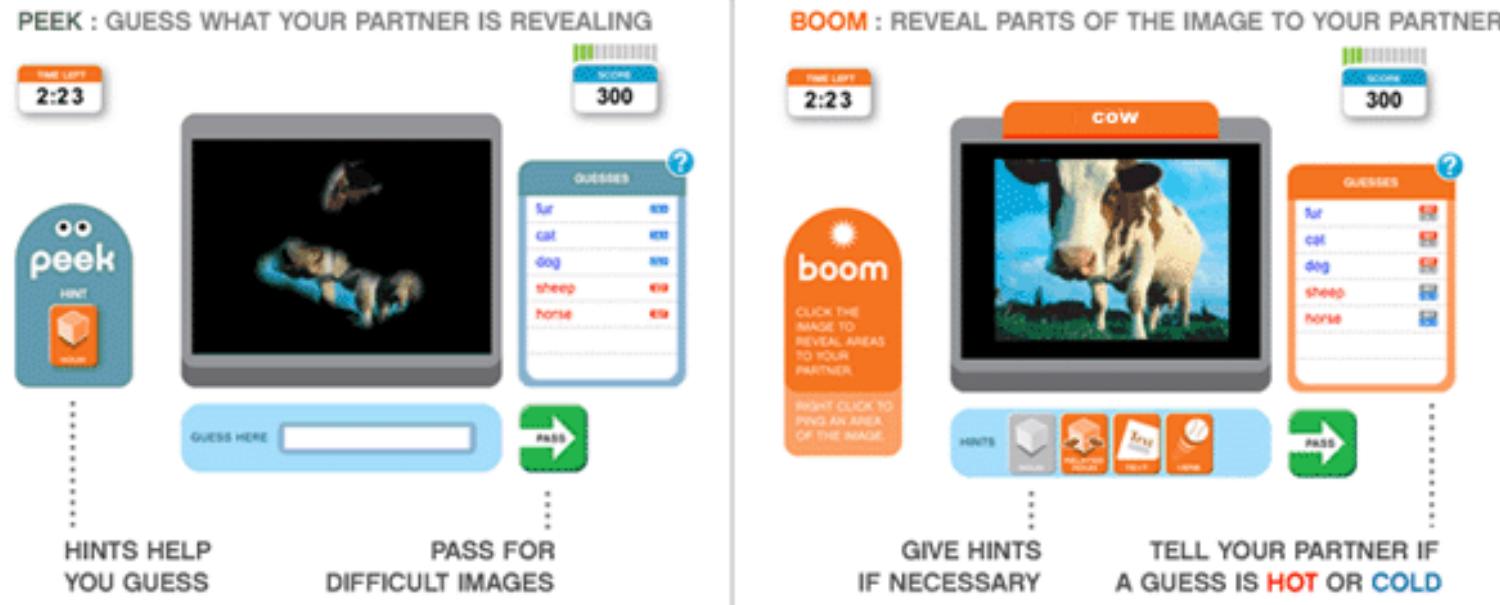


playground
children
running
boy

...

Potential Label: Boy

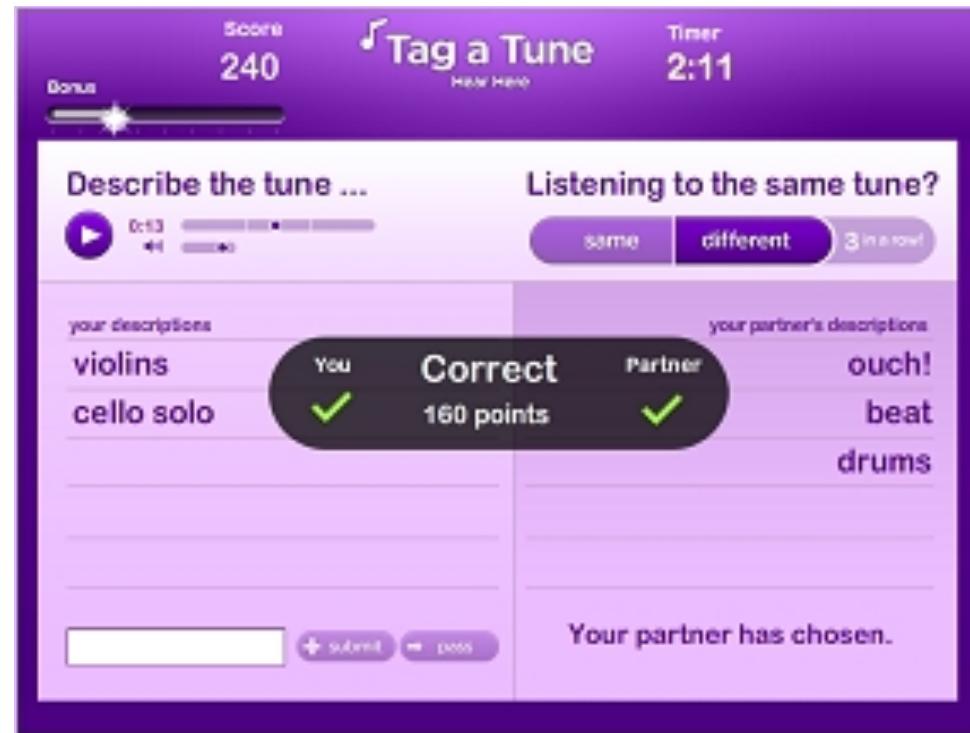
Games with a Purpose



Peekaboom: Crowdsource image segmentation via games

von Ahn et al. [Peekaboom: A game for locating objects in images](#). CHI'06

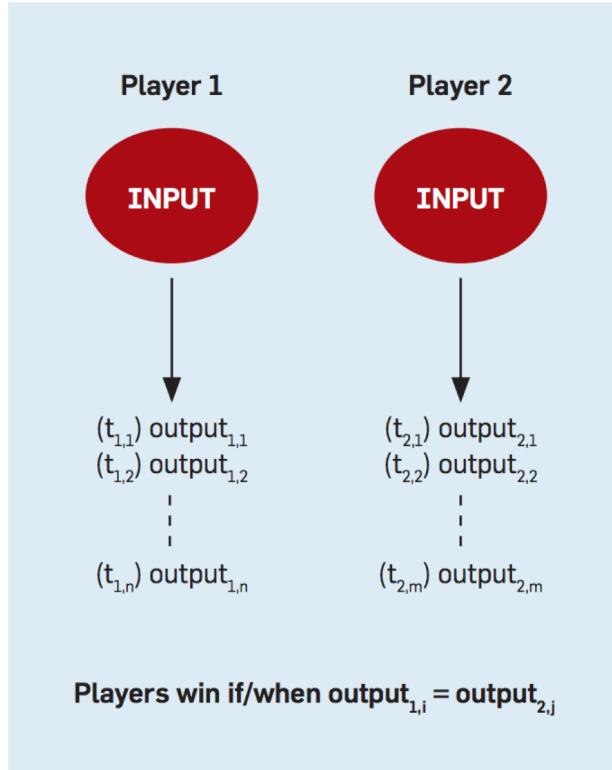
Games with a Purpose



TagATune: Crowdsource audio annotation via games

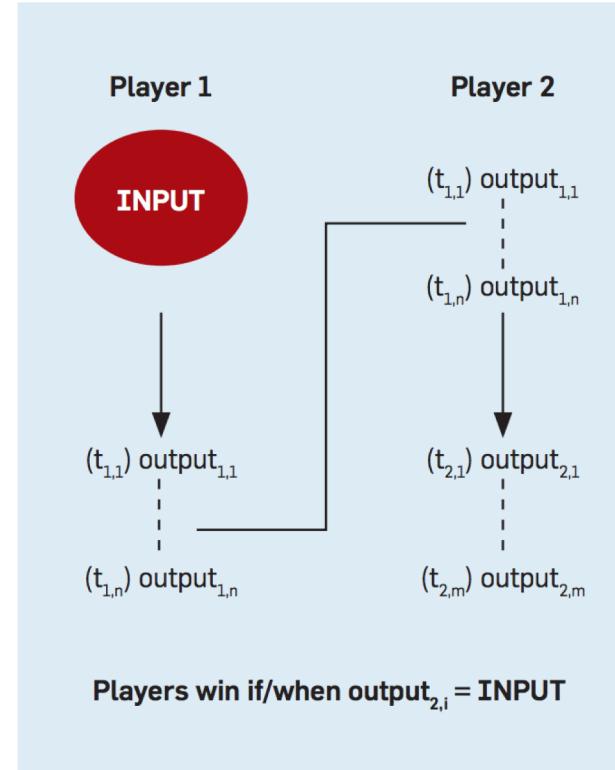
Law et al. [TagATune: A Game for Music and Sound Annotation](#). ISMIR'07

Games with a Purpose: General Pattern



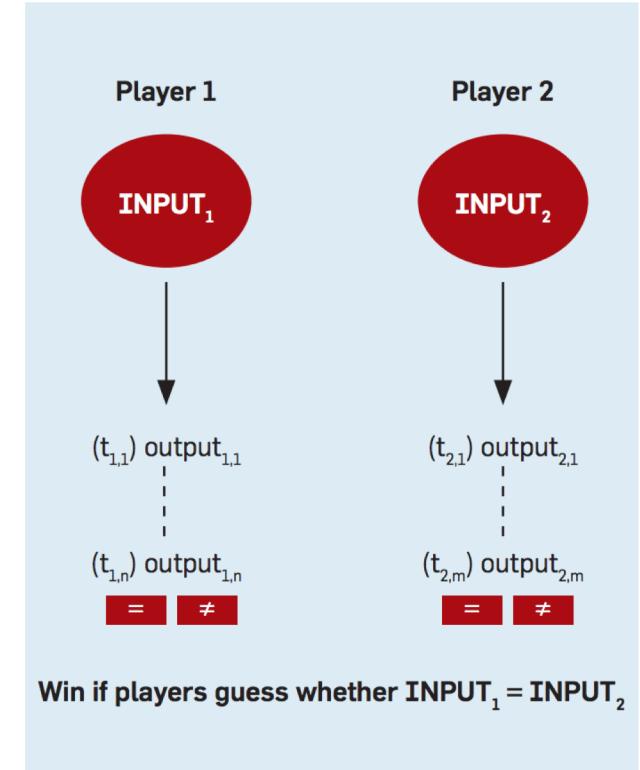
Output Agreement

e.g., ESP game



Inversion Problem

e.g., PeekABoom



Input Agreement

e.g., TagATune

Duolingo: Crowdsourcing via Learning

The image displays three screenshots of the Duolingo mobile application interface, illustrating its features and user interface design.

Screenshot 1: Home Screen (French Course)

This screen shows the main course selection area. At the top, there are navigation links: < Courses, French, and Profile. Below this, the "French" course is selected, indicated by a blue background. The course structure is as follows:

- Basics:** Represented by a blue egg icon. Progress: 100% (yellow bar).
- Basics 2:** Represented by a red chick icon. Progress: 2/5 (orange bar).
- Phrases:** Represented by a green speech bubble icon. Progress: 0/5 (grey bar).
- Animals:** Represented by a grey whale icon.
- Food:** Represented by a grey burger icon.
- Verbs:** Represented by a grey person icon.

At the bottom, there are three navigation icons: Brain (Learn), Two people (Duel), and Store (Shop). The "Learn" icon is highlighted in blue, indicating it is the active section.

Screenshot 2: Progress Report

This screen provides a summary of the user's progress. It includes:

- A weekly progress bar showing days M, T, W, T, F. Days M, T, W, and T are green, while F is orange.
- DAILY GOAL:** 15 XP OF 30 (with a wrench icon).
- A large circular progress meter labeled **LEVEL 2**.
- NEXT LEVEL:** 150 XP OF 600.

At the bottom are two large green buttons: **DONE** and **CHECK**.

Screenshot 3: Translation Task

This screen shows a translation task. It includes:

- QUIT** button and three red hearts.
- A progress bar with several green segments.
- Translate this sentence:** La fille **mange** une pomme.
- A text input field with placeholder **Type answer here**.
- CHECK** button at the bottom.

Citizen Science Projects



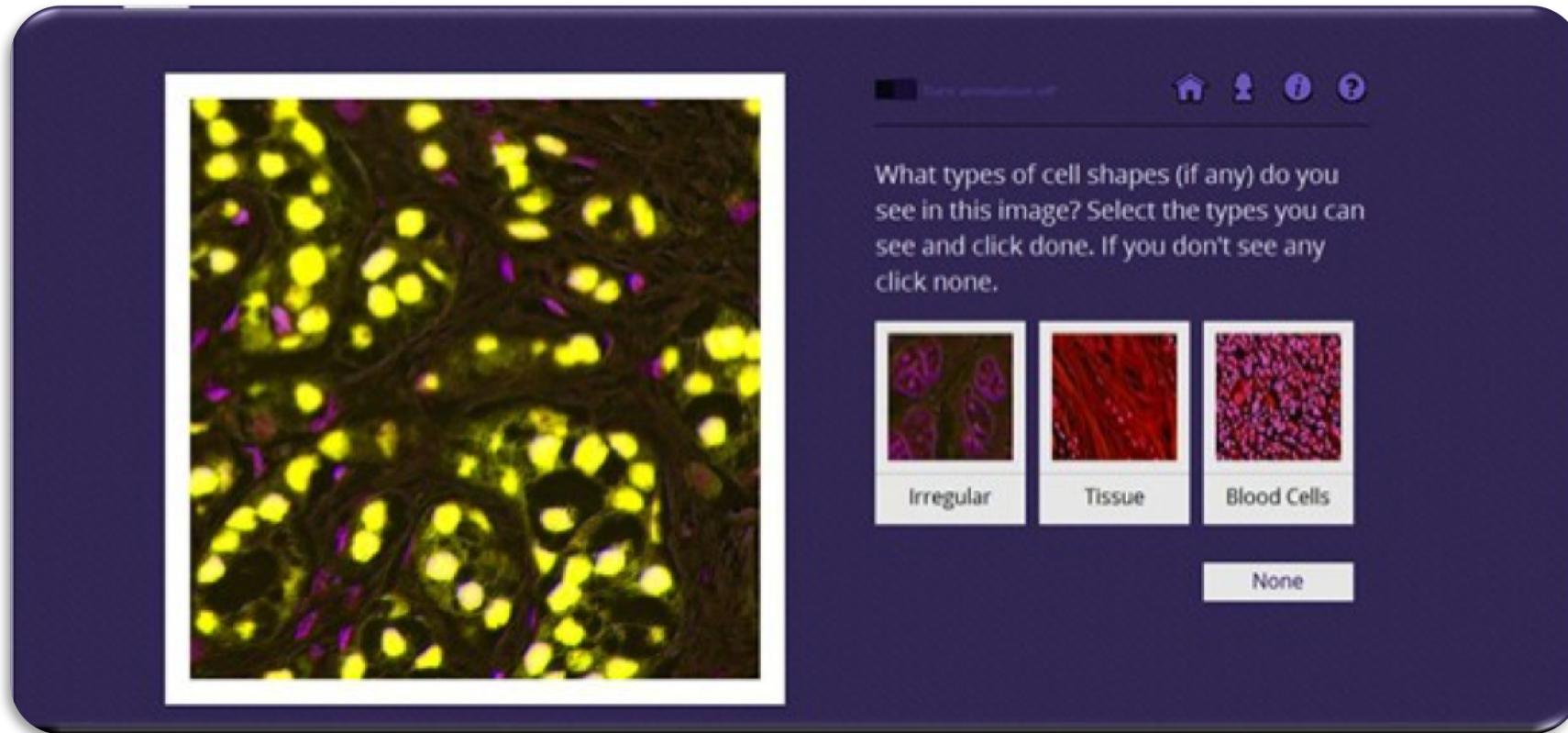
FoldIt: Online video game for protein folding

2011: decipher the crystal structure of an AIDS-related virus

2012: The first crowdsourced redesign of a protein

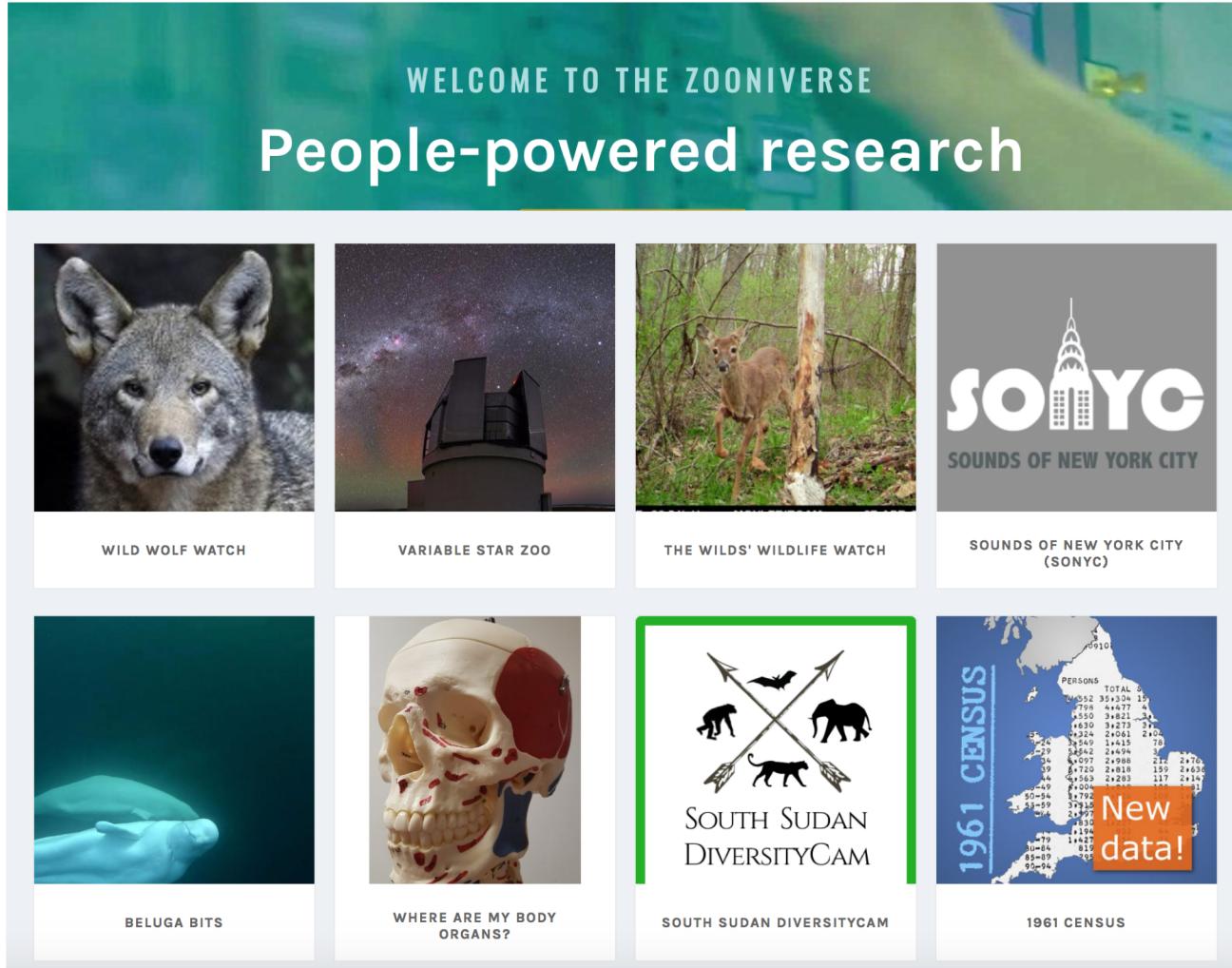
Cooper et al. [Predicting Protein Structures with a Multiplayer Online Game](#). Nature, August 2010

Citizen Science Projects



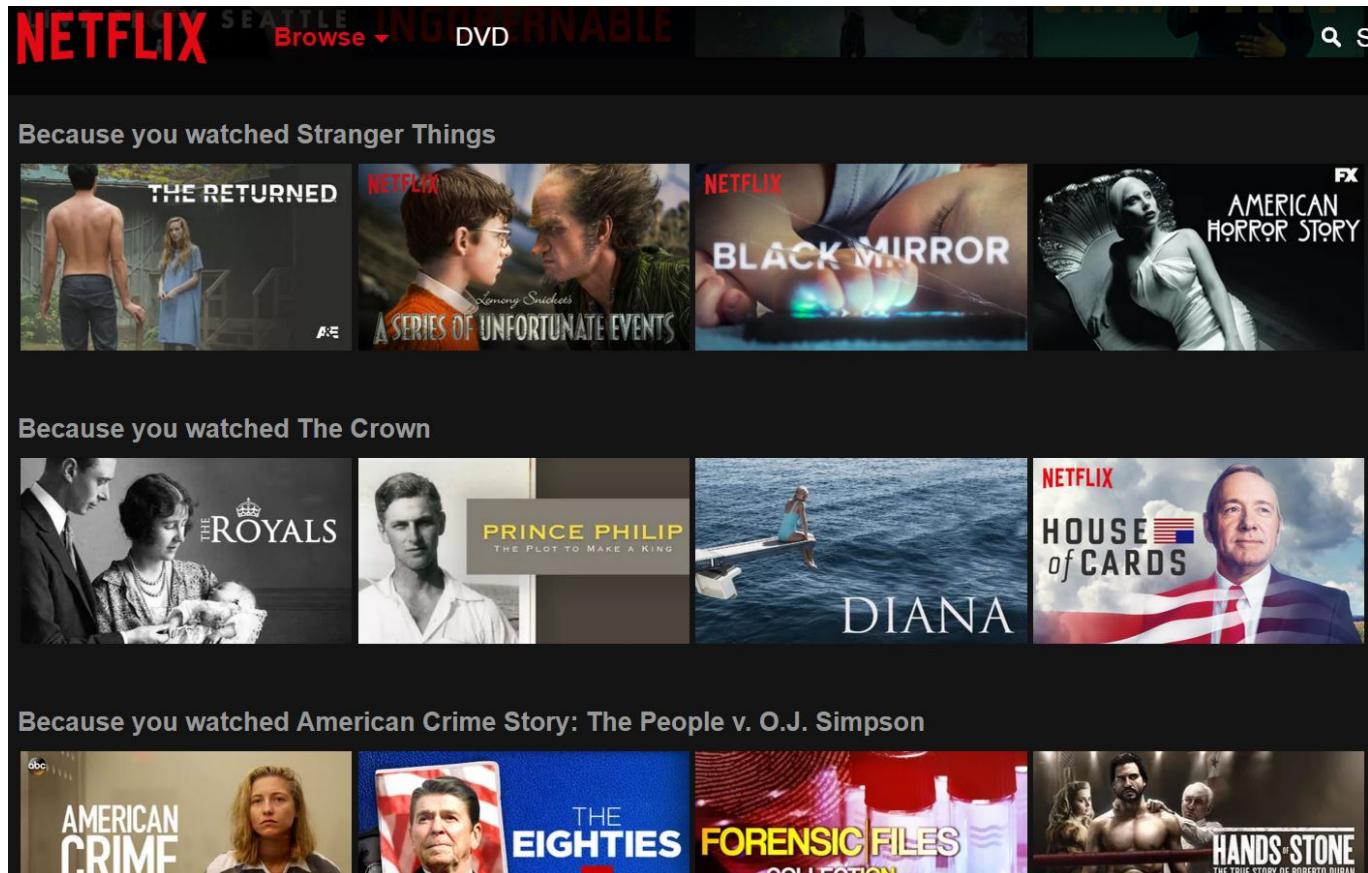
Cell Slider: Examine tumor tissue samples and spotting cancerous cells

Citizen Science Projects



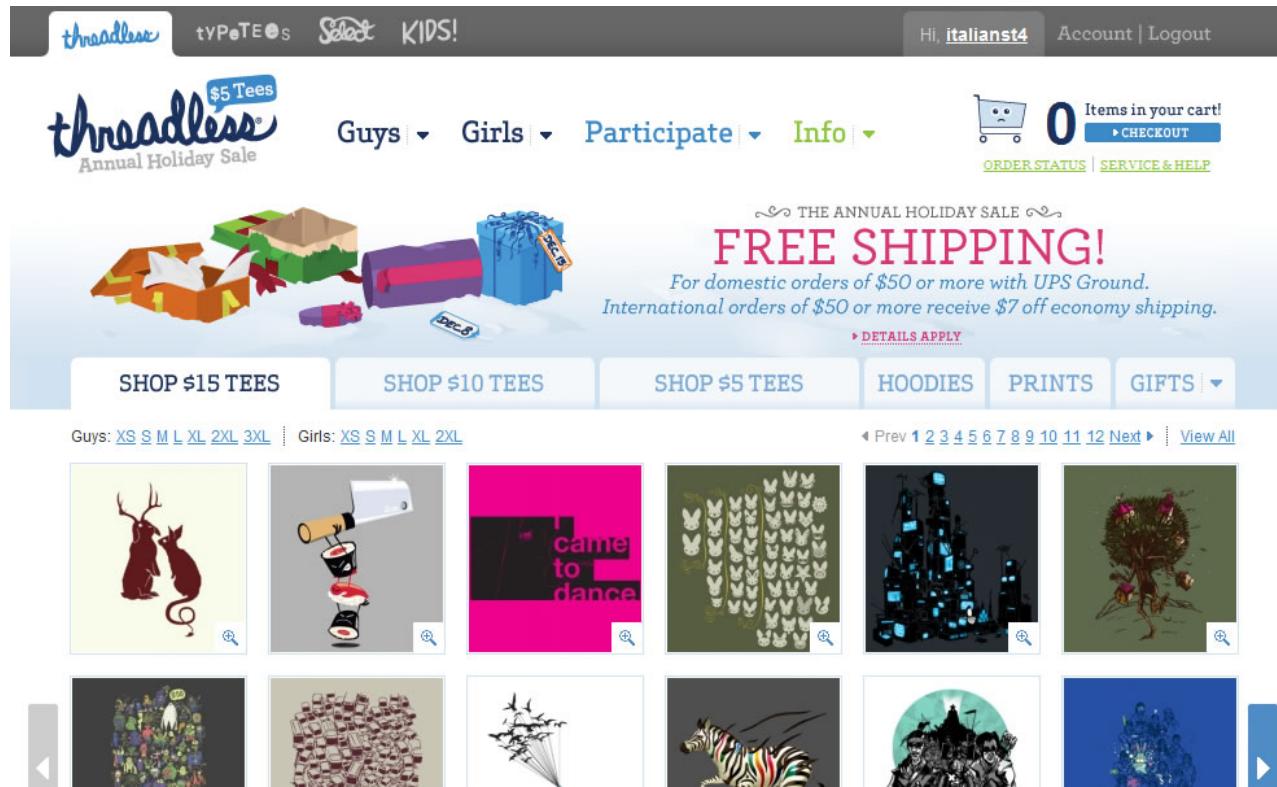
Zooniverse: A citizen science web portal

Crowdsourcing Contests



- Netflix Prize, 2006
- 44,014 submissions
- The best solution improved its recommendation engine's performance by 10%
- crowdsourcing within a crowdsourcing competition

Crowdsourcing Contests



- Threadless
- Crowds generate the design
- Crowds vote on the design
- 438,451 designs submitted, 8,805 printed

Crowdsourcing Contests



Detecting Leaks and Flaws in Water Pipelines – Stage 1

TAGS: Chemistry Engineering/Design Physical Sciences Water Theoretical-licensing

Award: \$75,000 USD

Active Solvers: 294

Challenge ID: 9933883

STATUS: Under Eval

Posted: Mar 08 2018

Share Team

PREMIUM CHALLENGE

Abstract

The Bureau of Reclamation and its collaborators are seeking innovative methods and technology to detect leaks and flaws in buried water pipeline infrastructure. Pipeline leaks and flaws deprive consumers of a valuable resource and necessitate costly repairs. Currently, no practical method exists to detect leaks and flaws in large diameter operational pipelines regardless of pipe diameter and material type. Solutions can be novel approaches or can build upon existing methods or technologies. This Challenge launches Stage 1 of a planned two-stage Challenge that includes laboratory-scale and field-scale demonstrations.

Challenge Orientation Video: Subject matter experts from Reclamation, San Diego County Water Authority, and Southern Nevada Water Authority discuss the need for improved pipeline leak detection methods.

PRIVACY ADVISORY

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- Innocentive
- Crowdsourcing problem-solving
- 2000+ problems, 380,000+ solvers
- Problems are supplied by corporations, governments, non-profits, etc.

Crowdfunding

Explore Start a project

KICKSTARTER

Search  Sign in



By Pillar Learning
First created

Codi: Interactive smart storyteller toy for kids

Using hundreds of songs, stories and lessons, Codi provides developmental support for your kids outside of the classroom



\$15,393

pledged of \$35,000 goal

162

backers

31

days to go

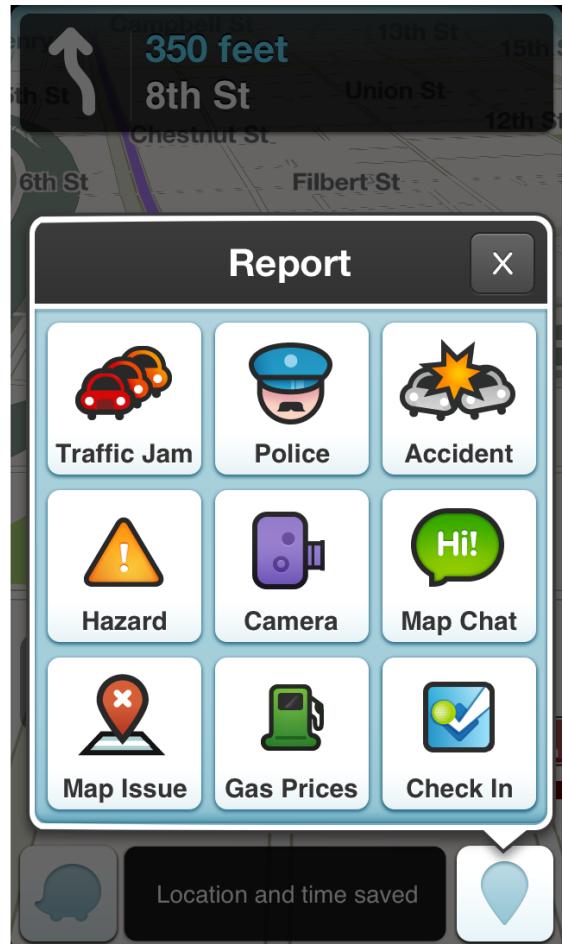
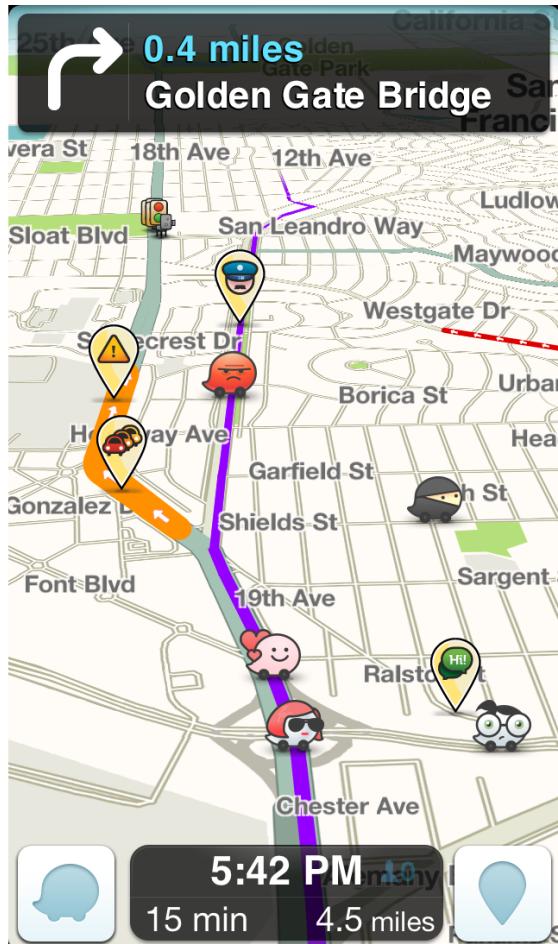
Back this project

 Remind me

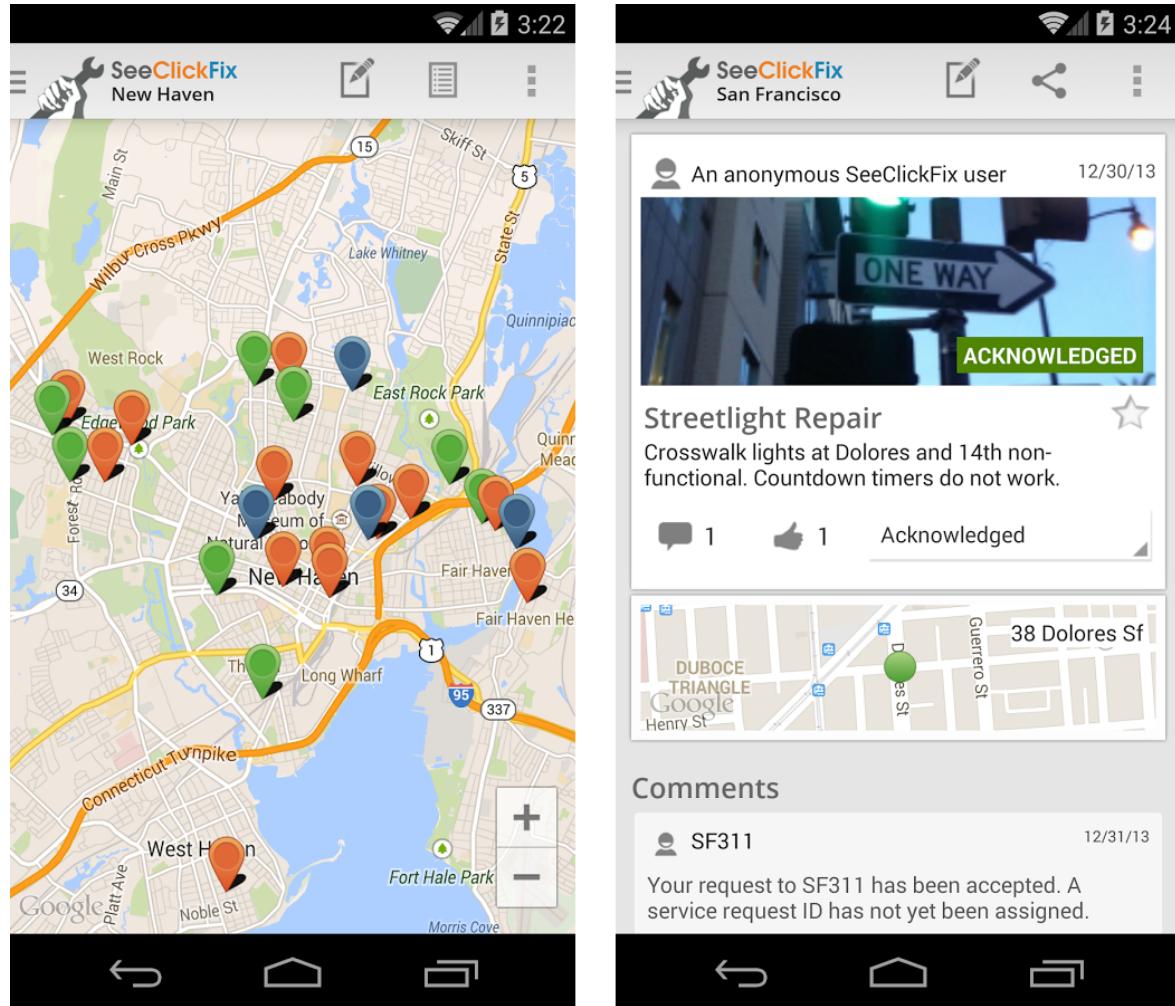


All or nothing. This project will only be funded if it reaches its goal by Tue, September 18 2018 11:04 AM EDT.

Crowdsensing: Waze



Crowdsourcing: SeeClickFix



The image displays two screenshots of the SeeClickFix mobile application. The left screenshot shows a map of New Haven, Connecticut, with numerous location markers (green and orange pins) scattered across the city, indicating various reported issues. The right screenshot shows a specific report from San Francisco, featuring a photo of a street sign that reads "ONE WAY". The report is titled "Streetlight Repair" and describes crosswalk lights at Dolores and 14th that are non-functional. It includes a map showing the location in the Duboce Triangle area and a comment from user SF311 stating that their request has been accepted.

Online Crowdsourcing Markets

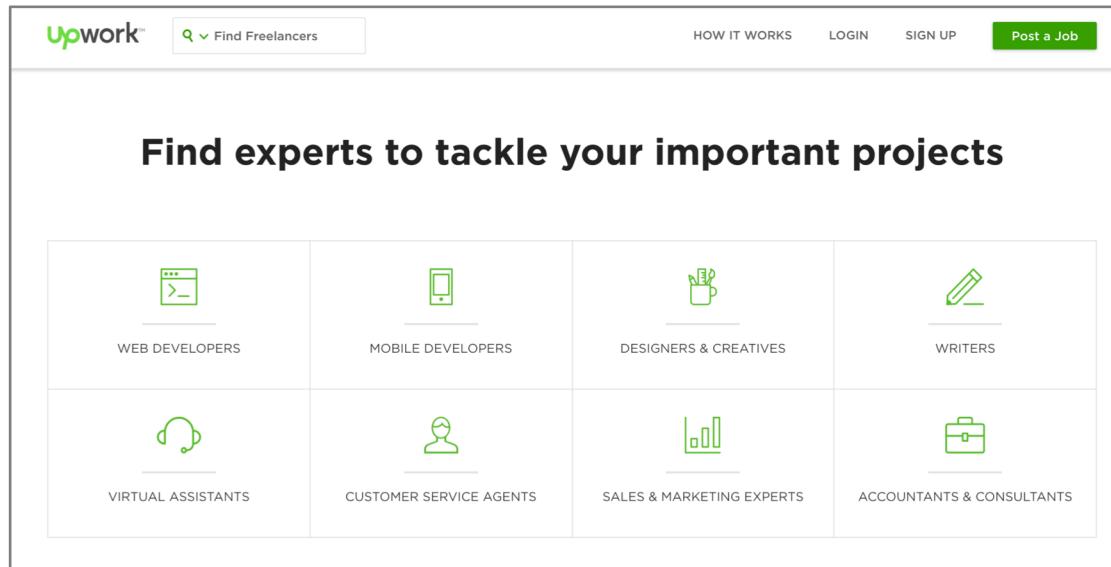


The image shows a screenshot of the Amazon Mechanical Turk (MTurk) worker interface. On the left, there's a cartoon illustration of a man with a beard and glasses pointing towards the screen. On the right, there's another illustration of a grid of six diverse human faces. The MTurk interface itself has a blue header with the logo and navigation links: 'HITs', 'Dashboard', 'Qualifications'. Below the header is a search bar and a 'Filter' button. The main content area is titled 'HIT Groups (1-20 of 925)' and displays a table of HITs. The columns include 'Requester', 'Title', 'HITS', 'Reward', 'Created', and 'Actions'. Some actions like 'Preview' and 'Accept & Work' are highlighted in orange. The table lists various HITs from requesters like 'Chris Richmond', 'James Billings', and 'Crowdsurf Support'.

Requester	Title	HITS	Reward	Created	Actions
Chris Richmond	Search the entire website for a contact email address or form. Please also incl...	14,925	\$0.05	1d ago	Preview Qualify
James Billings	Market Research Survey	9,379	\$0.01	2m ago	Preview Accept & Work
Crowdsurf Support	Transcribe up to 35 Seconds of Media to Text - Earn up to \$0.17 per HIT!!	7,592	\$0.05	5m ago	Preview Qualify
NEL Research	Watch a 15-30 second video and share your opinions!	6,916	\$0.25	3m ago	Preview Accept & Work
Amazon Requester Inc - Core lv	Indicate whether you will 1. buy one at Amazon if the other one is unavailable. ...	4,174	\$0.10	6d ago	Preview Qualify
Job Spotter	Collect store information of a hiring sign (WARNING: This HIT may contain adu...	3,546	\$0.05	2m ago	Preview Qualify
Vladimir	Choose correct Google Taxonomy category given product description	3,261	\$0.10	4d ago	Preview Qualify
Musicbed	Categorization Filtering for Film and Video Clips - Form 1	3,137	\$0.09	7h ago	Preview Qualify
KronoPin	Find the Website Address for a Consumer Product	2,817	\$0.05	15d ago	Preview Qualify
WatchFlower Systems	Find info from an email v1	2,556	\$0.03	1h ago	Preview Qualify
Chris Richmond	Search the entire website for a contact email address or form. Please also incl...	2,176	\$0.05	8h ago	Preview Qualify

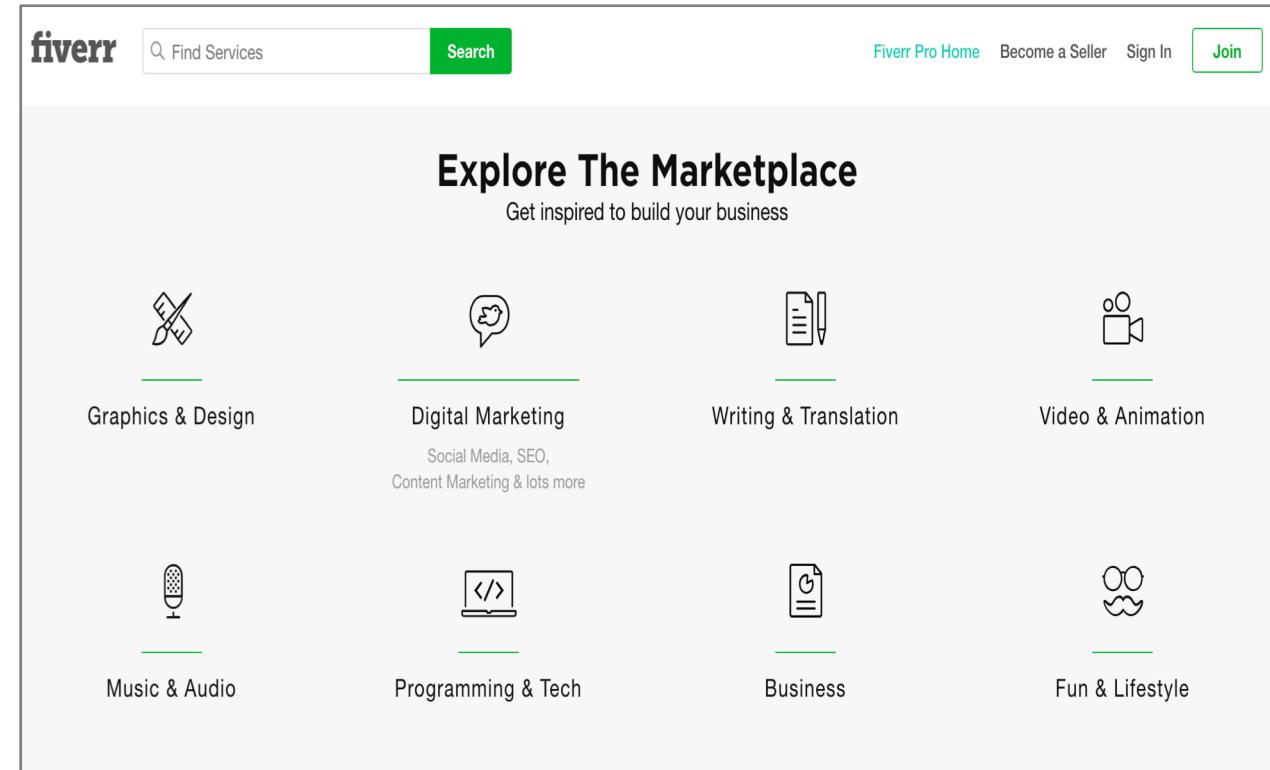
Microtask platform, e.g., Amazon Mechanical Turk

Online Crowdsourcing Markets



The Upwork homepage features a navigation bar with 'Find Freelancers' and buttons for 'HOW IT WORKS', 'LOGIN', 'SIGN UP', and 'Post a Job'. Below this, a main heading says 'Find experts to tackle your important projects'. A grid of eight service categories is shown:

WEB DEVELOPERS	MOBILE DEVELOPERS	DESIGNERS & CREATIVES	WRITERS
VIRTUAL ASSISTANTS	CUSTOMER SERVICE AGENTS	SALES & MARKETING EXPERTS	ACCOUNTANTS & CONSULTANTS



The Fiverr homepage has a search bar with 'Find Services' and a 'Search' button. It includes links for 'Fiverr Pro Home', 'Become a Seller', 'Sign In', and 'Join'. A main section titled 'Explore The Marketplace' with the subtext 'Get inspired to build your business' lists ten service categories:

Graphics & Design	Digital Marketing	Writing & Translation	Video & Animation
Music & Audio	Programming & Tech	Business	Fun & Lifestyle

Freelance markets, e.g., Upwork, Fiverr

The Crowd's Role

- Contributors of basic human intelligence
- Contributors of expertise/talents/skills
- Contributors of opinion
- Contributors of location-related information
- Contributors of money
- ...

Discussion

- Can you think of some other examples of crowdsourcing applications?
- What are some examples of challenging tasks in your daily life? Do you think the crowd can help with your challenging tasks? Why or why not?

Assignment 1

- Assignment 1 is out; check the course website to get it
- Earn \$0.25 as a crowd worker! (through Amazon Mechanical Turk or Figure Eight)
- Submit it to course email: crowdsourcing.purdue@gmail.com
- Due Aug 26, 11:59pm

Next Class

- Crowd workers
- Required Reading:
 - Martin et al. [Being a Turker](#). CSCW'14
 - Yin et al. [The Communication Network Within the Crowd](#). WWW'16
- Optional Reading:
 - Gray et al. [The Crowd is a Collaborative Network](#). CSCW'16
 - Difallah et al. [Demographics and Dynamics of Mechanical Turk Workers](#). WSDM'18
- Check reading questions on Piazza; due on Aug 26, 11:59pm