In today's tutorial we focus mainly on

amazon mechanical turk™
Artificial Artificial Intelligence

CrowdFlower

Catarse
united prosperity
TenPages.com
trampoline
needs
SYMBID
wegetthere
REVENUE TRADES
trustBuddy
peerform
isePankur
CROWDFUNDER
AFRICA UNSIGNED.COM
myC4
RocketHub
Funding Circle
akvo.org
Startup ADDICT
40Billion.com
citizen effect
c-crowd
Finance Utile
INDIEGOGO
fundchange
CFF
GreenNote
crowdcube
MicroVentures
KICKSTARTER
Injoinet
cashare
SELLABAND
kachingle
CHARGEABLE TV
appback
crowdrise
innovators
SEEDUPS
Spot.us
STARDUST @ HOME
HARO
GALAXY ZOO
ChaCha
trend watching.com
OpenBuildings
intrade
CureTogether
CNN iReport
reddit
COLLEGE PROWLER
VENCORPS
HSX
Brownbook.net
Vuuby
SodaHead
OrganizedWisdom
LUMENOGIC
TWELF FORCE
LeadVine
TOMTOM
crowdcast
ROOT Metrics
CONSENSUS POINT
beansight
ScalableWorkforce.com
ContentModerator.com
Skild
CrowdEngineering
CapAngel
Ideavibes
CrowdWorx
IQ Engines
BRIGHTIDEA
BIGDOOR
smartsheet
appswell
giveo
TUNEDIT
spigit
evly
kapost
myAzimia.org
wall
Ushahidi
IdeaScale
crowdtwist
growvc
wooshii
AD TOURNAMENT
jade magnet
ADHACK
iStockphoto
AudioDraft
brand potion
crowdSPRING
threadless
Lattoo
minted
ZOOPPA
Mypitch
GENERO.tv
99 designs
BY THE CITY FOR THE CITY
GIANT HYDRA
VICTORS & SPOILS
DESIGN
jovoto
MASS ANIMATION
PROVA
crowdbands
creativeallies
Logo DesignTeam
GeniusRocket
GLOBALLIVESproject
UTest
Elance
CloudCrowd
GRABCAD
liveops
oDesk
mygengo
freelancer
amazon mechanical turk
Artificial Artificial Intelligence
CrowdFlower
agentanything
crowd content
socialvibe
DeskLancer
servio
Boost
DESIGN RIDER
CAPSEO
samasource
SpeakerText
Truvell
guru
microtask
task us
DoNanza
Lingotek
expertplanet
MOB4HIRE
peopleperhour.com
Spaal Source
clickworker
PEER TO PATENT
agasauris
mediapiston
SuggestionBox.com
Improvement Starts Here
Crowd Together
THEBLOGTV
fashionstake
Kindling
mediabistro.com
get satisfaction
DAILY GROMMET
BzzAgent
E-Democracy.org
ecycler
our SAY
changemakers
engage4change
phillytreemap
nigo
care2
CRISIS mappers
AZRedistricting.com
change.org
IDEAnet
yet2.com
mutopo
chaordix
ideasculture
METAL 2.0
Fing
nosco
NETFLIX
eYeka
Nokia Beta Labs
innovationexchange
INNOCENTIVE
Unilever
redesignme.com
ideaken
atizo
100 Open
innovation CHALLENGE
idea bounty
ideaCONNECTION
innovaro
ChallengePost
ibridge
Why?

Classification System for Human Computation

- Motivation
- Quality Control
- Aggregation
- Human Skill
- Process Order
- Task-request Cardinality

Motivation

How can we motivate people to participate?

Even with a low barrier to entry (anyone with an computer can contribute) we still need to make a case **why** they should contribute.

Motivation: Pay

- Easiest way to recruit workers.
- Downside: provides incentive to cheat
- Problem might be exacerbated when the crowd workers are anonymous
- MTurk uses micropayments
- Online temping services provide higher wages: LiveOps, ODesk, etc
- CrowdFlower tried non-monetary payments (virtual goods and currencies, SwagBucks)

Motivation: Altruism

- People want to do good
- When Jim Gray went missing, volunteers searched 500k satellite images
- After the Haitian earthquake, diaspora translated 1000 messages per day

2010 Haitian Earthquake

Disaster Response

The maps are bad

Jan 12

Ushahidi

Robert Munro

Disaster Response

Better maps from Crowdsourcing

Jan 23

Ushahidi

Robert Munro

Disaster Response

The responders don't speak Kreyol

- Fanmi mwen nan Kafou, 24 Cote Plage, 41A bezwen manje ak dlo
- Moun kwense nan Sakre Kè nan Pòtoprens
- Ti ekipman Lopital General genyen yo paka minm fè 24 è
- Fanm gen tranche pou fè yon pitit nan Delmas 31

- My family in Carrefour, 24 Cote Plage,41A needs food and water
- People trapped in Sacred Heart Church, PauP
- General Hospital has less than 24 hrs. supplies
- Undergoing children delivery Delmas 31

Ushahidi

Robert Munro

LAYERS
Haiti 4636 Volunteers
message count
Canada
Bermuda
Island
Førgyar
Suomi
Latvija
España
Moldova
Казақстан
Монгол Улс
中国 (China)
Iran
India
Sri Lanka
Maldives
Philippines
Guam
Micronesia
Brunei Darussalam
Singapore
Indonesia
Papua New Guinea
Timor-Leste; Timor Lorosa'e
Australia
Cocos (Keeling) Islands
British Indian Ocean Territory
Tanzania
Burundi
Angola
Zambia
Mozambique
Botswana
Swaziland
Lesotho
Réunion
Tromelin Island
Glorioso Islands
Niger
Mali
Nigeria
Liberia
Guinée
Sénégal
Cameroon; Cameroun
Guinée équatoriale
Guinea Equatorial - Guinée Equatorial
Guatemala
Nicaragua
Panama
Venezuela
Barbados
Colombia
Guyane Française
Ecuador
Perú
Brasil
Bolivia
Paraguay
Chile
Uruguay
Île de Clipperton
Polynésie française
Pitcairn Islands

Motivation: Reputation

- Sometimes people will contribute in order to build their profile within a community
- Example: stackoverflow

stackoverflow

Questions | Tags | Tour | Users

Users

reputation | new us

Type to find users:

Gordon Linoff
New York, United States
1,260
sql, mysql, sql-server

Sotirios Delimanolis
1,020
java, spring, spring-mvc

Arun P Johny
Bangalore, India
960
jquery, javascript, html

Jon Skeet
Reading, United Kingdom
915
c#, java, .net

Hans Passant
Madison, WI
905
c#, .net, winforms

Martijn Pieters
Cambridge, United Kingdom
880
python, python-2.7, list

alecxe
Russia
870
python, django, scrapy

BalusC
Willemstad, Curaçao
855
java, jsf, jsf-2

dasblinkenlight
United States
825
c#, c++, java

falsetru
Seoul, South Korea
800
python, regex, ruby

VonC
France
780
git, eclipse, java

arshajii
Boston, MA
777
java, python, string

Motivation: Enjoyment

- Games with a purpose is a strategy to try to make a task fun
- In the ESP game two players look at an image and try to guess what words the other is thinking
- In doing so they label images on the web

score
100

ESP Game

Concentrate...

time
2:21

What do you see?

taboo words

peace

lay

guesses

sheeps...

sheep

submit

pass

duolingo

Home | Discussion | Immersion

Create a pro

Choose your path!

Beginners start at Basics 1.
Advanced learners take a short test.

Basics 1 OR Placement test

Phrases 0/3

Basics 2 0/4

Food 0/5

Animals 0/4

Plurals 0/1

Spanish progress

1 — 2

0 XP

0 Words

Create a profile to save your progress!

Create a profile

Log in

Follow Duolingo

90k | 300k | 70k

Luis Von Ahn

==

Tom Sawyer

Tom Sawyer (Whitewashing the Fence), 1936

Motivation: Implicit Work

- It is sometimes possible to make people do work alongside some other task

Motivation

- Pay
- Altruism
- Reputation
- Enjoyment
- Implicit Work
- **Can you think of others?**

Quality Control

Even if people are motivated to participate, how do we know that they are doing work conscientiously? Can we trust them not to cheat or sabotage the system? Even if they are acting in good faith, how do we know that they're doing things right?

Quality Control

- Reputation check
- Agreement and redundancy
- Gold standard + automatic reviewing
- Multi-level review
- Defensive task design
- Statistical filtering
- Economic incentives

Aggregation

Part of the process of human computation is to combine all contributions to solve a global problem. The class of problem may determine what strategy is best.

Aggregation

- Wisdom of Crowds
- Collection
- Search
- Iterative improvement
- None?

Human Skill

“Human Computation is a paradigm for utilizing human processing power to solve problems that computers cannot yet solve.”

–Luis von Ahn. Doctoral Thesis, 2005.

Human Skill

- Visual recognition
- Language understanding
- Translation
- Reasoning
- What other skills might be useful for human computation tasks?

Process order

- Three roles in Human Computation: Requester, Worker, Computer
- **Requester** is the end user who benefits from the computation
- **Worker** is the person performing the task
- **Computer** only comes into play when it plays a role in solving the problem (not just aggregating results or being the information channel)

Task-Request Cardinality

When a service is powered by human computation, many human workers may produce the result. Sometimes, just one or a few workers may suffice. The structure of the problem dictates the cardinality.

Task-Request Cardinality

- One-to-one: ChaCha question answering
- Many-to-many: Image labeling / search
- Many-to-one: Search for Jim Gray
- Few-to-one: VizWiz has a few people respond to each blind person’s query