

In today's tutorial we
focus mainly on





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 a 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



Disaster Response

Better maps from Crowdsourcing



Disaster Response

The responders don't speak Kreyol

- Fanmi mwen nan Kafou, 24 Cote Plage, 41A bezwen manje ak dlo • My family in Carrefour, 24 Cote Plage, 41A needs food and water
- Moun kwense nan Sakre Kè nan Pòtoprens • People trapped in Sacred Heart Church, PaUP
- Ti ekipman Lopital General genyen yo paka minm fè 24 è 24 hrs. supplies • General Hospital has less than 24 hrs. supplies
- Fanm gen tranche pou fè yon ptit nan Delmas 31 • Undergoing children delivery Delmas 31



Motivation: Reputation

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

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

[alecxex](#)

Russia

870

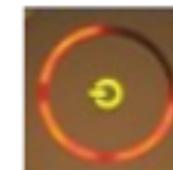
python, django, scrapy

[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

A text input field with a white background and a black border, containing a small portion of a mouse cursor icon.

+ submit

→ pass

Choose your path!

Beginners start at Basics 1.

Advanced learners take a short test.



Basics 1



Placement test

OR



Phrases 0/3



Basics 2 0/4



Food 0/5



Animals 0/4



Plurals 0/1

Spanish progress

1



0 XP

2

W

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

The Norwich line steamboat train, from New-London for Boston, this morning ran off the track seven miles north of New-London.



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