Human Computation

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What is Human Computation?

- **Human Computation** is a technique when a computational process performs its function via outsourcing certain steps to humans.

Why Human Computation?

- **Human Computation** leverages differences in abilities and alternative costs between humans and computer agents to achieve symbiotic human-computer interaction.

- Applicable to a large number of problems that are hard to solve by using traditional techniques
  - "When you have a hammer everything looks like a nail"

- The growth of Internet users

The ESP Game


ESP Game
Concentrate...
How to Play
1 You and a partner see the same image.
2 Each of you must guess what words your partner is typing.
make a ne
Tree
Got it, Let's Play!
View Top Scores

THE ESP GAME

TWO-PLAYER ONLINE GAME

PARTNERS DON'T KNOW EACH OTHER AND CAN'T COMMUNICATE

OBJECT OF THE GAME:
TYPE THE SAME WORD

THE ONLY THING IN COMMON IS AN IMAGE

THE ESP GAME

PLAYER 1

GUESSING: CAR

GUESSING: HAT

GUESSING: KID

SUCCESS!
YOU AGREE ON CAR

PLAYER 2

GUESSING: BOY

GUESSING: CAR

SUCCESS!
YOU AGREE ON CAR

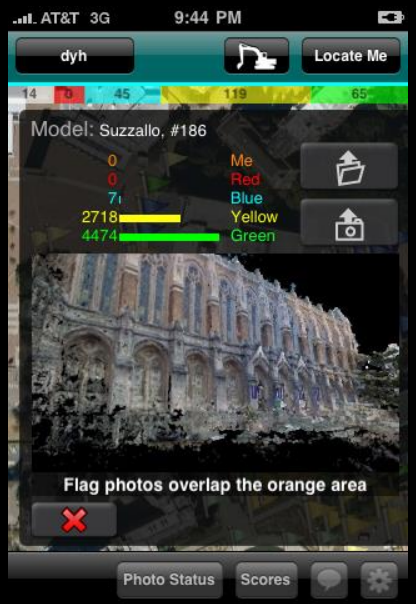
ReCAPTCHA

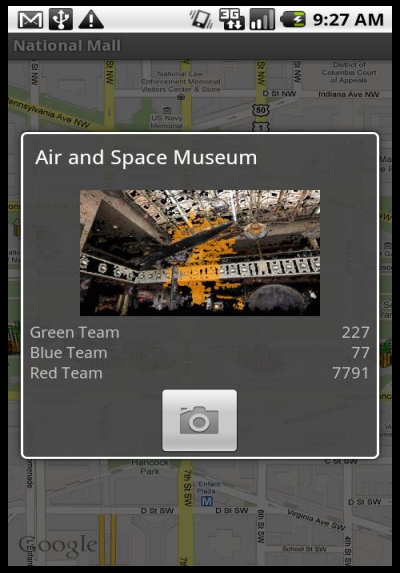
- reCAPTCHA is a free CAPTCHA service that helps to digitize books, newspapers and old time radio shows.
- reCAPTCHA does exactly that by channeling the effort spent solving CAPTCHAs online into "reading" books.

PhotoCity

Capture the world, one photo at a time

- PhotoCity is a **game** played **outdoors**, with **any camera**. By taking photos of buildings around your **city** or **school campus**, users can *earn points*, *capture flags*, and virtually *own their favorite buildings*, all while contributing to a **large-scale 3D reconstruction**!



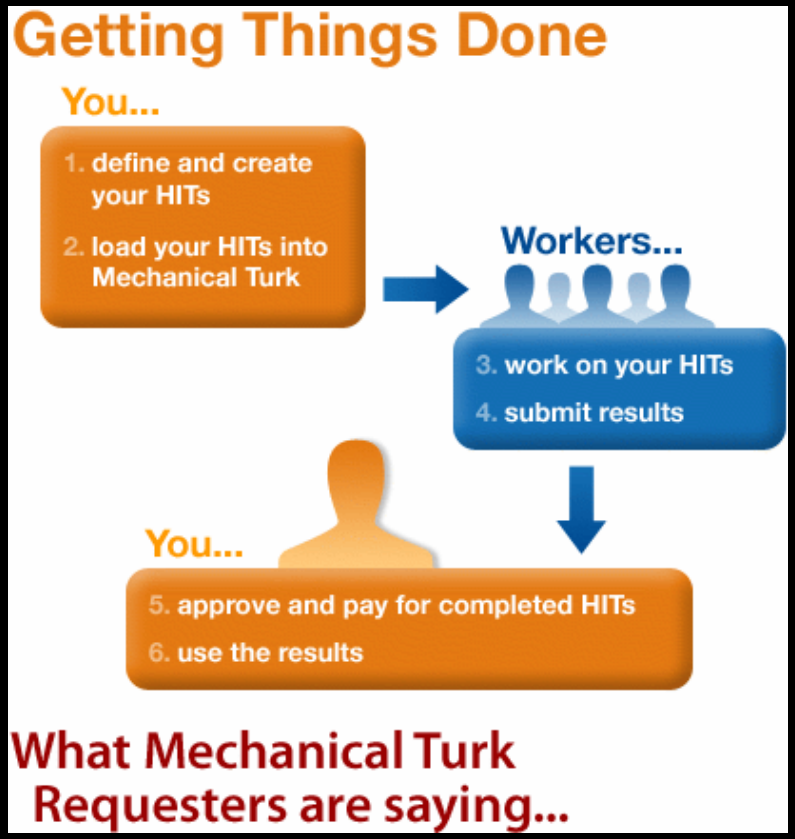


How Does Human Computation Work?

- Incentive mechanisms
  - Fun
  - Access to some services
  - Money
- Validity Guarantee
  - Cross-validation/redundancy

Amazon Mechanical Turk

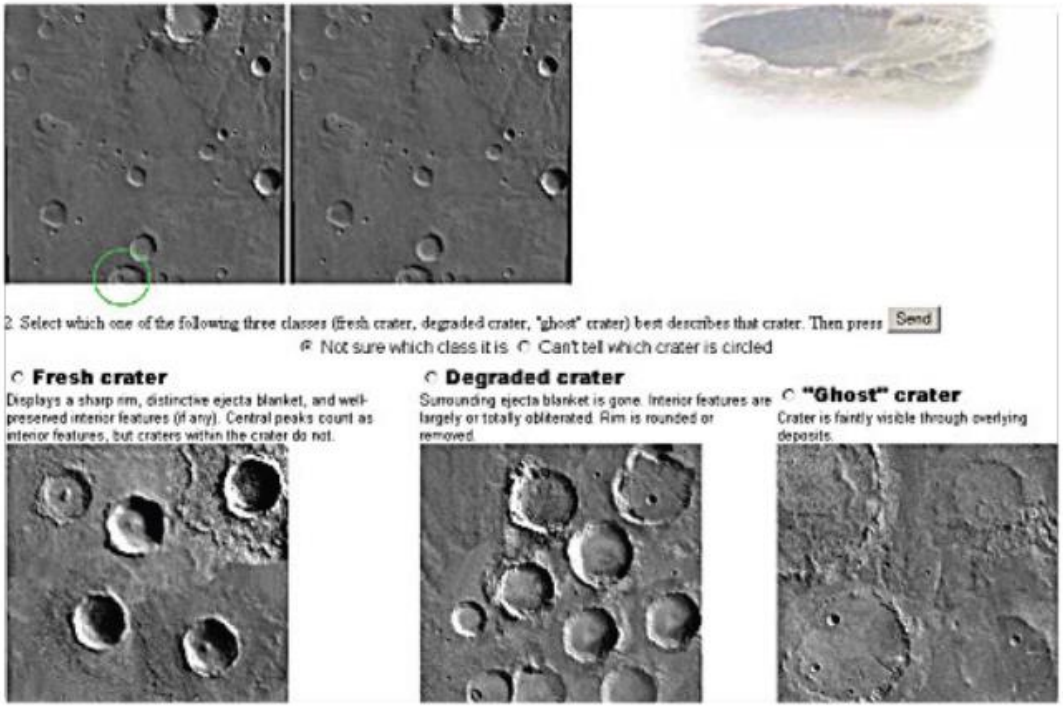
- Human Intelligence Task (HIT)
  - Tasks hard for computers
- Developer
  - Prepay the money
  - Publish HITs
  - Get results
- Worker
  - Complete the HITs
  - Get paid



Artificial Intelligence

- Obvious applications of MTurk
  - User survey
  - Image tagging
  - Data collection
  - User studies
- And not so obvious application of Mturk
  - Soylent: A Word Processor with a Crowd Inside
  - VizWiz: Accessibility Assistant to Visual Impired Users

NASA Clickworkers

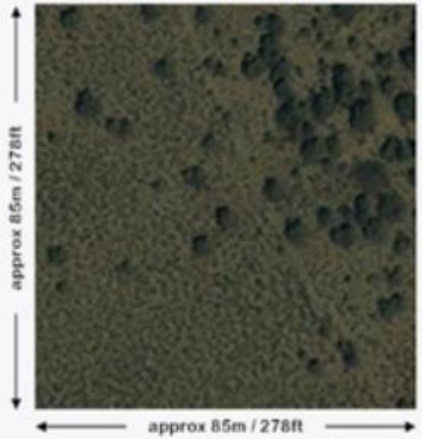


Search for Steve Fosset

Steve Fossett Missing: Help find him by searching satellite imagery

New examples and instructions! If this is your first time working on this task, please carefully review the instructions further down.

Review This Image



Example

(c) This imagery is copyright GeoEye Example of an airplane and an airplane crash showing the size of object being searched for.

Need More Detail?

To view in Google Earth, load the KML file below then cut and paste:

38.290787,-118.732681

in the "Fly To" box found at the top left corner of the application.

For a similar viewing experience in Google Earth to the above image, navigate to an altitude of roughly 1,500 feet.

IMPORTANT: Please ensure that you've loaded the following KML file below in Google Earth before navigating to the co-ordinates. Otherwise, you risk looking at old and irrelevant images.

KML file for Google Earth Searching:
http://s3.amazonaws.com/Fossett-GE4/GeoEye_4/index.kml

Craft Brewery Start-up Needs Your Help!!

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Held by Fiddleheadbrewing in Logo Design. Tweet Contest | Share on Facebook | ! | Report Contest

OPEN
contest accepting entries, 6 days, 7 hours remaining (more details)

healthy	guaranteed	entries	prize
		46	$500

read the brief | submit a design

Entries most recent first

Time Submitted | Show Only...


#46 By bojanaplas

#45 By ina

#44 By heavyfolde

#43 By heavyfolde

#42 By moNte_LT

#41 By Janka

#40 By Janka


#39 By Most Want

#38 By Florin Desi

#37 By blackwhite

#36 By Hasinakely

#35 By Sadanand

#34 By Sadanand

#33 By Sadanand

#32 By zuliant Ngo

#31 By zuliant Ngo


#30 By zuliant Ngo

#29 By Montney

#28 By papileo

#27 By daniel spav

#26 By tepibarat

#25 By ChrissieCh

#24 By ChrissieCh

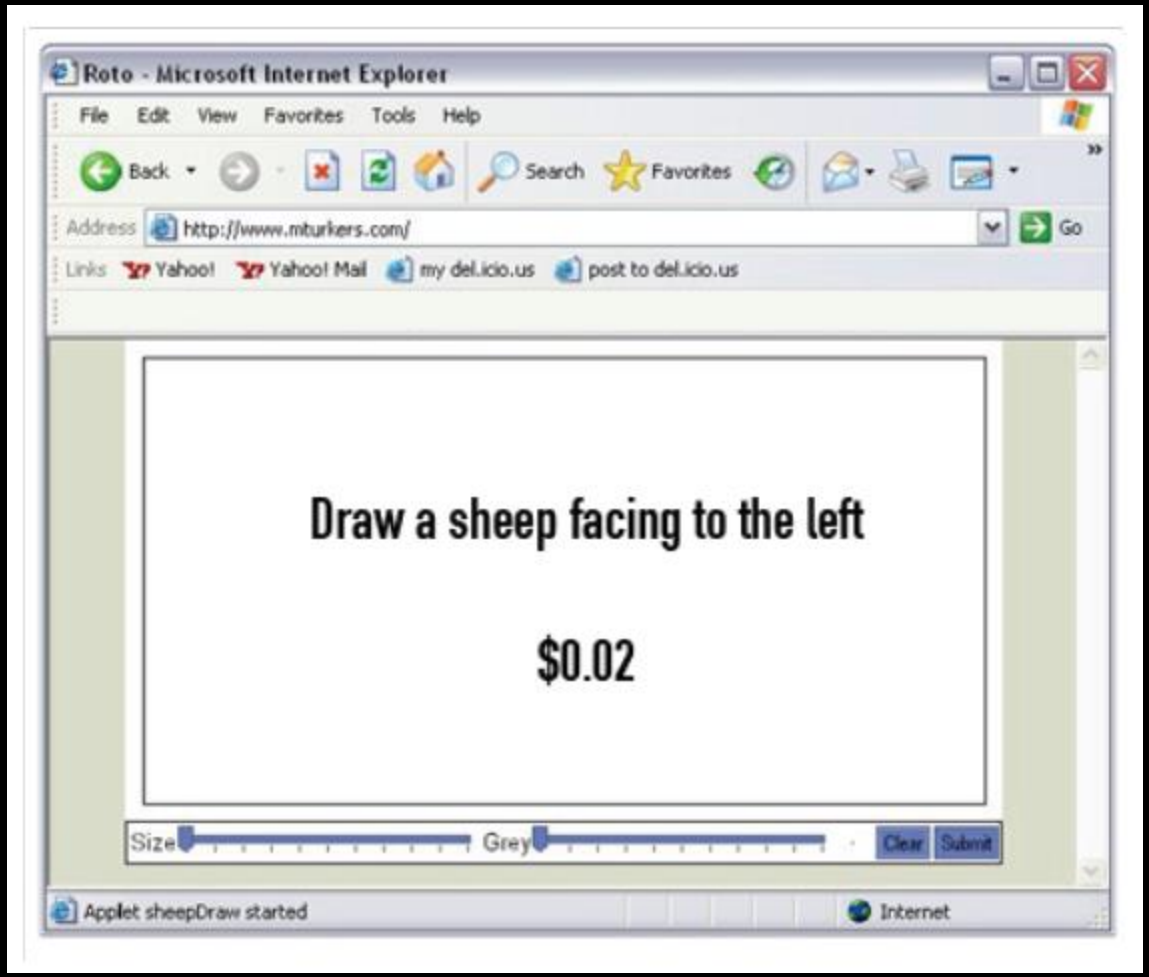
#23 By Devs_mum

#20 By Devs_mum

#19 By Pac3

#18 By Sadanand

#17 By Sadanand


Roto - Microsoft Internet Explorer
File Edit View Favorites Tools Help
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Draw a sheep facing to the left
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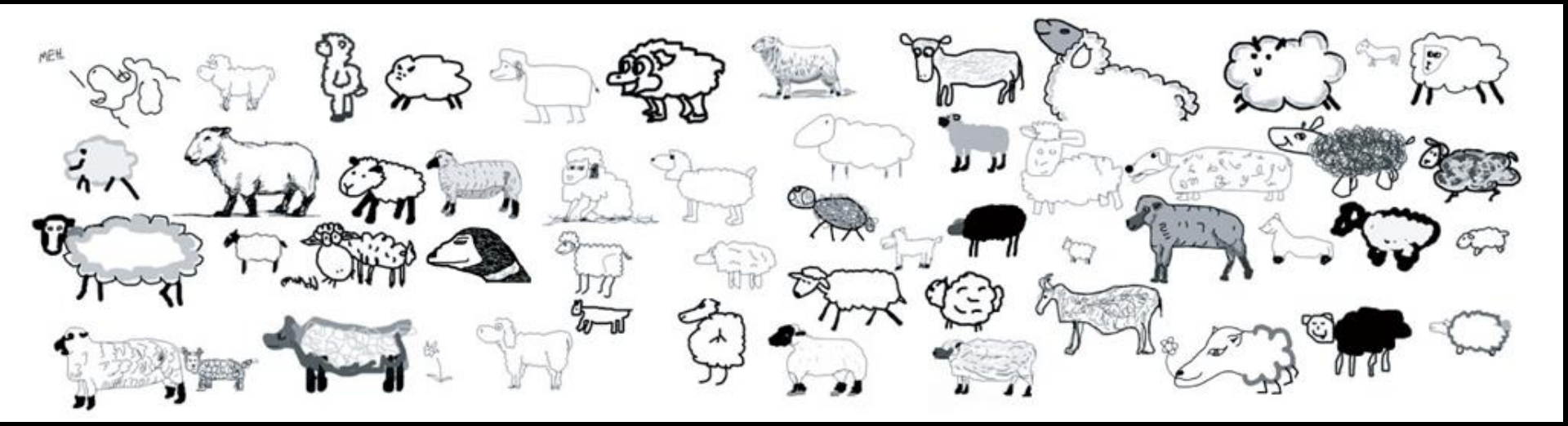
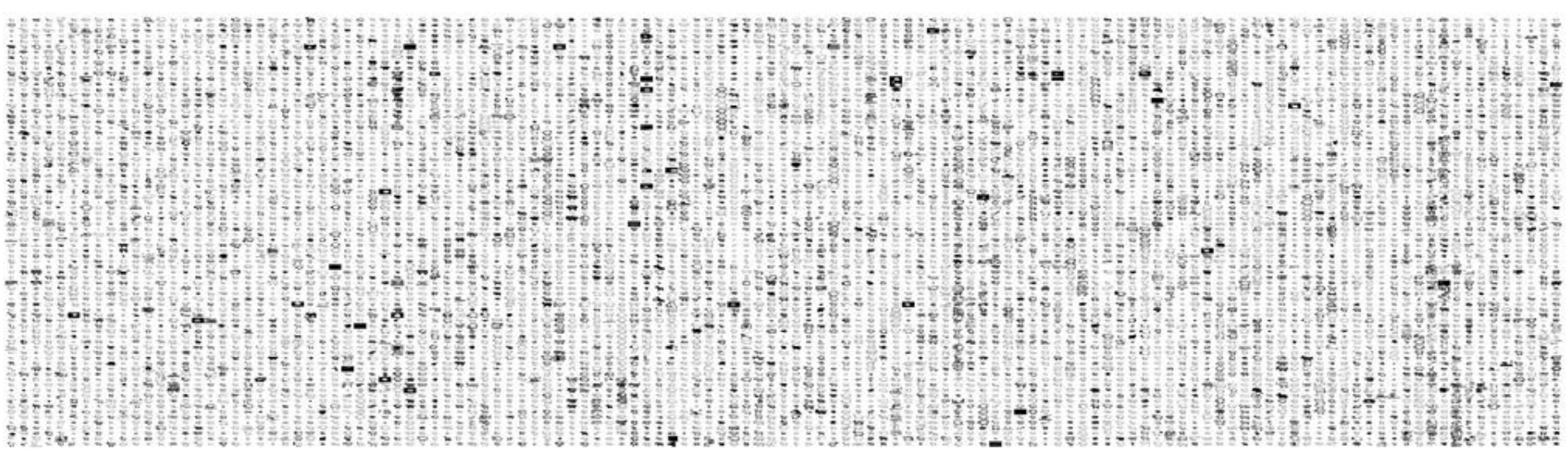


Aaron Koblin, The Sheep Market

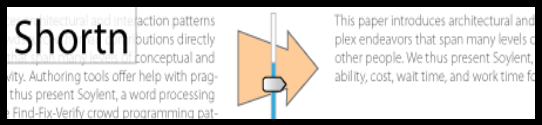


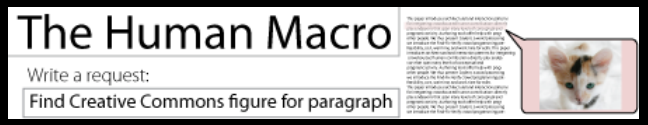
Aaron Koblin, The Sheep Market

http://www.thesheepmarket.com/

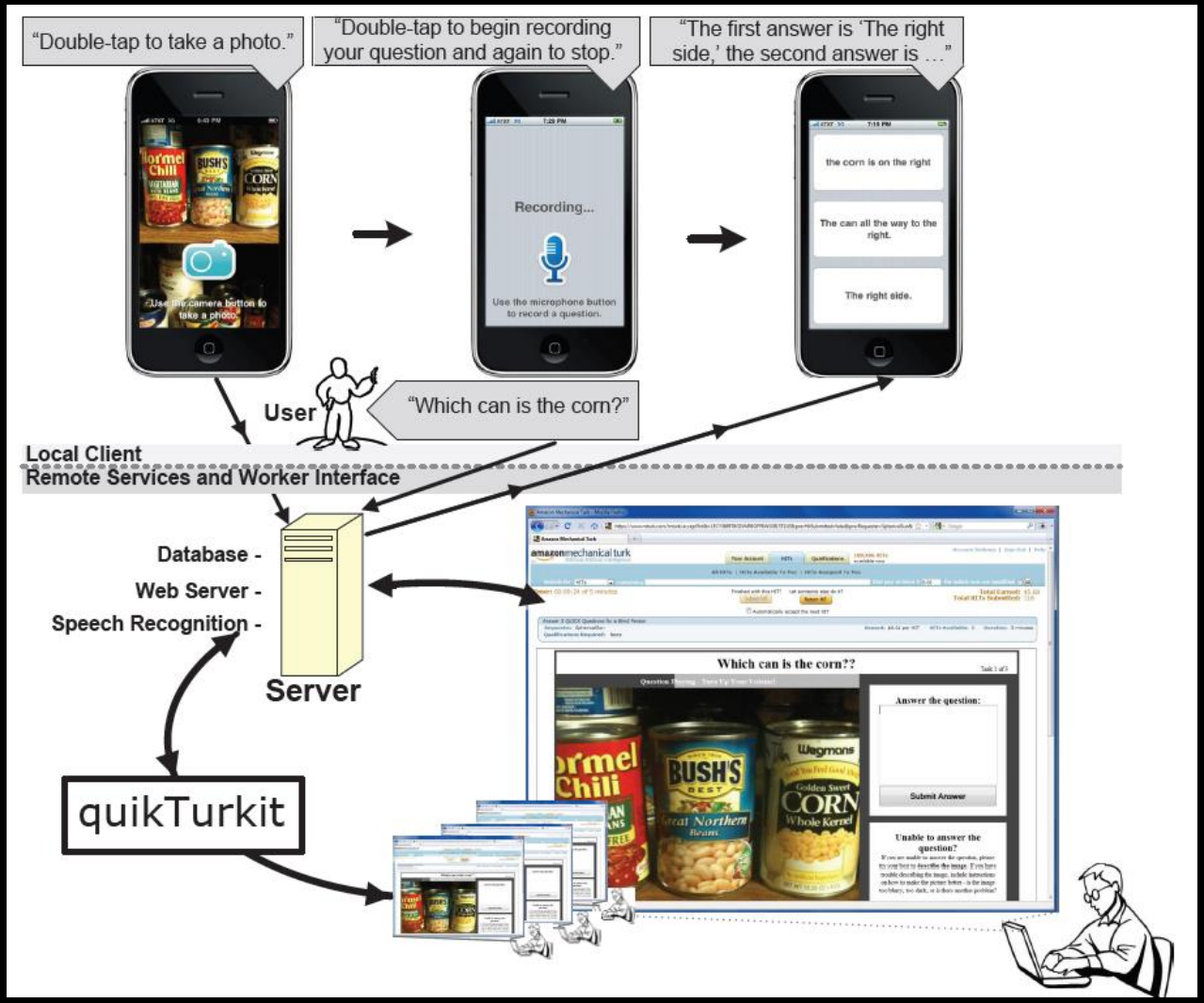
Soylent: A Word Processor with a Crowd Inside

Input	Original Length	Final Length	Turk Statistics	Time per Paragraph	Example Output
Blog	3 paragraphs 12 sentences 272 words	83% character length	$4.57 158 workers	46 – 57 min	Print publishers are in a tizzy over Apple's new iPad because they hope to ~~finally~~ be able to charge for their digital editions. But in order to get people to pay for their magazine and newspaper apps, they ~~are going to~~ have to offer something different that readers cannot get at the newsstand or on the open Web.
Classic UIST [28]	7 paragraphs 22 sentences 478 words	87%	$7.45 264 workers	49 – 84 min	The metaDESK effort is part of the larger Tangible Bits project~~. The Tangible Bits vision paper~~, which introduced the metaDESK ~~along with~~and two companion platforms, the transBOARD and ambientROOM.
Draft UIST [29]	5 paragraphs 23 sentences 652 words	90%	$7.47 284 workers	52 – 72 min	~~In this paper we argue that~~ it is possible and desirable to combine the easy input affordances of text with the powerful retrieval and visualization capabilities of graphical applications. We present WenSo, ~~a tool that~~which uses lightweight text input to capture richly structured information for later retrieval and navigation in a graphical environment.
Rambling E-mail	6 paragraphs 24 sentences 406 words	78%	$9.72 362 workers	44 – 52 min	~~A previous board member,~~ Steve Burleigh~~,~~ created our web site last year and gave me alot of ideas. ~~For this year,~~ I found a web site called eTeamZ that hosts web sites for sports groups. Check out our new page: […]
Technical Comp. Sci. [3]	3 paragraphs 13 sentences 291 words	82%	$4.84 188 workers	132 – 489 min	Figure 3 shows the pseudocode that implements this design for Lookup. FAWN-DS extracts two fields from the 160-bit key: ~~the i low order bits of the key~~ (the index bits) and the next 15 low order bits ~~(the key fragment)~~.





VizWiz: Nearly Realtime Answers to Visual Questions



The Demographics of MTurk

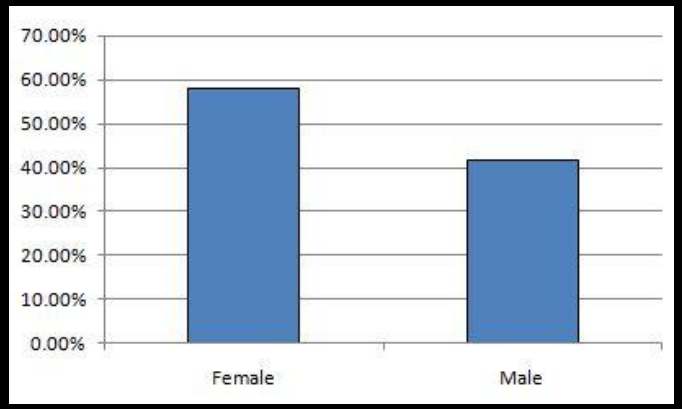
- Survey on 1000 Turkers
  - Conduct the survey twice (Dec. 2008 and Oct. 2008)
  - Consistent statistics
  - Blog Post:
    - http://behind-the-enemy-lines.blogspot.com/2007/08/experiences-using-amazon-mechanical.html
- Where are Turkers from?
  - United States 76.25%
  - India 8.03%
  - United Kingdom 3.34%
  - Canada 2.34%

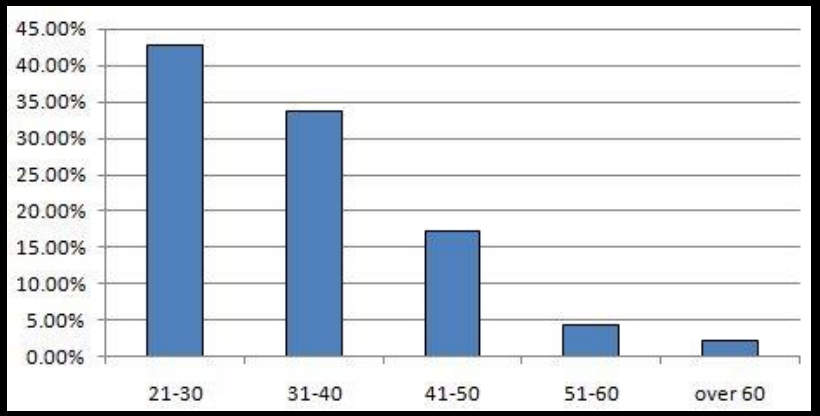
How Much Should I Pay?

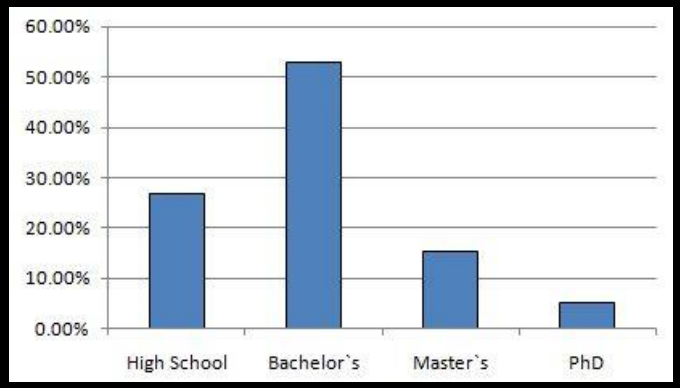
- It depends on the task.

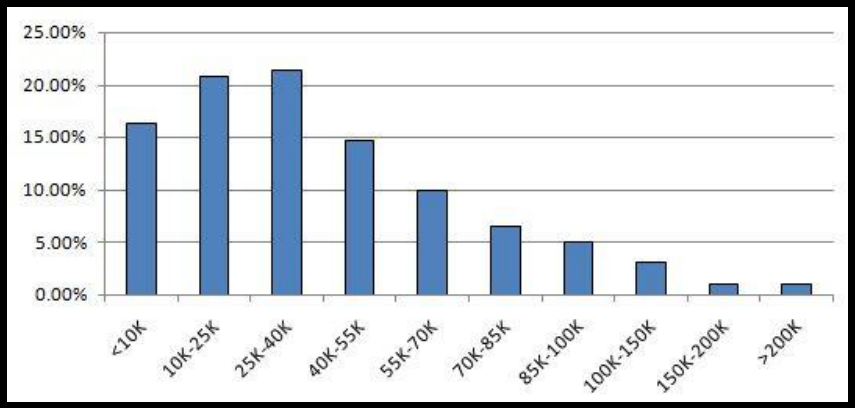
- Some information:
  - Payment >= 0.01: 586
  - Payment >= 0.05: 357
  - Payment >= 0.10: 264
  - Payment >= 0.50: 74
  - Payment >= 1.00: 48
  - Payment >= 5.00: 5

Other Statistics







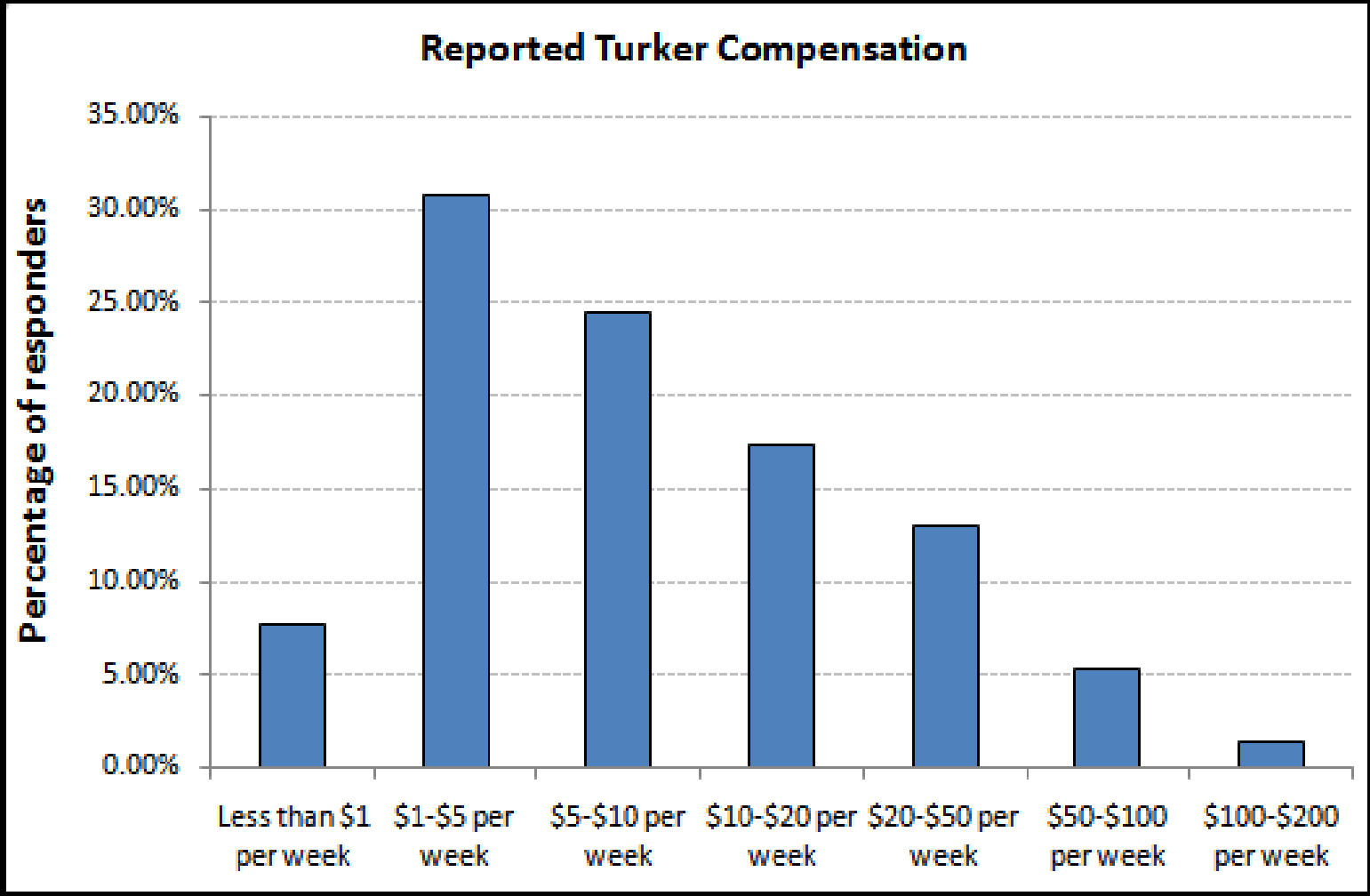


Comparing with Internet Demographics

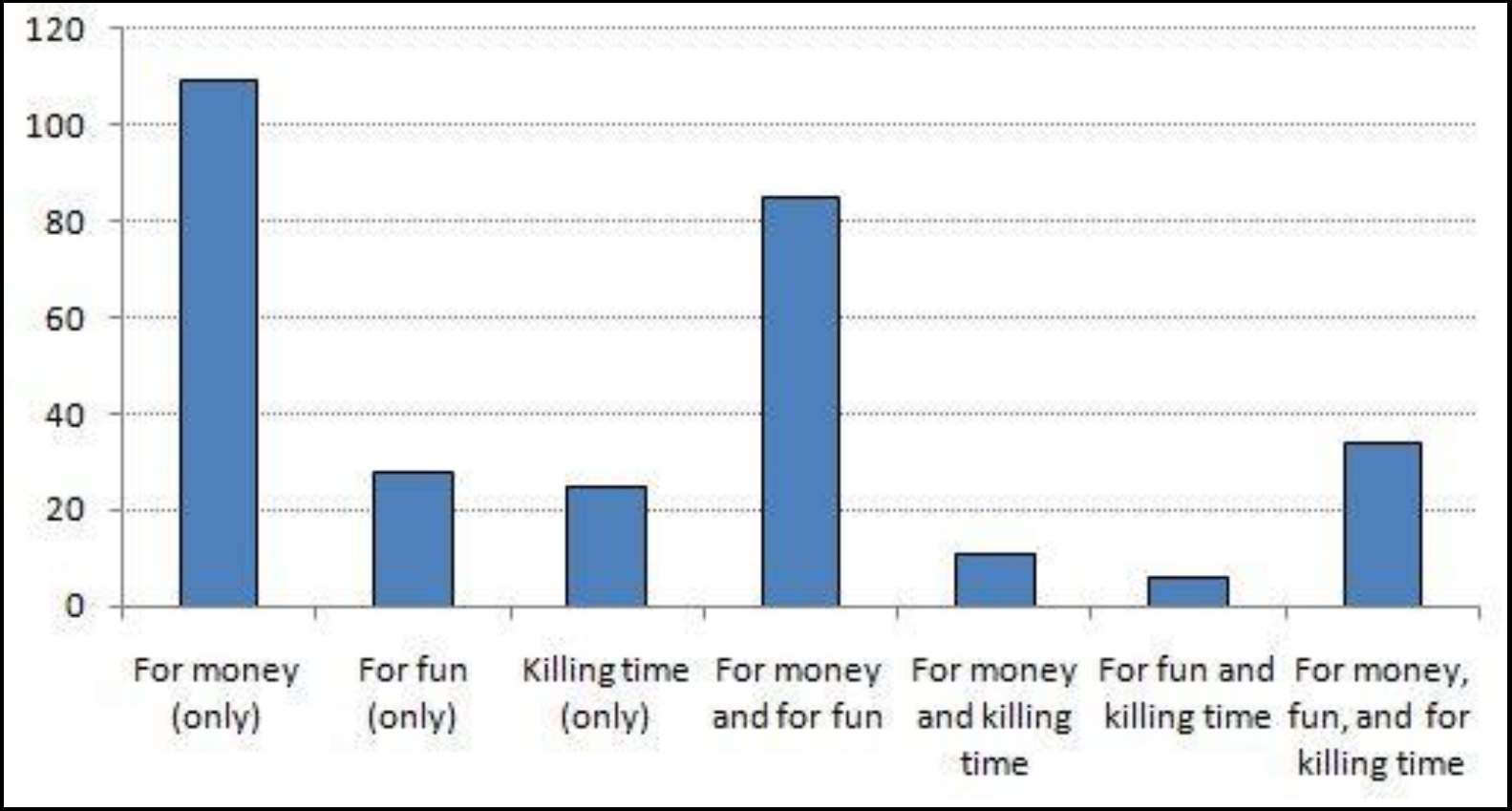
- Use the data from ComScore

- In summary, Tukers are
  - younger
    - Portion of 21-35 years old: 51% vs. 22% in internet
  - mainly female
    - 70% female vs. 50 % female
  - having lower income
    - 65% turkers with income < 60k/year vs. 45% in internet
  - having smaller family
    - 55% turkers have no children vs. 40% in internet

How Much Turkers Earn?



Why Turkers Turk?



Discussions

- Are they fads or trends?
- What are the prospective limitations? Are the limitations fixable?
- Can we discover solutions to some of more challenging tasks (more sequential / interconnected components in the task) under such framework?