

Crowdsourcing



THE SCALE AND INDEPENDENCE OF CROWDS

successfully assessed the weight of an ox [Galton 1907]



787 Farmers

None guessed correctly

Mean of guesses: 1,197 lb

Exact weight: 1,198 lb



Assumes errors are evenly distributed

Crowdsourcing: Origins & Models

Jeff Howe, *The Rise of Crowdsourcing*, Wired 2006

Pay anonymous workers for micro-tasks

amazon mechanical turk
Artificial Artificial Intelligence

Your Account HITs Qualifications

Already have an account?
Sign in as a [Worker](#) | [Requester](#)

Introduction | Dashboard | Status | Account Settings

Mechanical Turk is a marketplace for work.
We give businesses and developers access to an on-demand, scalable workforce.
Workers select from thousands of tasks and work whenever it's convenient.

309,931 HITs available. [View them now.](#)

Make Money
by working on HITs

HITs - *Human Intelligence Tasks* - are individual tasks that you work on. [Find HITs now.](#)

As a Mechanical Turk Worker you:

- Can work from home
- Choose your own work hours
- Get paid for doing good work

Find an interesting task **Work** **Earn money**

Find HITs Now

or [learn more about being a Worker](#)

Get Results
from Mechanical Turk Workers

Ask workers to complete HITs - *Human Intelligence Tasks* - and get results using Mechanical Turk. [Get Started.](#)

As a Mechanical Turk Requester you:

- Have access to a global, on-demand, 24 x 7 workforce
- Get thousands of HITs completed in minutes
- Pay only when you're satisfied with the results

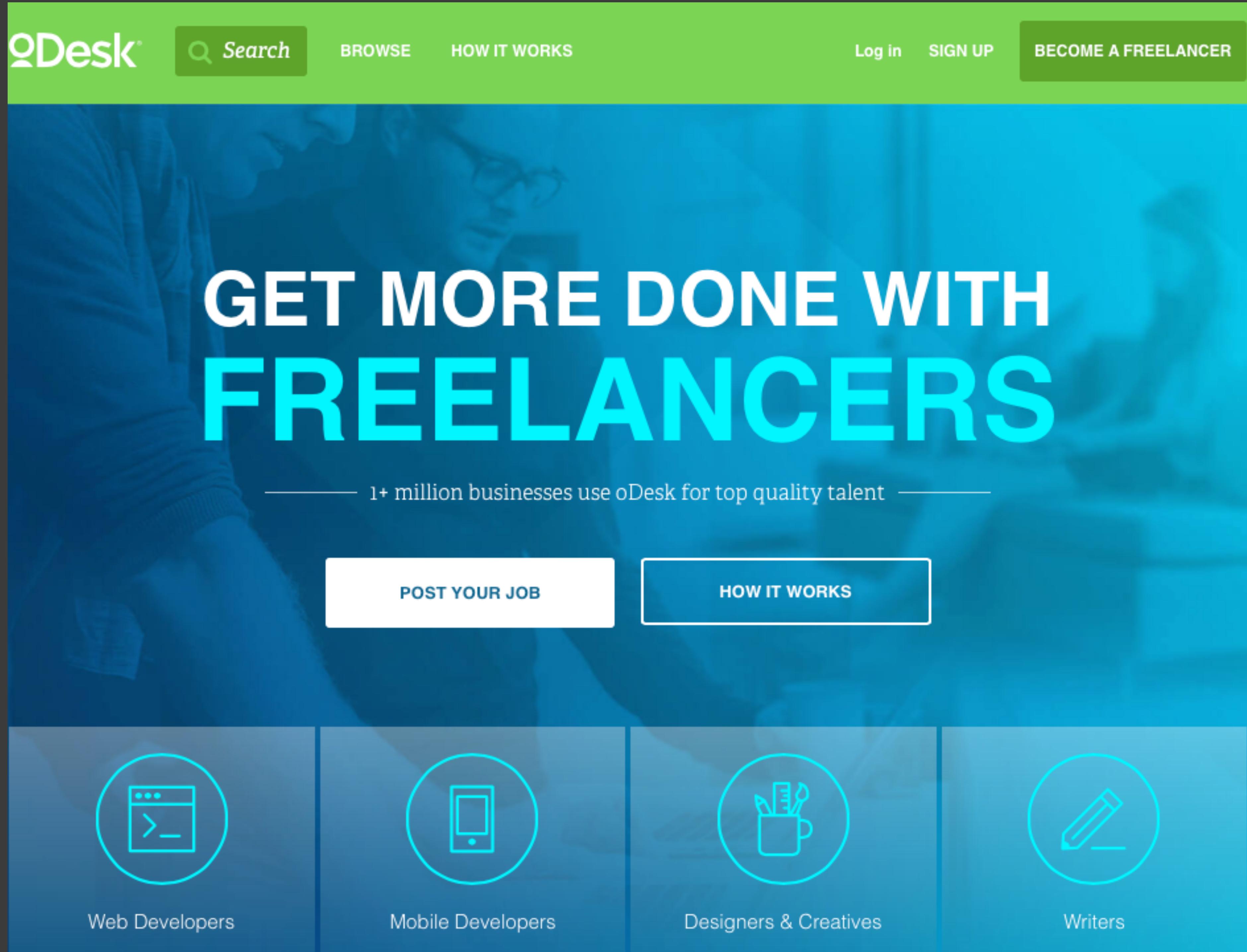
Fund your account **Load your tasks** **Get results**

Get Started

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Hire skilled workers for mini-tasks



The image shows the homepage of oDesk. At the top, there's a green navigation bar with the oDesk logo, a search bar, and links for 'BROWSE', 'HOW IT WORKS', 'Log in', 'SIGN UP', and 'BECOME A FREELANCER'. Below the bar, a large blue-tinted background image of a person working on a laptop is visible. Overlaid on this image is the main headline: 'GET MORE DONE WITH FREEELANCERS' in large, bold, white and cyan text. Below the headline is a subtitle: '1+ million businesses use oDesk for top quality talent'. At the bottom of the page, there are four circular icons representing different skill categories: 'Web Developers' (code editor icon), 'Mobile Developers' (smartphone icon), 'Designers & Creatives' (coffee cup with pens icon), and 'Writers' (pencil icon).

oDesk Search

BROWSE HOW IT WORKS

Log in SIGN UP BECOME A FREELANCER

GET MORE DONE WITH FREEELANCERS

1+ million businesses use oDesk for top quality talent

POST YOUR JOB HOW IT WORKS

Web Developers Mobile Developers Designers & Creatives Writers

Complete tasks with incidental work



stop spam.
read books.

work complexity

creative,
multi-faceted

simple,
transactional



amazon mechanical turk
Artificial Artificial Intelligence

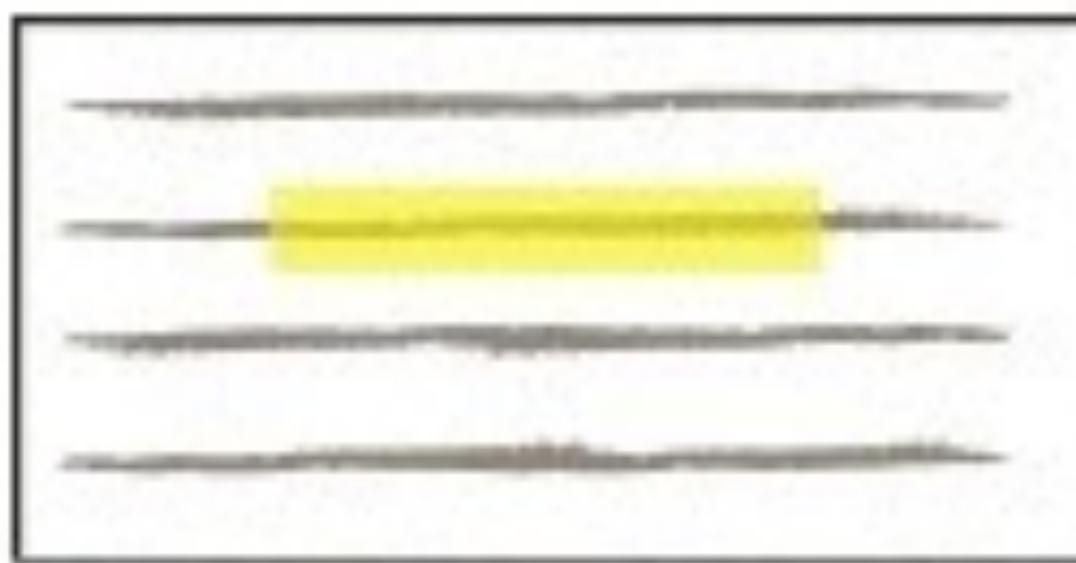
novice

skill level
expert

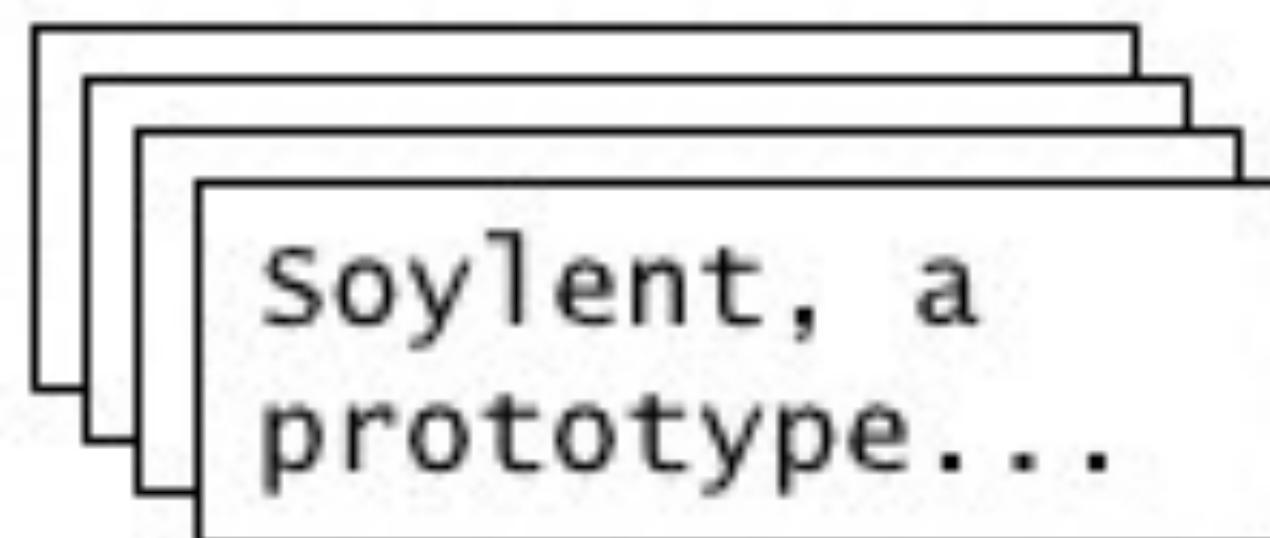
A little structure can dramatically improve outcomes

- Eager Beavers vs. Lazy Turkers
- Find-Fix-Verify

Find a problem



Fix each problem



Verify quality of each fix

- Soylent-is, a prototype...
- Soylent is-a prototypes...
- Soylent is a prototypetest...

Motivation

Submit this task and do another task for more pay

Left click to make a point, right click to delete a point
If you do not see the image below, reduce the magnification, or restart your browser.

Total earnings: \$0.00 Time left: 14:50

Magnification: (0.8x) DO NOT RELOAD THE PAGE - YOU WILL LOSE YOUR POINTS

(Mouse over to see image)

Find all **cancerous tumor cells** in the image below:

Click here if you do not see an image below

Top Reasons HITs are Rejected

1. Tumors were not clicked on at all.
2. Tumors were marked multiple times. There should only be one unique click per tumor.
3. Tumors were not marked in their centers. They should be marked in the centers.
4. Too many tumors were missed (in the case of the goal being all tumors).

(a) Meaningful treatment

Submit this task and do another task for more pay

Left click to make a point, right click to delete a point
If you do not see the image below, reduce the magnification, or restart your browser.

Total earnings: \$0.00 Time left: 14:50

Magnification: (0.8x) DO NOT RELOAD THE PAGE - YOU WILL LOSE YOUR POINTS

(Mouse over to see image)

Find all **objects of interest** in the image below:

Click here if you do not see an image below

Top Reasons HITs are Rejected

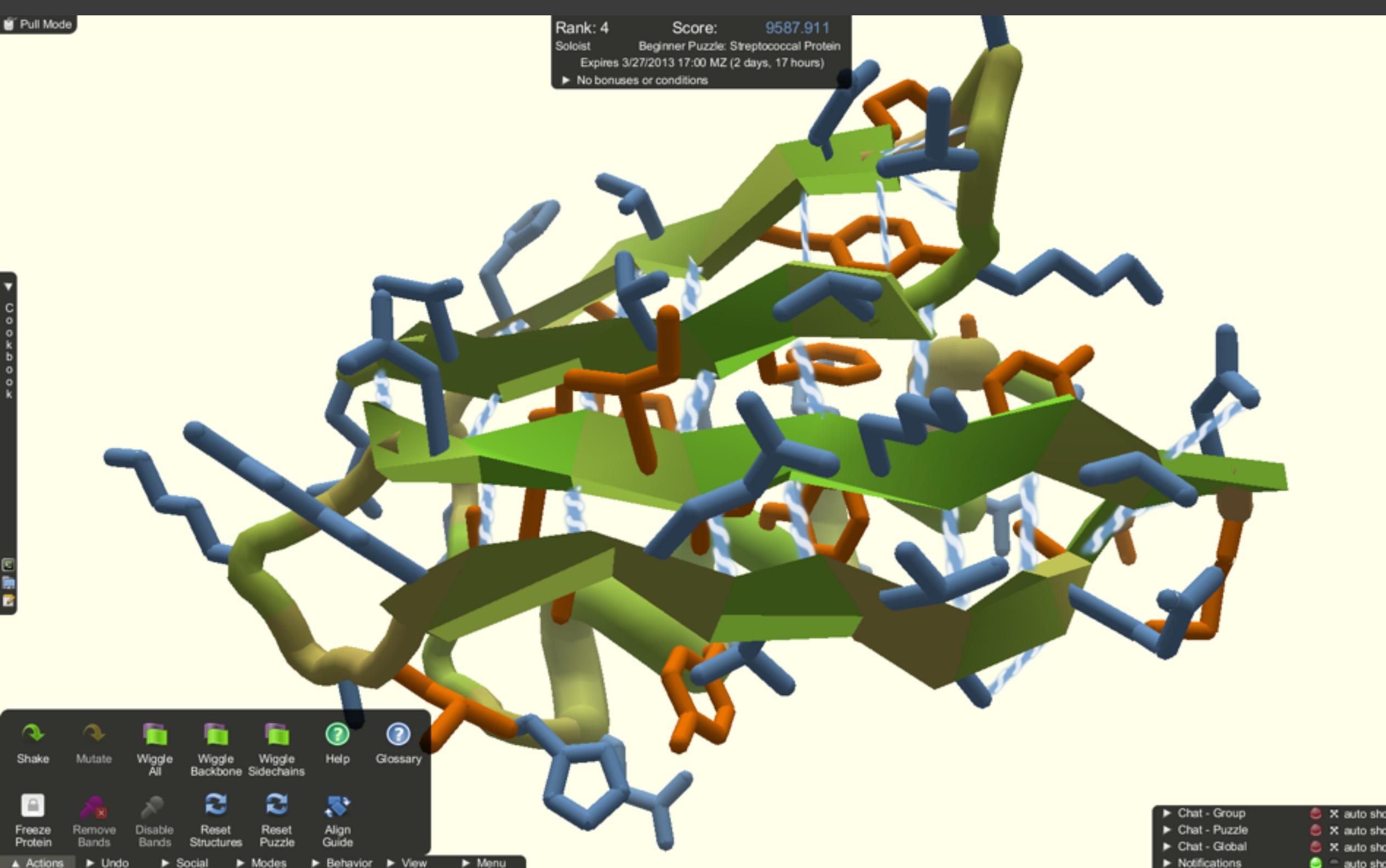
1. Objects were not clicked on at all.
2. Objects were marked multiple times. There should only be one unique click per object.
3. Objects were not marked in their centers. They should be marked in the centers.
4. Too many objects were missed (in the case of the goal being all objects).

(b) Zero-context / Shredded treatments



Unpaid Crowdsourcing

The crowd can demonstrate surprising expertise



Institution: UNIV OF CALIF SAN DIEGO
Proceedings of the National Academy of Sciences of the United States of America

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Home > Current Issue > vol. 108 no. 47 > Firas Khatib, 18949–18953, doi: 10.1073/pnas.1115898108

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Algorithm discovery by protein folding game players

Firas Khatib^a, Seth Cooper^b, Michael D. Tyka^a, Kefan Xu^b, Ilya Makedon^b, Zoran Popović^b, David Baker^{a,c,1}, and Foldit Players

Author Affiliations

Contributed by David Baker, October 5, 2011 (sent for review June 29, 2011)

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Abstract

Foldit is a multiplayer online game in which players collaborate and compete to create accurate protein structure models. For specific hard problems, Foldit player solutions can in some cases outperform state-of-the-art computational methods. However, very little is known about how collaborative gameplay produces these results and whether Foldit player strategies can be formalized and structured so that they can be used by computers. To determine whether high performing player strategies could be collectively codified, we augmented the Foldit gameplay mechanics with tools for players to encode their folding strategies as “recipes” and to share their recipes with other players, who are able to further modify and redistribute them. Here we describe the rapid social evolution of player-developed folding algorithms that took place in the year following the introduction of these tools. Players developed over 5,400 different recipes, both by creating new algorithms and by modifying and recombining successful recipes developed by other players. The most successful recipes rapidly spread through the Foldit player population, and two of the recipes became particularly dominant. Examination of the algorithms encoded in these two recipes revealed a striking similarity to an unpublished algorithm developed by scientists over the same period. Benchmark calculations show that the new algorithm independently discovered by scientists and by Foldit players outperforms previously published methods. Thus, online scientific game frameworks have the potential not only to solve hard scientific problems, but also to discover and formalize effective new strategies and algorithms.

citizen science | crowd-sourcing | optimization | structure prediction | strategy

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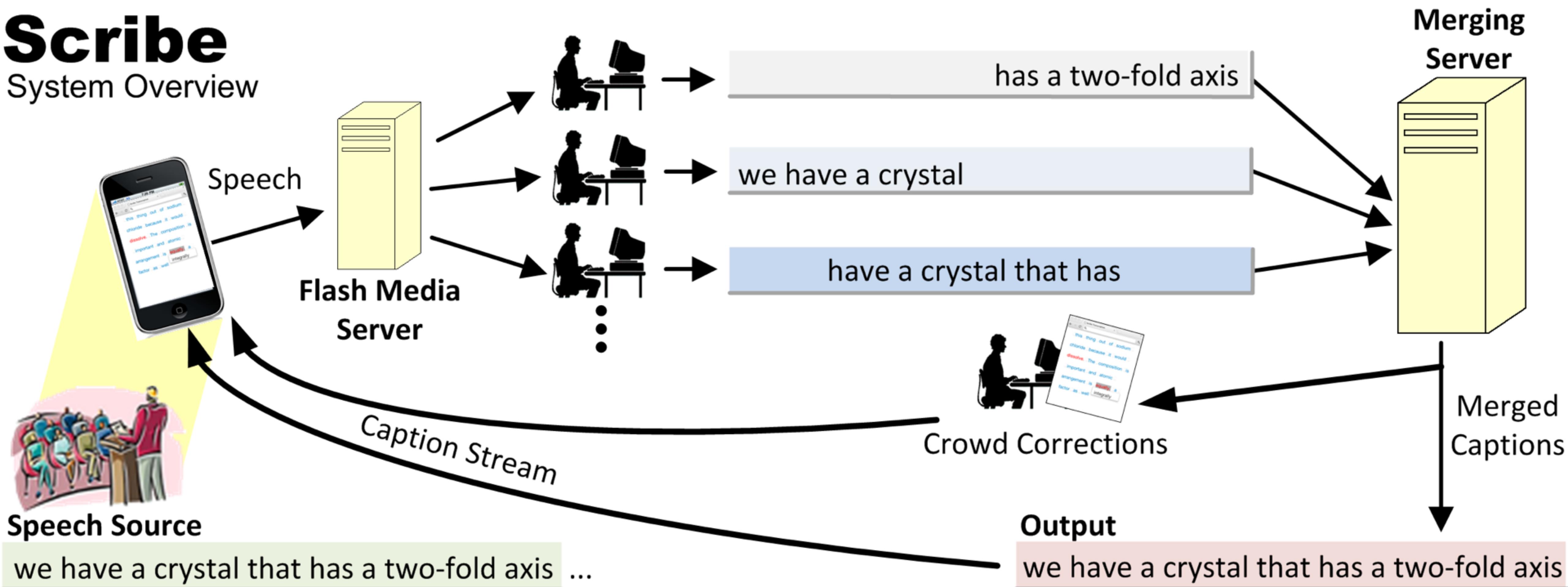
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Scribe System Overview



The Crowd Within

Design melds physical, digital, and social worlds

