

HOW TO USE CROWDSOURCING IN HCI RESEARCH

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Assistant Professor
Carnegie Mellon
(Stanford postdoc)

Carnegie Mellon
Human-Computer Interaction Institute



STANFORD HCI GROUP

What is crowdsourcing?



WIKIPEDIA
The Free Encyclopedia

- [Main page](#)
- [Contents](#)
- [Featured content](#)
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Crowdsourcing

From Wikipedia, the free encyclopedia

Crowdsourcing is the act of [outsourcing](#) tasks, traditionally performed by an employee or [contractor](#), to an undefined, large group of people or community (a "crowd"), through an open call.

Jeff Howe, one of the first authors to employ the term, established that the concept of crowdsourcing depends essentially on the fact that because it is an open call to an undefined group of people, it gathers those who are most fit to perform tasks, solve complex problems and contribute with the most relevant and fresh ideas.

For example, the public may be invited to develop a new technology, carry out a design task (also known as **community-based design**^[1] and [distributed participatory design](#)), refine or carry out the steps of an algorithm (see [human-based computation](#)), or help capture, systematize or analyze large amounts of data (see also [citizen science](#)).

The term has become popular with businesses, authors, and journalists as shorthand for the trend of leveraging the mass collaboration enabled by [Web 2.0](#) technologies to achieve business goals. However, both the term and its underlying business models have attracted controversy and criticisms.

Contents [\[hide\]](#)

2:05
Time Left

The ESP Game

0090
score



Taboo Words

USO

BANNER

PEOPLE

Your Guesses

CROWD

STAR

STARS

BLUE

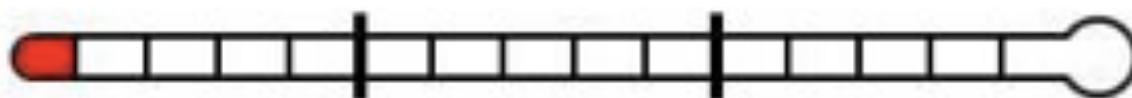
WHITE

BLACK

Type your next guess:

Pass

Your partner has
entered a guess



Flag

JOHNNY CASH PROJECT

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Explore ▾

Contribute

About

Cred



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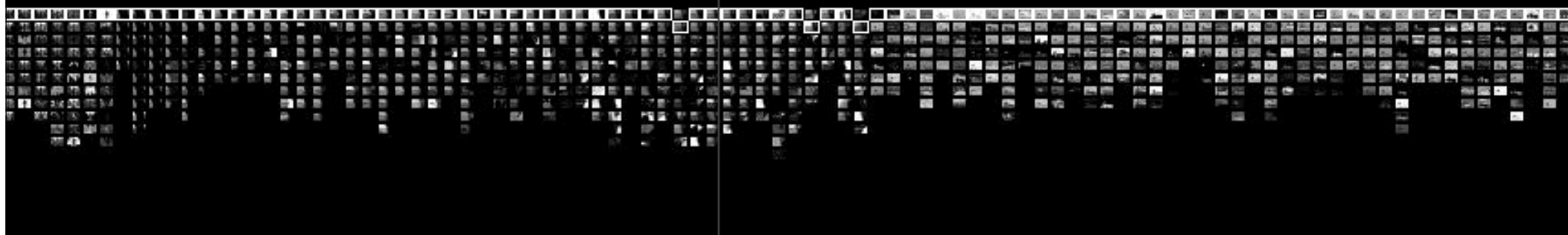
Explore ▾ | Contribute | About | Cred



B



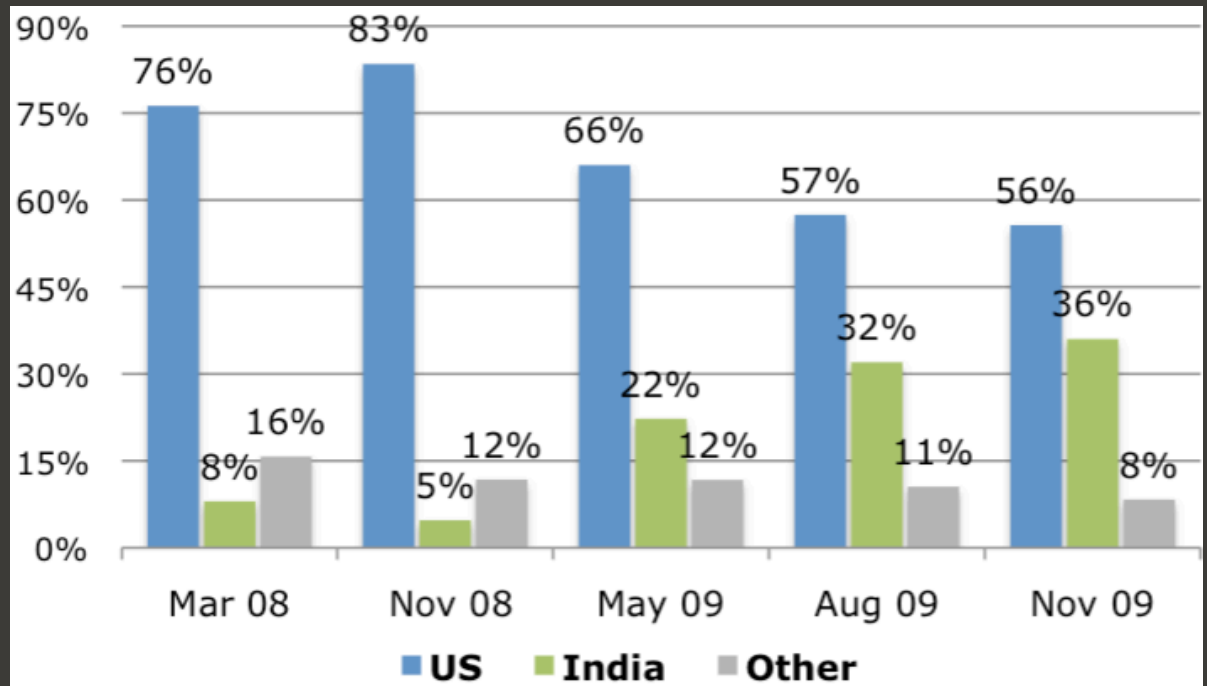
FRAME: 149



How are HCI researchers
using crowdsourcing?

Conducting surveys

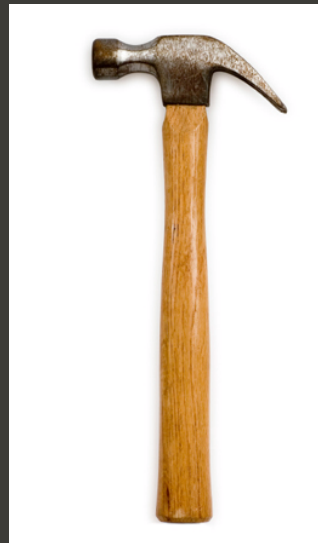
| Survey Date | Sample Size |
|----------------|-------------|
| Mar. 2008 [10] | $n = 300$ |
| Nov. 2008 [11] | $n = 1010$ |
| Feb. 2009 | $n = 878$ |
| May 2009 | $n = 512$ |
| Aug. 2009 | $n = 578$ |
| Nov. 2009 | $n = 733$ |



Ross, J., et al., at CHI 2010

Ipeirotis, P. <http://behind-the-enemy-lines.blogspot.com>

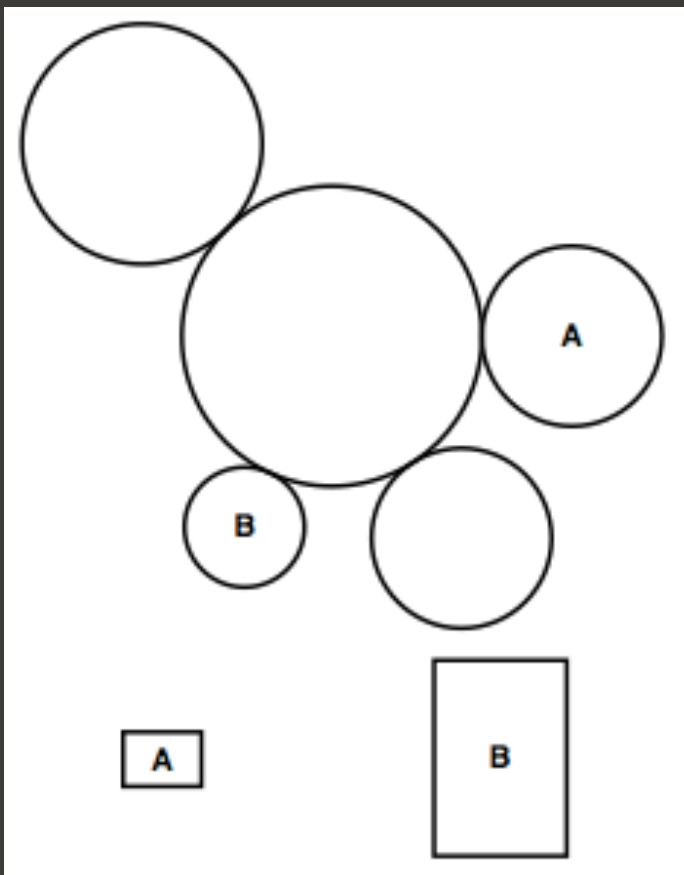
Analyzing images and text



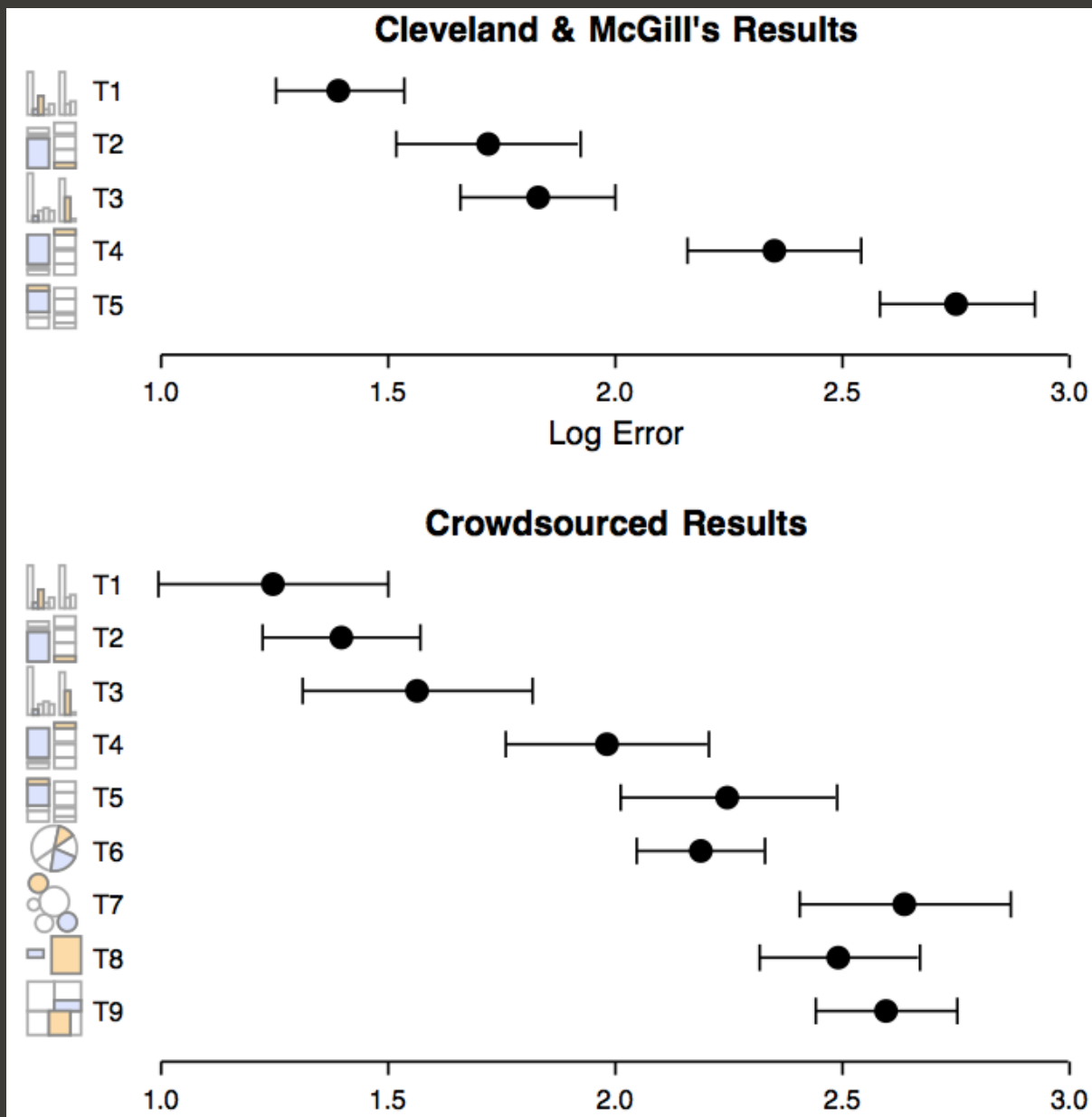
Lewis, S., Dontcheva, M., and Gerber, E. CHI 2011

| Affect | Image Description | MTurk Rating |
|----------------|-------------------|------------------|
| | | Mean (Std. Dev.) |
| Positive | Laughing baby | 8.65 (0.67) |
| | Puppy | 8.25 (1.16) |
| | Dessert | 8.15 (1.31) |
| | Beach | 8.00 (1.62) |
| | Bunny | 7.90 (1.33) |
| | Bride | 7.85 (1.46) |
| | Couple | 7.70 (1.38) |
| | Mountain lake | 7.45 (1.50) |
| | Sunflower | 7.45 (1.23) |
| | Salsa | 7.20 (1.47) |
| | Mountain top | 6.90 (1.55) |
| | Athlete | 6.45 (1.57) |
| | Neutral | Cutlery |
| Shoes | | 6.80 (1.70) |
| Umbrella | | 6.65 (1.57) |
| Clothes rack | | 6.10 (1.52) |
| Stool | | 6.00 (1.38) |
| File cabinet | | 5.90 (1.97) |
| Hammer | | 5.70 (1.34) |
| Factory worker | | 5.55 (1.70) |
| Secretary | | 5.50 (1.43) |
| Trashcan | | 5.45 (1.73) |
| Negative | | Oil spill |
| | Natural disaster | 3.30 (2.15) |
| | Medical | 2.80 (1.79) |
| | Homeless | 2.58 (1.26) |
| | Dead body | 2.50 (1.79) |
| | Explosion | 2.45 (1.43) |
| | Stitches | 2.25 (1.48) |
| | Deformed | 2.15 (1.53) |

Running user studies

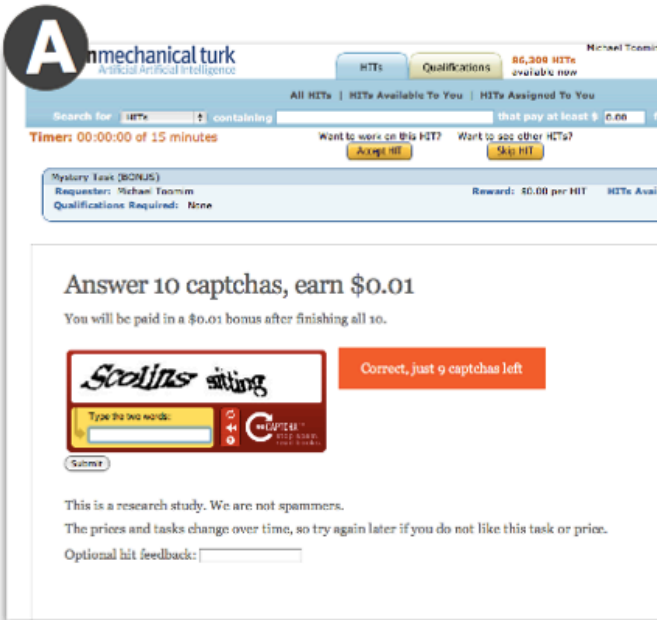


Heer, J. and Bostock, M.
CHI 2010

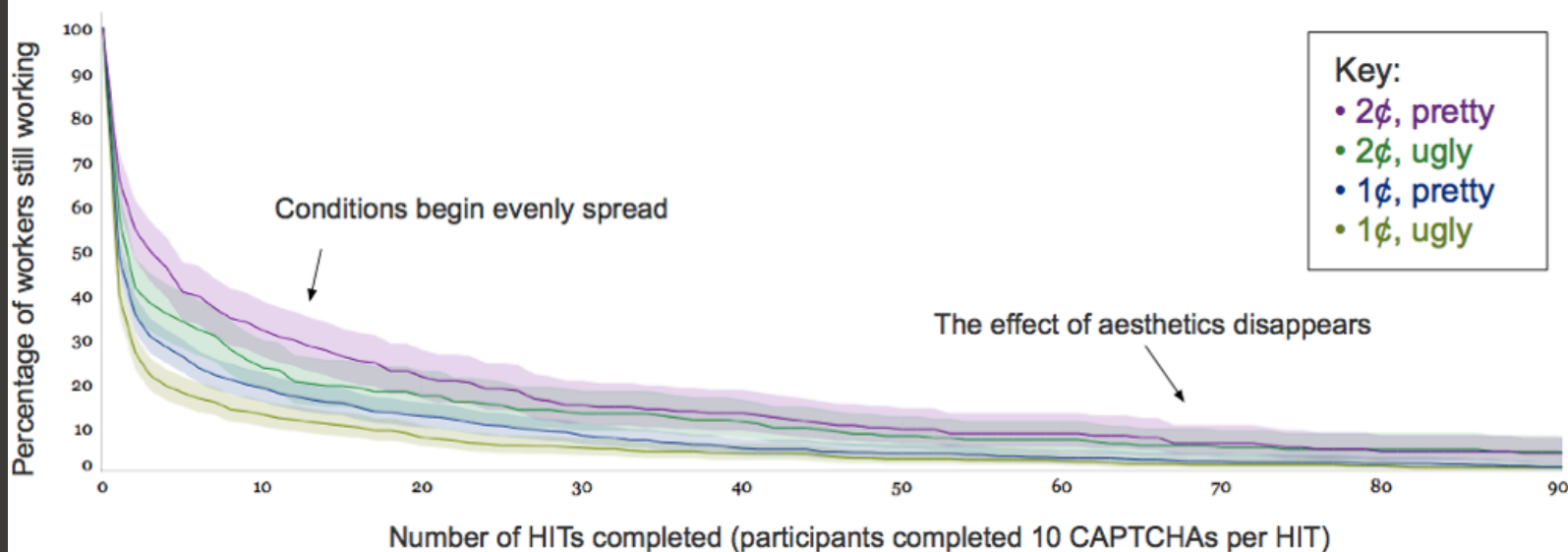


Running user studies

Toomim, M., et al.,
CHI 2011



Animated GIF shakes left and right. Very annoying.



Training machine algorithms

Create Mapping

http://bricolage.stanford.edu/app/?turkId=9999

Bing

Create Mapping

Map Webpages

For the highlighted segment on the left-hand page, find the best corresponding segment on the right-hand page (2 of 18)

Zoom In Zoom Out Match No Match Restart Select Enclosing Zoom In Zoom Out

National College of Art & Design
Postgraduate Study

Postgraduate Study
Learn about NCAD's long history and the opportunities for Postgraduate Students here. Practical information regarding college life, partnerships and the NCAD Library are also listed here.

Prospectus
Read the full Postgraduate prospectus for 2009/2010 online, including details regarding Application deadlines and procedures. The Prospectus is also available as a PDF download.

Yearbook 2008
View the Postgraduate Yearbook of the postgraduate research community of NCAD at work though the academic year 2007 – 08. The image above is a detail of work by Frank Long.

Contact information | NCAD Website | Terms | Site by Conor & David

31THREE The portfolio of Jesse Bennett-Chamberlain

HOME PORTFOLIO NOTEBOOK CONTACT

CREATIVE SERVICES

FOR THE DESIGN-CHALLENGED DEVELOPER

As a developer, you're an extremely creative individual. Getting your websites to behave in Internet Explorer is proof enough... you are creative. Even so, you may not have the time or know-how needed to get the design of your site looking as clean as your code. That's OK. I take design as seriously as you take your markup. Have a look around, and get in touch if you think we'd work well together.

| | | |
|--|--|---|
| CAMPAIGN MONITOR December 2008 Jesse is an incredibly talented designer. He has a knack for transforming even the most mundane requirements into something beautiful. Dave Greiner Campaign Monitor | MOBILE WEB DESIGN August 2007 Jesse is one of the most gifted and sought-after web designers on the planet. I have no reservation entrusting him with my projects. Cameron Moll Cameron Moll Inc. | GLOBE INVESTOR February 2009 What sets Jesse apart is his ability to really hear and understand what is required and from that, produce beautiful work. Mike Pletch The Globe & Mail |
|--|--|---|

(CREATIVITY BOTTLED FRESH DAILY)

Hosted by EngineHosting.com | Powered by ExpressionEngine | Twitter | RSS

Kumar, R., et al., CHI 2011

Training machine algorithms

Create Mapping

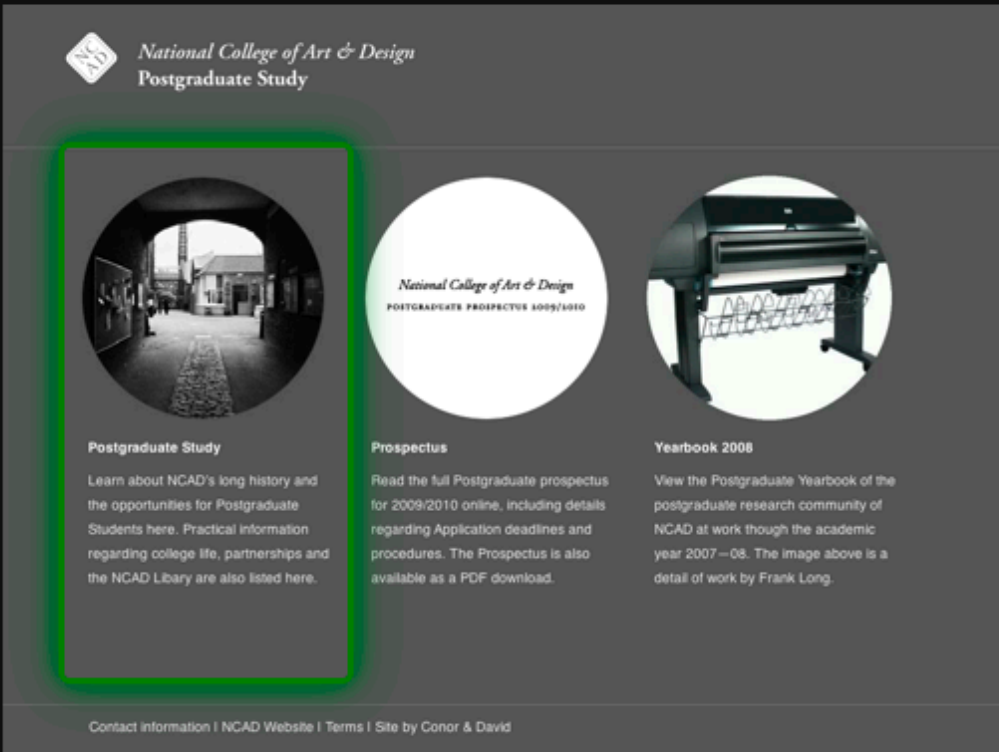
http://bricolage.stanford.edu/app/?turkId=9999

Bing

Create Mapping

Map Webpages For the highlighted segment on the left-hand page, find the best corresponding segment on the right-hand page (3 of 18)

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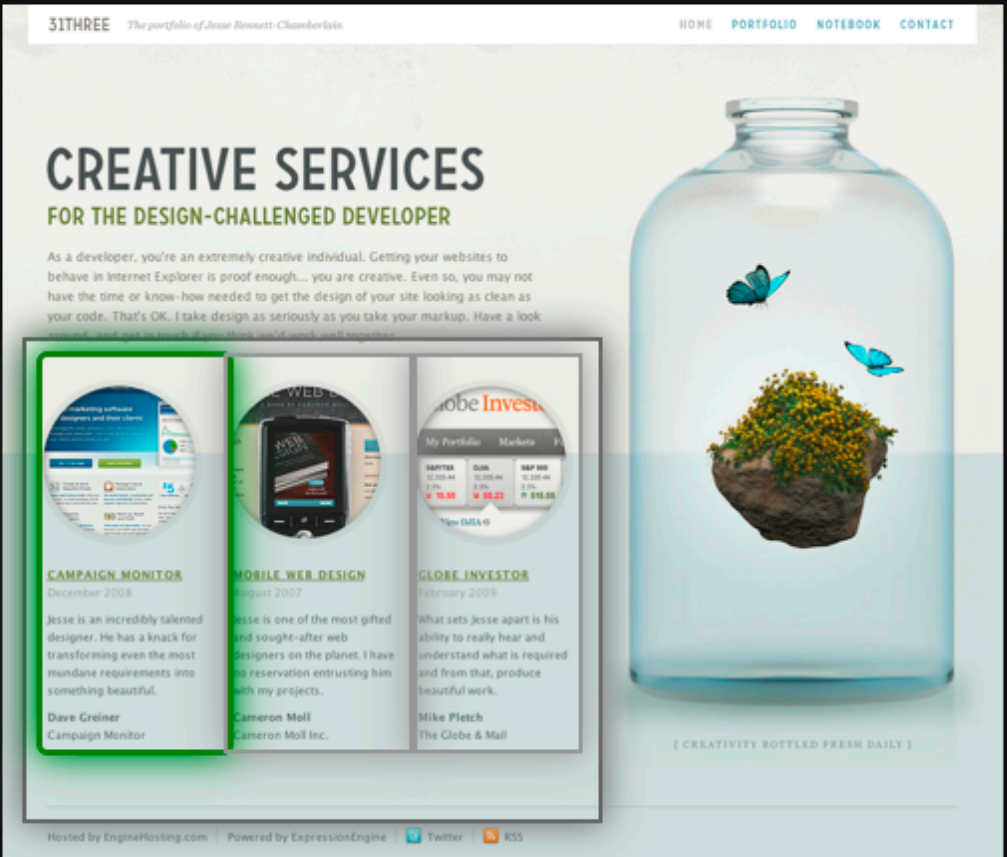
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CAMPAIGN MONITOR
December 2008
Jesse is an incredibly talented designer. He has a knack for transforming even the most mundane requirements into something beautiful.
Dave Greiner
Campaign Monitor



MOBILE WEB DESIGN
August 2007
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Cameron Moll
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31THREE *The portfolio of Jesse Bennett-Chamberlain*


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 **MARKETING SOFTWARE**
Developing software designers and their clients.

 **MOBILE WEB DESIGN**
August 2007
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Mike Pletch
The Globe & Mail

 (CREATIVITY BOTTLED FRESH DAILY)

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http://bricolage.stanford.edu/app/?turkId=9999


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The grid shows three project thumbnails: 'CAMERON MONITOR' (highlighted), 'MOBILE WEB DESIGN', and 'GLOBE INVESTOR'. The 'CAMERON MONITOR' description reads: 'Jesse is an incredibly talented designer. He has a knack for transforming even the most mundane requirements into something beautiful.' Below it are the names 'Dave Greiner' and 'Cameron Moll'.


A large glass bottle containing a small globe with yellow flowers and blue butterflies. Below it is the text '(CREATIVITY BOTTLED FRESH DAILY)'.

Hosted by EngineHosting.com Powered by ExpressionEngine Twitter RSS

Gathering human judgments

serial
prototyping
condition



parallel
prototyping
condition



Dow, S.,
et al.,
toCHI
2011



Site Usage

 **16,107 Visits**
Dec 1, 2006 - Dec 31, 2006: 13,209 (21.94%)

 **62,142 Pageviews**
Dec 1, 2006 - Dec 31, 2006: 53,855 (15.39%)

 **3,86 Pages/Visit**
Dec 1, 2006 - Dec 31, 2006: 4.08 (-5.37%)

 **00:03:22 Avg. Time on Site**
Dec 1, 2006 - Dec 31, 2006: 00:03:31 (-4.27%)

 **36,81% Bounce Rate**
Dec 1, 2006 - Dec 31, 2006: 35.98% (2.30%)

 **50.44% % New Visits**
Dec 1, 2006 - Dec 31, 2006: 49.73% (1.42%)

Visitors Overview



Visitors
10,160

Map Overlay world



Traffic Sources Overview



Browsers

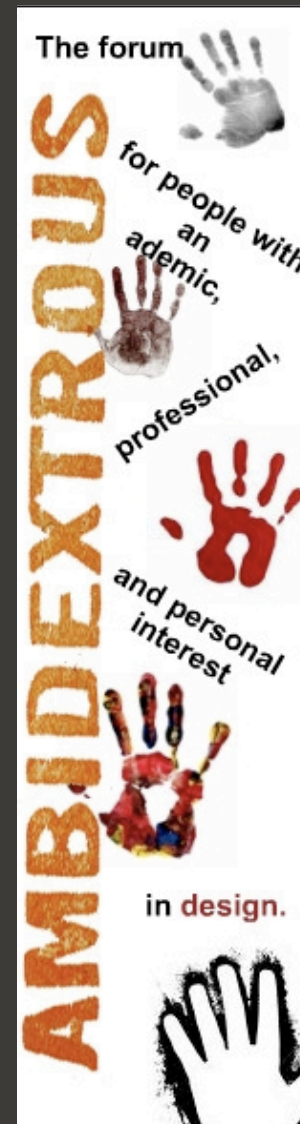
| Browser | Visits | % visits |
|---------|--------|----------|
|---------|--------|----------|

Gathering human judgments

How **similar** are these two advertisements?

Not at all (0) - very similar (7)

Dow, S., et al., toCHI 2011



Crowdsourcing in HCI research

- Surveys or questionnaires
- Data labeling/categorization
- Usability studies or experiments
- Machine learning training data
- Judgments on content

Search for containing

Timer: 00:00:00 of 10 minutes

Copy Text from Business Card

Requester: Oscar Smith

Qualifications Required: None

Please Copy Text from Business

mturk.com



Project Oscar

Please Accept HIT First

123 Arrowhead Ave.
Westborough, CO 12345

Oscar S
Lead Research

f - (213)233-1950

(213)

How it Works

Hire

Find W

Hire contractors or bring your own



Graphic Design Contractors

43,30
criteria

oDesk.com



Andrey Sazonov

Certified 3D designer and instructo

Skills: 3D Design, Graphics, Photoshop, Recruiting



\$16.67/hr - Hours: 1,937 - Ukraine - Last acti

MTurk + Qualtrics + Dropbox

demo of Mechanical Turk

Three key ways to interact with Amazon's Mechanical Turk

- Launch a canned template
- Post a link (new browser window)
- Embed content in iframe

Search for containing

Timer: 00:00:00 of 10 minutes

Copy Text from Business Card

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\$16.67/hr - Hours: 1,937 - Ukraine - Last acti

First, please read this customer review:

Product: Samsung - Samsung R355C

Great phone for the price

I decided to switch over to Walmart's Straight Talk service after becoming fed up with having to pay for data plans that I wasn't using! I chose the Samsung R355C due to its qwerty keyboard being right up front and visible. There's no need to slide, open or do anything else to your phone to get to the keys and I love that! It's not a smart phone by any means but if you use your phone to talk and text (and your plan as well), I would highly recommend both the phone and the service!

Second, please assess the work above:

Answer each question carefully. Check all that are true:

- Does this consumer review include personal stories/anecdotes?
- Does this consumer review list good and bad aspects of the product?
- Does this consumer review compare the product to others?
- Does this consumer review assess the product's value given its price?
- Does this consumer review mention the product's name/model?
- Does this consumer review have perfect spelling and grammar?
- Does this consumer review use appropriate punctuation and capitalization?
- Is this consumer review the right length (1-2 paragraphs)?
- Is this consumer review useful?

How effective is this customer review?

- 9 Excellent
- 8
- 7 Very Good
- 6
- 5 Acceptable
- 4
- 3 Borderline
- 2
- 1 Poor

Submit

Copywriting Contractors

47,372 Contractors were found based on your criteria.

Modify by: [more ...](#)

Keywords:

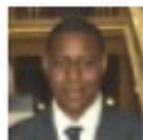
[Search Contractors](#)

Keep filter selections [New Search](#)

[Contact multiple contractors](#)

[My Saved Contractors](#)

[« Previous](#) [1](#) [2](#) [3](#) ... [499](#) [500](#) [Next »](#)



Marc M.

Talented All-Rounder (Legal Consultant/Freelance Writer)

Skills: [Writer](#), [Legal Research Skills](#), [Proof Reading/Editing](#)



\$33.33/hr - **Hours: 165** - **Jamaica** - Last active: Jun 11, 2011 - Tests: [10](#) - Portfolio: [7](#)



Save

I am a lawyer AND I am a writer. Yes it is possible to be both. Qualifications: 1. I am admitted to practice law before the State Bar of Wisconsin. 2. I have a JD from an ABA accredited law school located in the US. 3. I have a Legal Education Certificate that makes me eligible to practice law in various Caribbean Jurisdictions. 4. Two years of legal work experience 5. Many years of writing experience Legal Services: Contract ... [more](#)

Associated with:
[M Process](#)



Richard Carlile

Expert Ecommerce Consultant, Instructional Designer, Technical Writer

Skills: [Adobe Products](#), [Instructional Design](#), [Technical Writing](#), [Marketing Communication](#), [more...](#)



\$27.78/hr - **Hours: 2,096** - **Taiwan** - Last active: Today - Tests: [3](#) - Portfolio: [26](#)

Associated with:
[Creadyne](#)

Review product reviews written by others

[Repost Job](#) [Make Private](#)

Closed - This job posting has been filled and work has been completed.

Job Description

You will assess 380 consumer reviews written by other people. Please read each review carefully. For each assessment, click checkboxes for 9 simple questions about the review and provide a numerical score. Please see the attached screenshot for an example. The important thing is that we need this work within the next 24 hours.

[Open Attachment](#)

Preferred Qualifications:

Feedback Score: At least 4.00
English Level: Fluent in written, good verbal skills
oDesk Hours: At least 1 hour

Employer Activity on this Job:

Last Viewed: Jun 02, 2011
Applicants: 6 (avg \$92.59)
Hired: Jodi H.

Job Overview

Type: Fixed-Price
Budget: \$100.00
Posted: June 1, 2011
Planned Start: Immediately
Delivery Date: June 2, 2011
Visibility: Public

Category: [Writing & Translation](#)
Sub-Category: [Other - Writing & Translation](#)

About the Employer

Stanford University

[< Back To Job Postings](#)

Review product reviews written by others (Fixed-price - CLOSED - View/Edit)

Archived



Penny Jones - Business Administration/Medica/Data Entry/Customer Service

oDesk Hours: 167 - Feedback: 4.12 - **United States** - Tests: 6 - Portfolio: 4 - All Qualifications Match 🔍

[★ Save](#)

Declined by Employer
Jun 2 (14 days ago)



Jodi Hilow - Word Artisan

Skills: Customer Service

NEW to oDesk - Feedback: 5.00 - **United States** - Tests: 17 - Portfolio: 1 - 1 of 3 qualifications 🔍

[★ Save](#)

Hired - View Contract
Jun 2 (14 days ago)



Shiela Mae - Certified CREATIVE WRITER, ARTICLE WRITER, and COPY EDITING Expert

Skills: Copy Editing, Copywriting, Creative Writing

oDesk Hours: 576 - Feedback: 4.89 - **Philippines** - Tests: 4 - Portfolio: 2 - All Qualifications Match 🔍

[★ Save](#)

Declined by Employer
Jun 2 (14 days ago)



andrew langat - writer:Articles,rewrites,ebooks,webcontent,internet research,cisco

Skills: Microsoft Excel, Microsoft Word, Technical Writing, Article Writing, Internet Research...

oDesk Hours: 21 - Feedback: 4.80 - **Kenya** - Tests: 10 - Portfolio: 5 - All Qualifications Match 🔍

[★ Save](#)

Declined by Employer
Jun 2 (14 days ago)



Clark T - Web Developer/Data Entry Professional

Skills: Computer literacy, Customer Service, Hardware Troubleshooting, Programming in C, C#, PHP, HTML, MYSQL

NEW to oDesk - No Feedback - **Philippines** - Tests: 4 - Portfolio: 0 - 1 of 3 qualifications 🔍

[★ Save](#)

Declined by Employer
Jun 2 (14 days ago)



Estella S - Quality writing with fast turnaround

Declined by Employer

[Contracts](#) » **Detail****Jodi Hilow** (jihilow1)[View profile](#) | [View Work Diary](#) | [Send a message](#)

2:00 pm Tulsa, United States (UTC-06:00)

Assess product reviewsENDED - 06/01/2011 - 06/02/2011 - [Rehire](#)Contract ID#11409038 ([View original job posting](#))**Feedback****Feedback to Contractor (Jodi Hilow)**

Great job Jodi. You earned full payment and five stars across the board!

► **Score:** ★★★★★ 5.00

Feedback to Employer

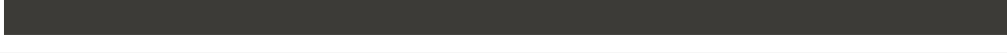
Mr. Dow of Stanford University was prompt in responding to any questions, was courteous, and was respectful. The project description was easy to understand and to complete. The only thing that was a challenge was that deadline was a bit rushed. Even so, I was able to complete the project on time and with adequate results. Payment was posted to my account as soon as Mr. Dow reviewed the completed project --- the same day. All in all, I would recommend working with Stanford University to anyone. I am very pleased.

► **Score:** ★★★★☆ 4.15

[Enable contractor to change feedback](#)[Make contractor's comment private](#)**Terms****Payments Made**

Research ***about***
crowdsourcing

**work
complexity**



skill level

**work
complexity**

simple,
transactional

novice



skill level

**work
complexity**

creative,
multi-faceted

simple,
transactional



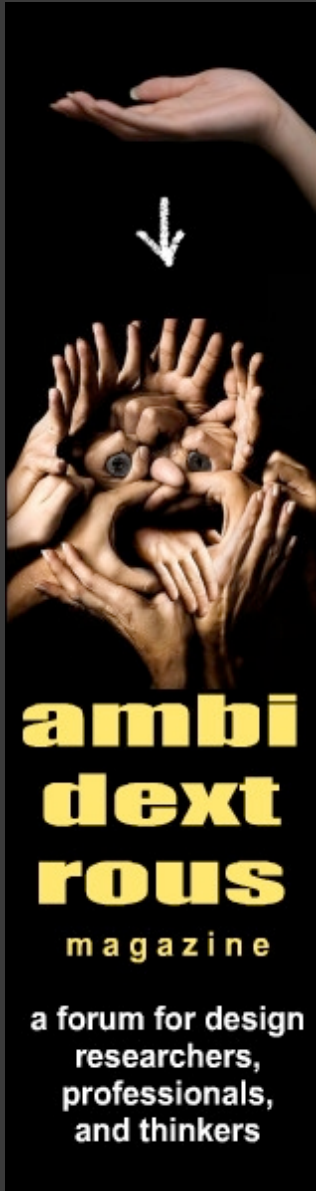
novice

expert

skill level




ads



**ambi
dext
rous**
magazine

a forum for design
researchers,
professionals,
and thinkers

product reviews



Nikon D3100 14.2MP Digital SLR Camera with 18-55mm f/3.5-5.6 AF-S DX VR Nikkor Zoom Lens
by [Nikon](#)
★★★★☆ (188 customer reviews) | [Like](#) (432)

Price: **\$649.00** & this item ships for **FREE with Super Saver Shipping**. [Details](#)

In Stock.
Ships from and sold by **Amazon.com**. Gift-wrap available.

Want it delivered Tuesday, May 3? Order it in the next 2 hours and 26 minutes, and choose **One-Day Shipping** at checkout. [Details](#)

[12 new](#) [15 used](#) from \$569.00 [3 refurbished](#) from \$640.00

587 of 600 people found the following review helpful:

★★★★★ **Nikon D3100 VS. D300 VS. D700**, September 23, 2010

By [Michael Allebach "Allebach Photography"](#) (Philadelphia, Pa) - [See all my reviews](#)

This review is from: Nikon D3100 14.2MP Digital SLR Camera with 18-55mm f/3.5-5.6 AF-S DX VR Nikkor Zoom Lens (Electronics)

For the cost of this camera, I don't think you can get anything better. The low light performance is off the charts. As a wedding photographer I regularly shoot with Nikon's high end professional equipment and I was amazed how close this camera is to a pro camera. Now let me get specific. In order to compare I took a look at 100% files out of each camera I own.

Which camera excels Nikon D3100(\$Cheap) VS. D300(\$1600) VS. D700 (\$2,700):

- * Lens = The D3100 is the only camera that comes with a lens at it's normal price
- * ISO Performance = Tie between D3100 and D700! (It could be Nikon's new processing but the JPEG looks fantastic I was shooting D3100 on 6400iso with very little noise at all)
- * Low Light Focusing = D700
- * Focus Speed = D700
- * External Buttons & Controls for Pros = D700
- * Menu Navigation = D3100
- * Ease of Use = D3100
- * Megapixel = D3100 (14.2)
- * Sensor size = D700 (Much more important than megapixels but I won't get into this)
- * Can use older lenses with functionality = D700 & D300

work complexity

creative,
multi-faceted

??



simple,
transactional



novice

expert

skill level

**work
complexity**

creative,
multi-faceted

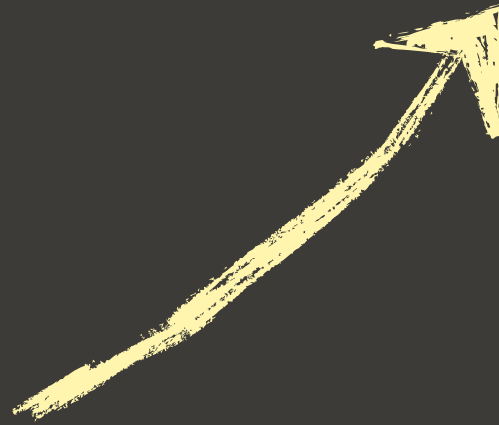
simple,
transactional



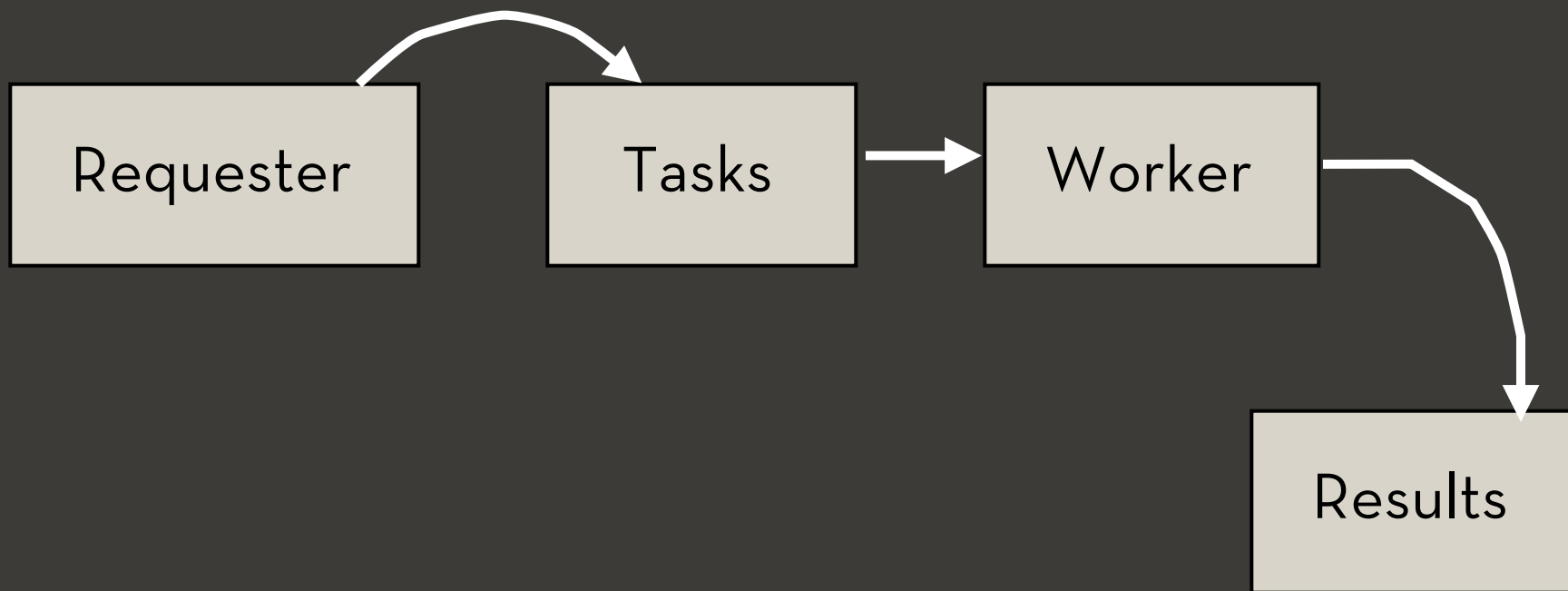
novice

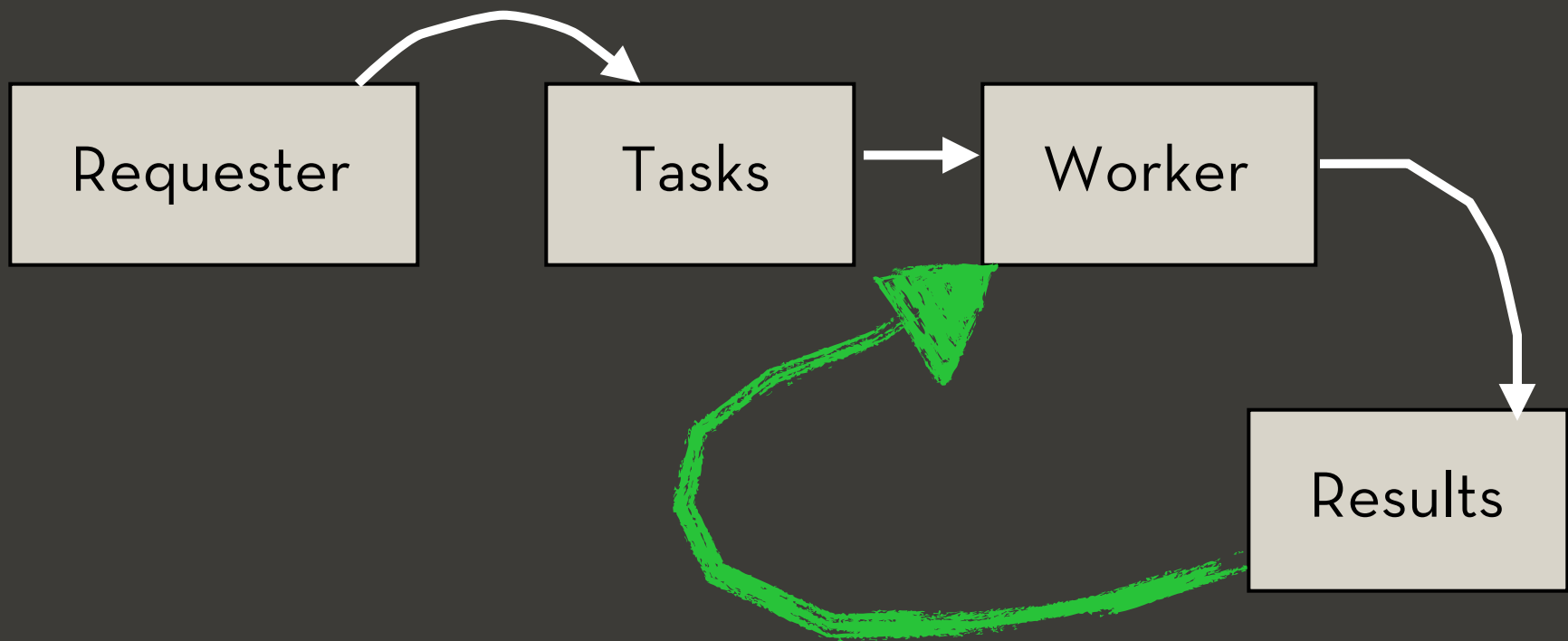
expert

skill level



shepherding the crowd





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