



Advancing Collective Innovation

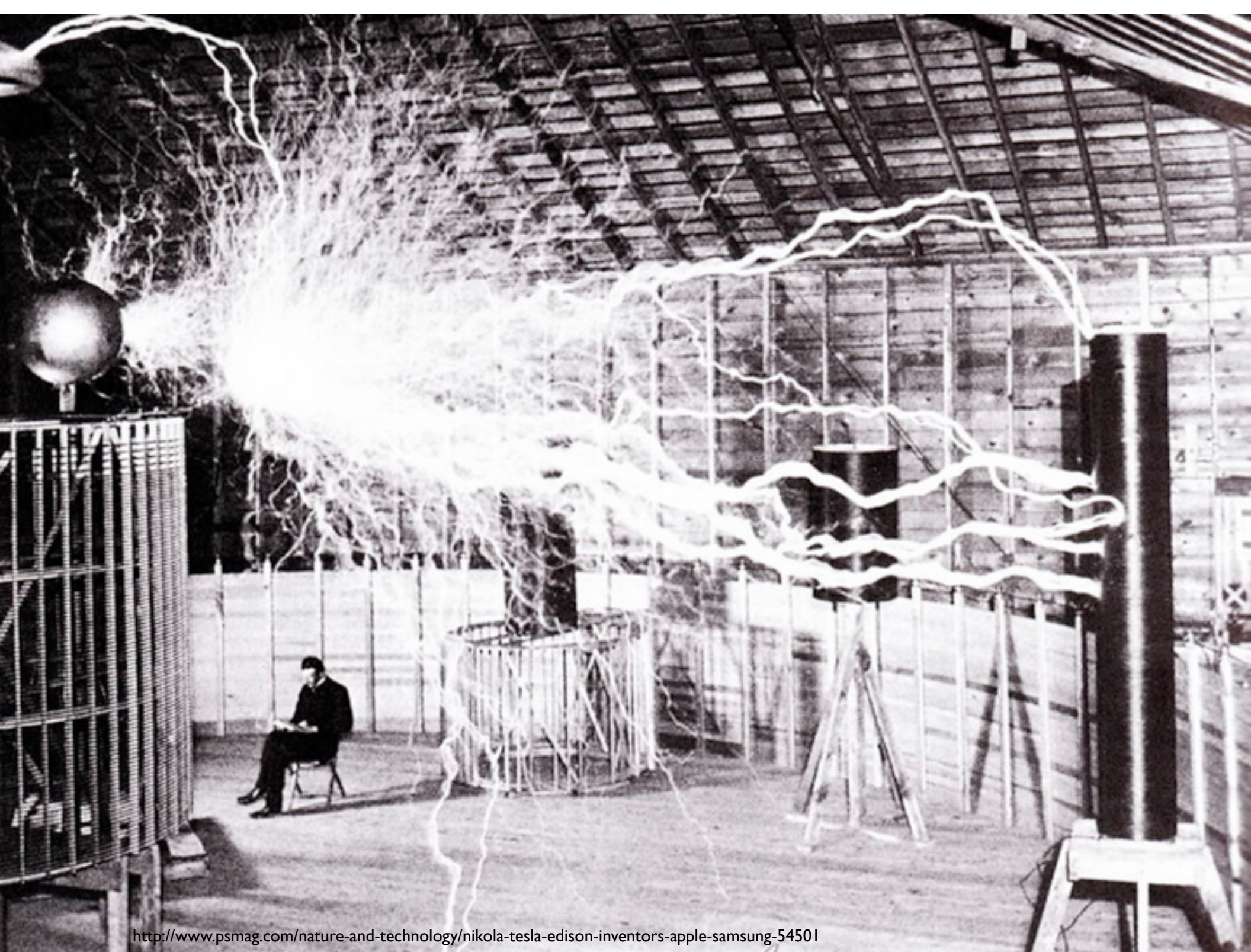
Steven Dow

Associate Professor
Cognitive Science
UC San Diego

PROTOLAB

UC San Diego
The Design Lab







WIKIPEDIA

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GALAXY ZOO.org



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Galaxy Tutorial

Galaxy Analysis

Galaxy Zoo - Thank You

Show My Galaxies

Galaxy Analysis

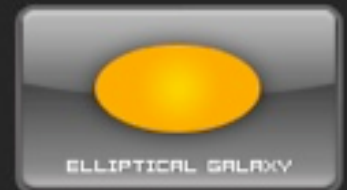
Welcome to Galaxy Zoo's view of the Universe. If you're here you should already have seen the [Tutorial](#), but feel free to go and remind yourself. There's no need to agonise for too long over any one image, just make your best guess in each case.



Galaxy Ref:

587729387677679742

Choose the Galaxy Profile by clicking the buttons below



Show Grid Overlay on the next Image

▼ Dr. David Baker



Several **sheets** are lining up in this protein, but one is out of place. Pull the misaligned **sheet** back in to form **hydrogen bonds**! Don't forget you can control-click to lock, and use Shake and Wiggle.

Repeat Introduction

Clear Labels

Progress: of 10000

Level 4-2: A Sheet Out of Place

▶ Chat



Shake Sidechains Wiggle Backbone Clear Locks Reset Puzzle

▲ Actions ▶ History ▶ File

🗑 Pull Tool

Supporting Collective Innovation

How can we harness collective intelligence, effort, and creativity to innovate on complex problems?





	X01 D	X02 E	X03 F	X04 G	X05 A	X06 B	X07 C	X08 Q	X09 H	X10	X10 J	X11 K	X12 L	X13 M	X14 N	X15 O	P x110 S165
Thursday	Award talks 2400	421 Int. Tech. + Dev.	Panels 481	452	424	Larger courses 207	Larger courses 207	424	257	219	400	400	393	Smaller courses 47	Smaller courses 40	Smaller courses 70	
9:30-10:50	Award lecture 1201	TOUCHTEXT ENTRY 1202	Panel-110 "Material Interactions" - From Atoms & Bits to Entangled Practices 1203 Michael Wherry, Steve Ishii, Davide Ruscio, Arno Vogels, Paul Dourish, Peter Sander, Tobias Strödel, Mark Reiskie	DO YOU SEE WHAT ORGANS IN THE EYE SEE? 1204	1205	cr124 From Discourse-based Models to UIs Automatically Optimized for Your Smartphone 1206 Hermann Kaindl	cr102 Agile User Experience and UCD 1207 William Hudson	TEACHING WHEN INTERFACES 1208	INTERACTIONS BEYOND THE DESKTOP 1209	1210	ALRIGHT HERE I AM UX IN COMPLEX ENVIRONMENTS 1211	HEALTH+CHILDREN 1212 alt.chi	cr125 Cognitive Crash Dummies: Predicting Performance from Early Prototypes 1213 Bonnie E. John	cr147 Designing for Persuasion 1214 Aaron Marcus	S16 1215	S16 1216	
11:30-12:50	Video 1301	BILLER TOGETHER: LARGE & MULTIPLE DISPLAY ENTIREMENT 1302	Panel-116 Politics, Power, and Passion: Engaging U.S. Policymakers 1303 Janet Davis, Harry Hochheiser, Juan Pablo Hourcade, Jeff Johnson, Lisa P. Norman, Janice Tsai	HOW MANY MOBILE GESTURES? 1304	1305	1306 CR 124 Kaindl	1307 CR 102 Hudson	BETTER TOGETHER 1308	ME ANY MOBILE 1309	1310	UNDERSTANDING GAMERS 1310	1311 alt.chi 1312	CR 105 Unit 2 1313 Bruni John	cr139 Methodology for Evaluating Experience of Mobile Applications Used in Different Contexts of Daily Life 1314 Katarzyna Wac	S16 1315	S16 1316	
14:30-15:50	1400	USE THE FORCE 1401	Panel-101 How-to-guide: Collaborating with executives in a pro-design world 1403 Janice Lee, Chris Maloney, Sam Miller, Mark Reiskie, Craig Williams, Lamy Zhang	GIVES US FITS? 1404	1405	cr135 1406 Selecting UCD Methods that Maximize Benefits and Minimize Project Risks 1407 Nigel Bevan	cr127 1407 Putting Conceptual Models to Work 1408 Austin Henderson	CREATIVITY 1409	PROGRAMMING PERFORMANCE & SENSE MAKING 1410	1411	1411 1412 S16	1413 S16	cr139 Unit 2 1414	1415 S16	1416 S16		

Wicked problems (Rittel and Webber 1973)



A problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements.

Wicked problems (Rittel and Webber 1973)

- The solution depends on how the problem is framed and vice versa (i.e., the problem definition depends on the solution).
- Stakeholders have radically different world views and different frames for understanding the problem.
- The constraints that the problem is subject to and the resources needed to solve it *change* over time.
- The problem is never solved definitively.

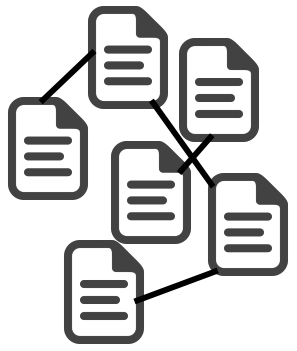


CONFERENCE
CHAIRS

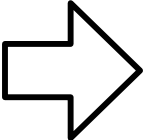




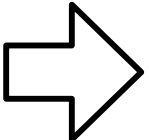
CONFERENCE
CHAIRS



PROGRAM COMMITTEE
~200 PEOPLE

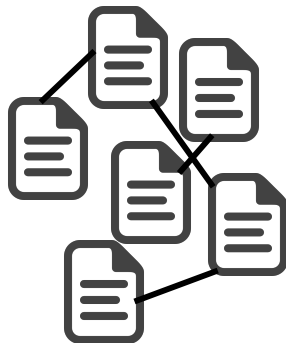


AUTHORS
~1000 PEOPLE



ATTENDEES
~3500 PEOPLE





PROGRAM COMMITTEE
~200 PEOPLE

Paper List

Need your help:

- papers not in any valid sessions
- papers not in an approved session
- papers in < 2 approved sessions

Keyword:

Showing 5 papers

[Show all papers](#)

See all: authors abstracts keywords sessions

Test Paper 1: How to write a good paper
test001

John Smith, *University of Testing*
Jane Smith, *University of Testing*

Abstract: Abstract for test paper 1 goes here.
crowdsourcing

My Workspace

Sessions in my workspace: 2

mysession

approve delete

Test Paper 1: How to write a good paper test001

Test Paper 2: How to write a good paper test002

makers: Anonymous

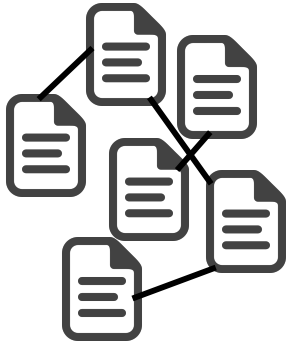
better session

approve delete

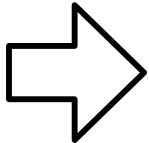
Test Paper 2: How to write a good paper test002

makers: Anonymous

Community Clustering: Leveraging an Academic Crowd To Form Coherent Conference Sessions, Paul André, Haoqi Zhang, Juho Kim, Lydia Chilton, Steven P. Dow and Rob Miller. AAI Conference on Human Computation and Crowdsourcing, 2013. (Notable Paper Award)



PROGRAM COMMITTEE
~200 PEOPLE



AUTHORS
~1000 PEOPLE

Your Paper: *Revising Learner Misconceptions Without Feedback: Prompting for Reflection on Anomalous Facts*

1. Tell us your name: (as it appears in the paper)

2. We've identified 10 papers that may be similar to yours. Tell us how they would fit in a session with your paper:

It's Creepy, But it Doesn't Bother Me [\[abstract\]](#)

- Great in same session
- Okay in same session
- Not sure if it should be in same session
- Should not be in same session

Learning From the Crowd: Observational Learning in Crowdsourcing Communities [\[abstract\]](#)

- Great in same session
- Okay in same session
- Not sure if it should be in same session
- Should not be in same session

Participatory Design through a Learning Science Lens [\[abstract\]](#)

- Great in same session
- Okay in same session
- Not sure if it should be in same session
- Should not be in same session

Community Clustering: Leveraging an Academic Crowd To Form Coherent Conference Sessions, Paul André, Haoqi Zhang, Juho Kim, Lydia Chilton, Steven P. Dow and Rob Miller. AAI Conference on Human Computation and Crowdsourcing, 2013. (Notable Paper Award)

Conflicts 66

High severity (20)
 ■ authors with papers in opposing sessions (0)
 ■ papers of mutual interests in opposing sessions (20)

Medium severity (46)
 ■ papers that don't fit well in the same session (42)
 ■ topics of interest to a persona in opposing sessions (4)

Preferences 269

■ papers that are good in the same session (269)

View Options

- Conflicts
- Preferences
- Session Type
- Number of Papers
- Duration
- Awards
- Honorable Mentions

Session Types

Personas

Communities

History 1

✓ You unscheduled paper: *The Many Faces of Facebook: Ex...* from *Managing Social Media*

Unscheduled Sessions 11



Unscheduled Papers 1



Room/Time	Blue	Bordeaux	252B	352AB	Havane	241	342A	251	351	242A	242B	243	253	343	252A	361
Mon 11:00-12:20	Managing Social Media	Lifetime Research Award	Call All Game Changers:	Multitouch and Gesture	3D User Interfaces	Reflection and Evaluation	Interaction in the Wild	Learning	Crowdsourc People Power	Enhancing Access		User Interface Design and	Six Steps to Successful UX in an	Rapid Design Labs -A Tool to	Body, Whys & Videotape:	Designin Interactiv Secure
Mon 14:00-15:20	Will Massive Online +5 ■ +5	Language and Translation +2 ■ +2	Gaze +2 ■ +2	Flexible Displays +4 ■ +3 ■ +1	Crowdwork and Online Communities +2 ■ +2	Co-Design with Users +4 ■ +3 ■ +1	Brain Sensing and Analysis +1 ■ +2 ■ -1	Evaluation Methods 1 +1 ■ +1	Keyboards and Hotkeys +1 ■ +4 ■ -3	Technologies for Life 1 +8 ■ +7 ■ +1		Practical Statistics for User +2 ■ +2	Agile User Experience and UCD +2 ■ +2	Rapid Design Labs -A Tool to +2 ■ +2	Speech-based Interaction: +2 ■ +2	+2 ■
Mon 16:00-17:20	Smart Tools, Smart Work +4 ■ +5 ■ -1 ■ -2	Tables and Floors +7 ■ +6 ■ +1 ■ -5	Leveraging the Progress of +5 ■ +5	Embodied Interaction 1 +6 ■ +6 ■ -6	Crowds and Activism +2 ■ +2 ■ -1	Innovating User-Centered +5 ■ +5	Design for Classrooms 1 +9 ■ +9 ■ -4	Exploring Games +10 ■ +10 ■ -3	Large and Public Displays +6 ■ +7 ■ -1 ■ -1	Creating and Authoring +6 ■ +6 ■ -1		Practical Statistics for User +5 ■ +5	Agile User Experience and UCD +5 ■ +5	Rapid Design Labs -A Tool to +5 ■ +5	Speech-based Interaction: +5 ■ +5	+5 ■
Tue 9:00-10:20	Interacting around Devices +2 ■ +1 ■ +1 ■ -4	Design for Classrooms 2 +4 ■ +4 ■ -4	CHI at the Barricades - an Activist	Manipulating Video +1 ■ +1 ■ -6	Technologies for Life 2 0 ■ -1 ■ -3	Experiences -2 ■ -1 ■ -1	Reflecting on Phones -1 ■ -2 ■ +1 ■ -1	Social Creativity +1 ■ +1	Gesture Studies +7 ■ +6 ■ +1 ■ -5	Design for the Home +2 ■ +2		User Experience Evaluation	Choice and Decision Making for	Cognitive Crash Dummies: -1 ■ -1	Analyzing Social Media Data -1 ■ -1	Consum Engagem in Health +2 ■
Tue 11:00-12:20	Sustainable Energy -1 ■ -1 ■ -4	Full-Body Interaction -2 ■ -1 ■ -1 ■ -2	UX Management Current and +1 ■ +2 ■ -1	Sensing Touch +2 ■ +2 ■ -4	Ideation Methods 0 ■ +1 ■ -1 ■ -2	Communities of Practice -2 ■ -1 ■ -1	Video Communicat -1 ■ -1 ■ -4	Exergames and Beyond +3 ■ +3 ■ -2	Pointing and Fitts Law +4 ■ +4 ■ -5	Impairment and Rehabilitation -1 ■ -1 ■ -5		User Experience Evaluation -1 ■ -1	Choice and Decision Making for -1 ■ -1	Cognitive Crash Dummies: -1 ■ -1	Analyzing Social Media Data -1 ■ -1	Research Practice Interactio 0 ■
Tue 14:00-15:20	Displays Everywhere 0 ■ +2 ■ -2 ■ -2	Design for the Home +2 ■ +2 ■ -1	Is My Doctor Listening to +2 ■ +2	Tactile Experiences +2 ■ +2 ■ -3	Social Impact Award +1 ■ +1	Changing How We Work +2 ■ +2	Novel Programmin +2 ■ +2 ■ -2	Game Design +12 ■ +11 ■ +1 ■ -4	Temporal Design +1 ■ +1 ■ -2	Clinical Settings -1 ■ -1 ■ -3		Practical Statistics for User +1 ■ +1	Expert Reviews - For Experts +1 ■ +1	Make This! Introduction to +1 ■ +1	Card Sorting for Navigation +1 ■ +1	SIG: NVI (Non-Vis Interactio +1 ■
Tue 16:00-17:20	Public Displays +1 ■ +1	Ethics in HCI +1 ■ +1	Gamification @ Work	Collaborativ Creation +3 ■ +3	Design Research +2 ■ +2	Studying Digital Artifacts +3 ■ +3	Embodied Interaction 2 +1 ■ +2 ■ -1	Reading and Writing +3 ■ +2 ■ +1	Developing the World +1 ■ +1	Communicat Health +4 ■ +3 ■ +1		Practical Statistics for User	Expert Reviews - For Experts	Make This! Introduction to	Card Sorting for Navigation	HCI with Sports

Cobi: A Community-Informed Conference Scheduling Tool, Juho Kim, Haoqi Zhang, Paul André, Lydia B. Chilton, Wendy Mackay, Michel Beaudouin-Lafon, Robert C. Miller, and Steven P. Dow. In Conference on User Interface Software and Technology, 2013.



ATTENDEES
~3500 PEOPLE





pre 2014



2014 -

Discovering constraints at scale

Deployments:

Conference on Computer-Human Interaction (CHI) 2013-2016

Conference on Computer-Supported Cooperative Work (CSCW) 2014-2015

Research papers:

Cobi: A Community-Informed Conference Scheduling Tool, Juho Kim, Haoqi Zhang, Paul André, Lydia B. Chilton, Wendy Mackay, Michel Beaudouin-Lafon, Robert C. Miller, and Steven P. Dow. In Conference on User Interface Software and Technology, 2013.

Community Clustering: Leveraging an Academic Crowd To Form Coherent Conference Sessions, Paul André, Haoqi Zhang, Juho Kim, Lydia Chilton, Steven P. Dow and Rob Miller. AAI Conference on Human Computation and Crowdsourcing, 2013. **(Notable Paper Award)**

Frenzy: Collaborative Data Organization for Creating Conference Sessions, Lydia Chilton, Juho Kim, Paul André, Felicia Cordeiro, James A. Landay, Daniel S. Weld, Steven P. Dow, Robert C. Miller, and Haoqi Zhang. CHI, 2014. **(Honorable Mention Award)**

Collaborators:



Supporting Collective Innovation

How can we harness collective intelligence, effort, and creativity to innovate on complex problems?

Wicked problems (Rittel and Webber 1973)

CI

Wicked problems (Rittel and Webber 1973)

CI

C2

Wicked problems (Rittel and Webber 1973)

C3

C1

C2

Wicked problems (Rittel and Webber 1973)

C3

C4

C1

C2

Wicked problems (Rittel and Webber 1973)



Wicked problems (Rittel and Webber 1973)





MY MIND
SOME IS
JUST FINE

MY MIND
IS MY BEST
FRIEND

I WANT TO
BE A MATHS
TEACHER

THROUGH
THE MATHS
PROBLEMS

THEY
ARE
MY
BEST
FRIENDS

MY MATHS
TEACHER
IS MY
BEST
FRIEND

MY MATHS
TEACHER
IS MY
BEST
FRIEND

We need
to come
back/give
back to
Community

WE NEED
TO COME
BACK/GIVE
BACK TO
COMMUNITY

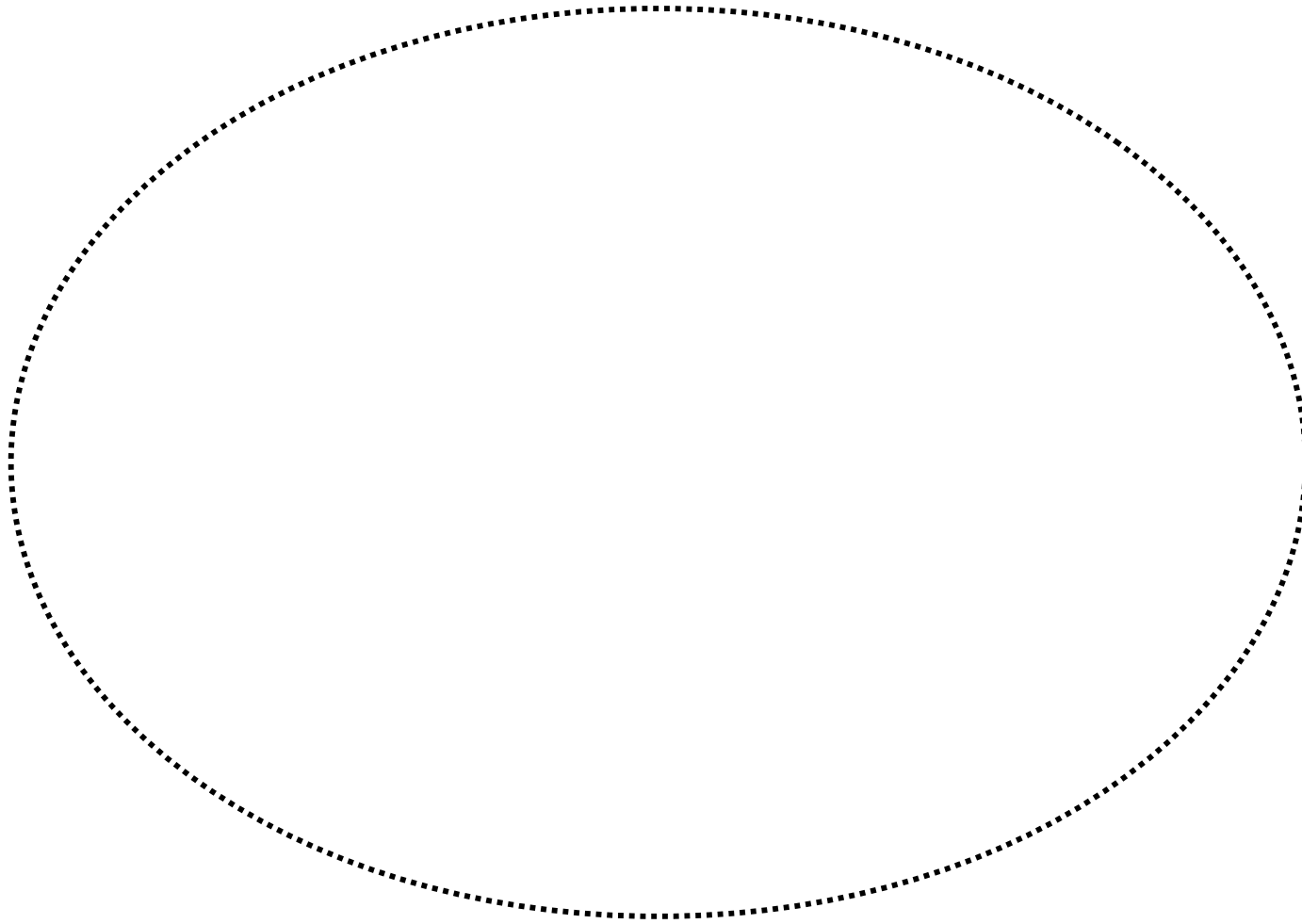
WE NEED
TO COME
BACK/GIVE
BACK TO
COMMUNITY

WE NEED
TO COME
BACK/GIVE
BACK TO
COMMUNITY

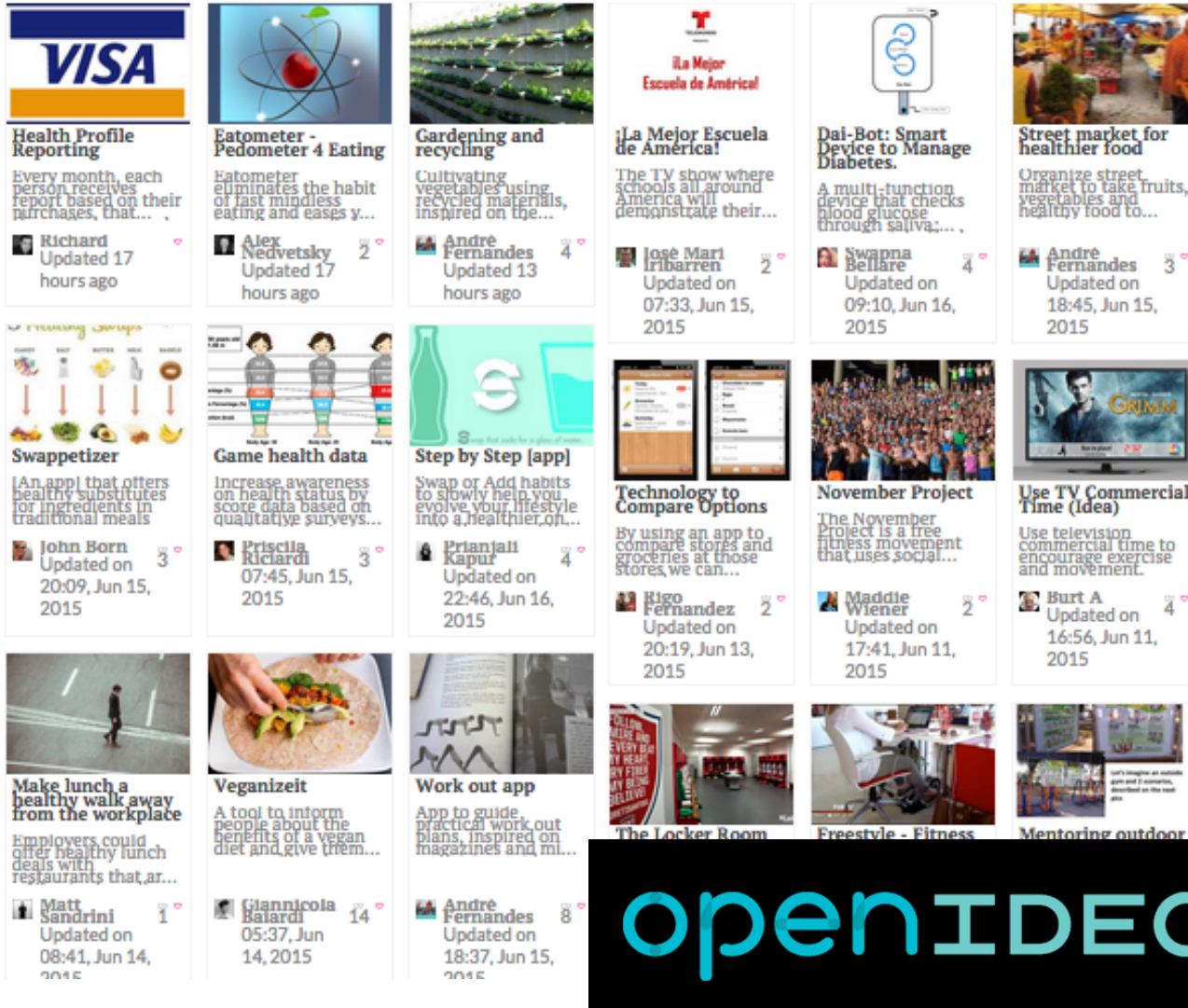
WE NEED
TO COME
BACK/GIVE
BACK TO
COMMUNITY

WE NEED
TO COME
BACK/GIVE
BACK TO
COMMUNITY

Independent teams only gain insight on a portion of the “design space”



Harvesting design inspiration from examples



CupClub - Join the Reusable Revolution

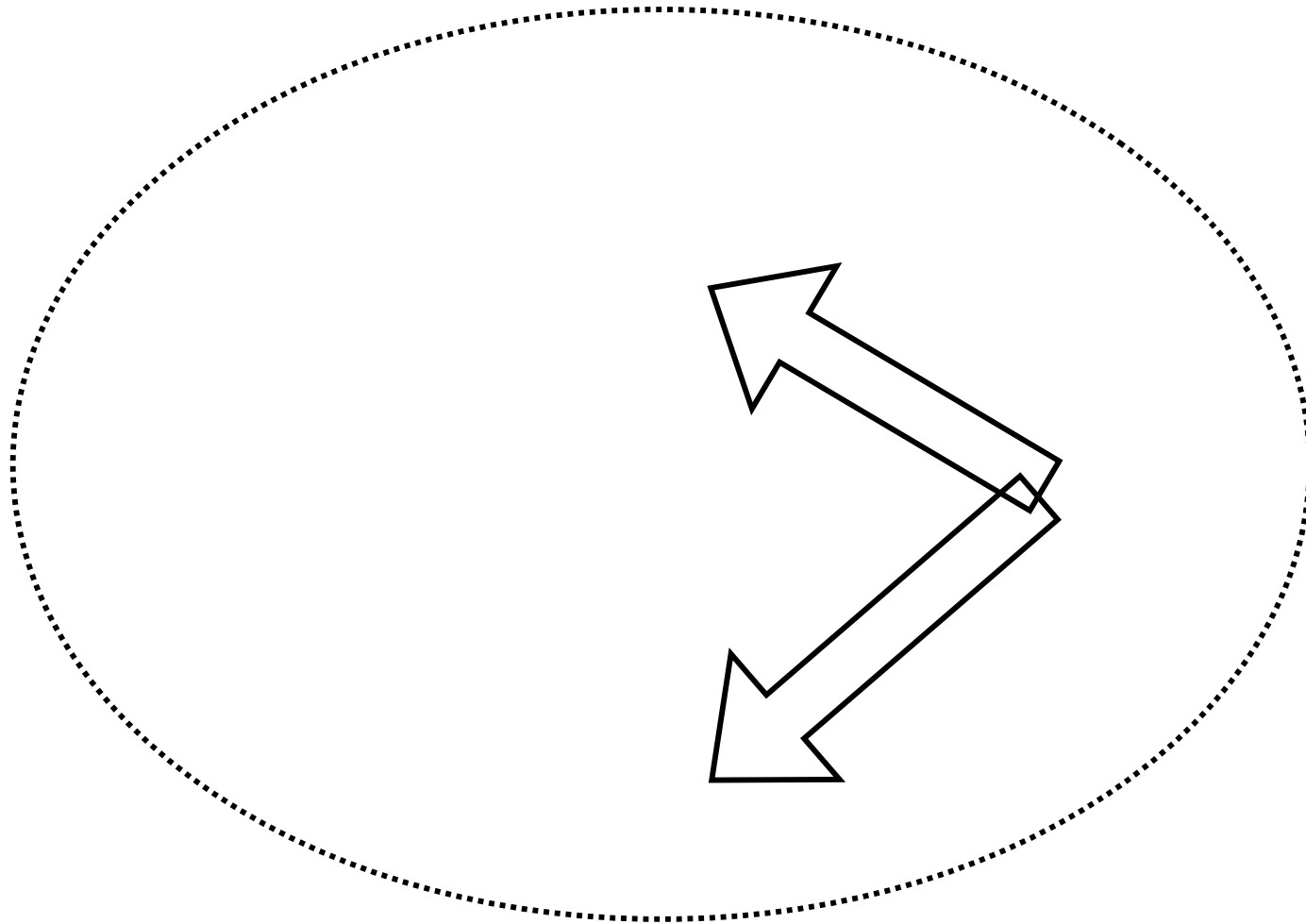
By: CupClub

Location: UK

CupClub is the world's first returnable cup ecosystem which replaces the 100 billion single-use cups and lids used globally every year. CupClub provides a service for drinks, allowing consumers to take away hot and cold beverages from any participating cafe, returning them when finished to the nearest CupClub drop point. Think bike sharing, but for cups.



How can we inspire people to explore the design space more productively?



What should we name our company?

 Inspire Me!

Let's make it playful/fun!

Enter ideas related to this inspiration here

Submit Idea

3 Ideas for this Inspiration!

DataLegos

DataPlayground

dataplay

Names that evoke movement (think of fluids, energy, etc.)



Dynamic Data

What should we name our company?

 Inspire Me!

Names that evoke movement (think of fluids, energy, etc.)

Enter ideas related to this inspiration here

Submit Idea

6 Ideas for this Inspiration!

DataNitro!

Infoflux

Dynamic Data

Names that evoke movement (think of fluids, energy, etc.)

Enter ideas related to this inspiration here

Submit Idea

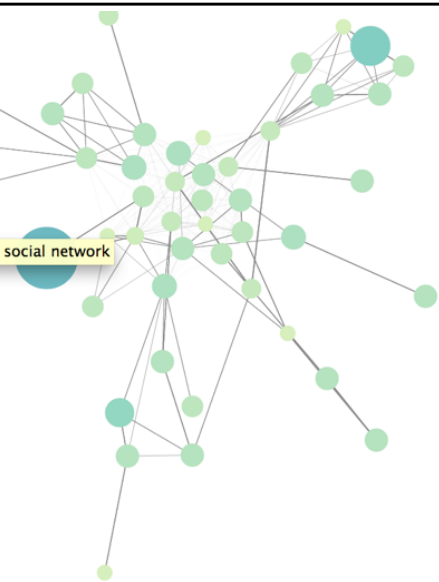
6 Ideas for this Inspiration!

DataNitro!

Infoflux

Dynamic Data





46

ideas

basics blocks books creative
 crossplay dataplay dive energy
 explorable exploratory exploravis
 explore exporetica **factory** flowing

11

ideators

fluid **friendly** friendship frontier
 frontiers fun game gamify garden

insight

insights kinetic kinetify
 knowledge lego legos map mapper
 maps mind move play playgounrd
playground sandcastles
 solutions **visual** vizplay

There are some interesting play-related names -
 maybe I can ask people to come up with
 variations on that?

Hmmm Lego is interesting - something about
 blocks?

INSPIRE THE CROWD!

**Think of fluids/energy/
 movement**

14 ideas

2/6

Mid

**Think of a sense of
 exploration**

3 ideas

2/6

Mid

insight maps

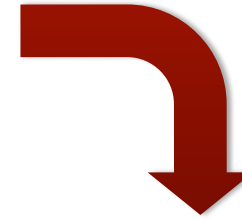
0

data frontiers

1

frontier guides

0



What should we name our company?

Inspire Me!

**Names that evoke
 movement (think of
 fluids, energy, etc.)**

Enter ideas related to this
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Submit Idea

6 Ideas for this Inspiration!

DataNitro!

Infoflux

Dynamic Data

**Names that evoke
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 fluids, energy, etc.)**

Enter ideas related to this
 inspiration here

Submit Idea

6 Ideas for this Inspiration!

DataNitro!

Infoflux

Dynamic Data

Submit Idea

3 Ideas for this Inspiration!

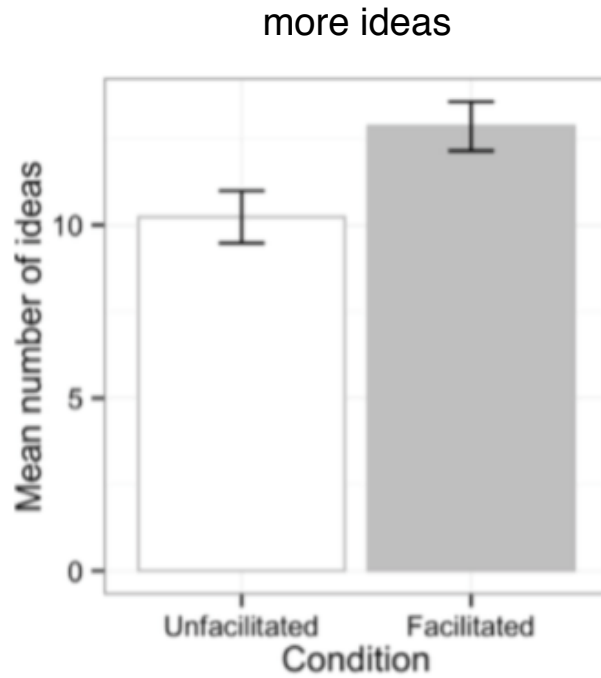
DataLegos

DataPlayground

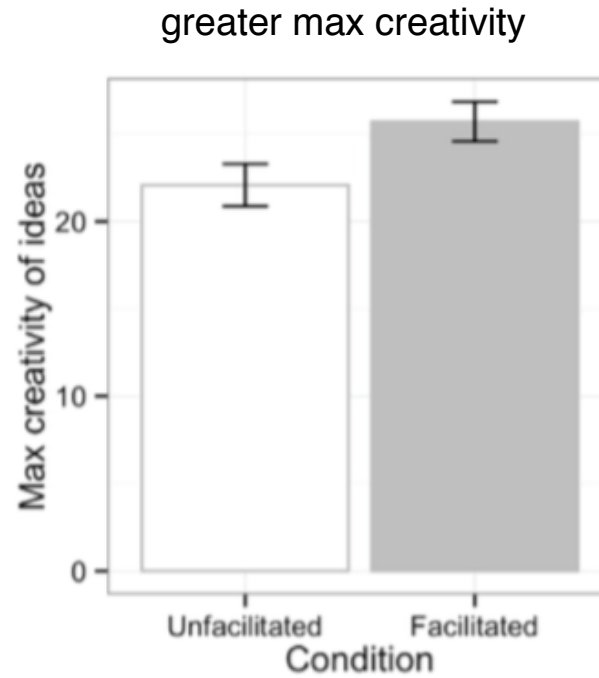
dataplay

Dynamic Data

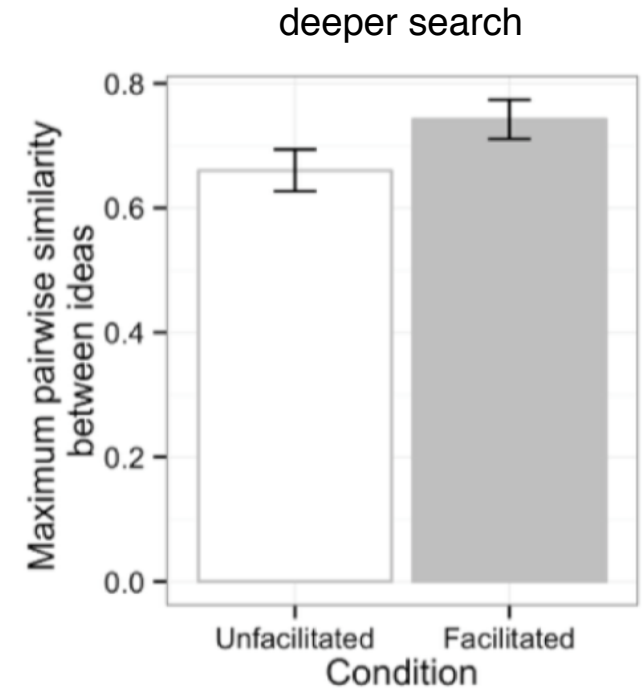
Real-time facilitation improves crowd ideation



$F(1,83) = 6.4, p = .01$



$F(1,83) = 4.8, p = .03$



$F(1,83) = 3.2, p = .08$

Improving Crowd Innovation with Expert Facilitation, Joel Chan, Steven Dang, and Steven P. Dow. In ACM Conference on Computer-Supported Cooperative Work and Social Computing, 2016.

IdeaGens: A Social Ideation System for Guided Crowd Brainstorming, Joel Chan, Steven Dang, Peter Kremer, Lucy Guo, and Steven P. Dow. In extended abstracts of AAAI Conference on Human Computation and Crowdsourcing, 2014.

Experts derive semantic models that inspire

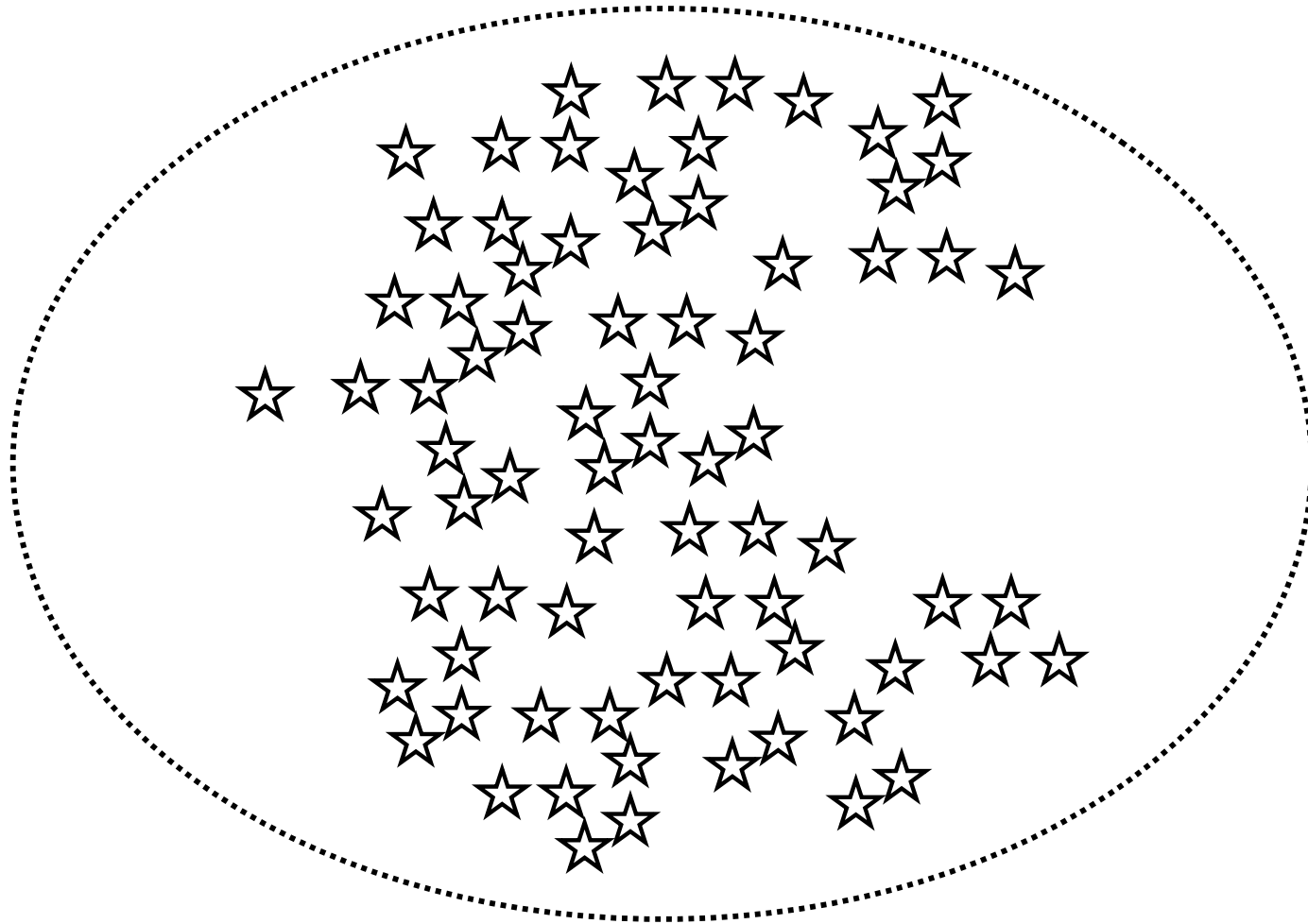
Strategy	Description	Sample Inspiration with Strategy	Yield	Max creativity
Examples	Directly provide an idea	<i>"Ask them to put their contact info in your phone"</i>	+0.2	+1.8
Simulations	Invite ideators to generate ideas from a different perspective (e.g., from a different "persona" or specific situation/setting).	<i>"Imagine if you had a different persona (e.g., a politician collecting signatures). What strategies might be available to you?"</i>	+0.3	+8.2 **
Inquiries	Provoke open-ended reflection	<i>"Where might their name be written?"</i>	+0.2	-2.3

^m $p < .10$ * $p < .05$ ** $p < .01$,

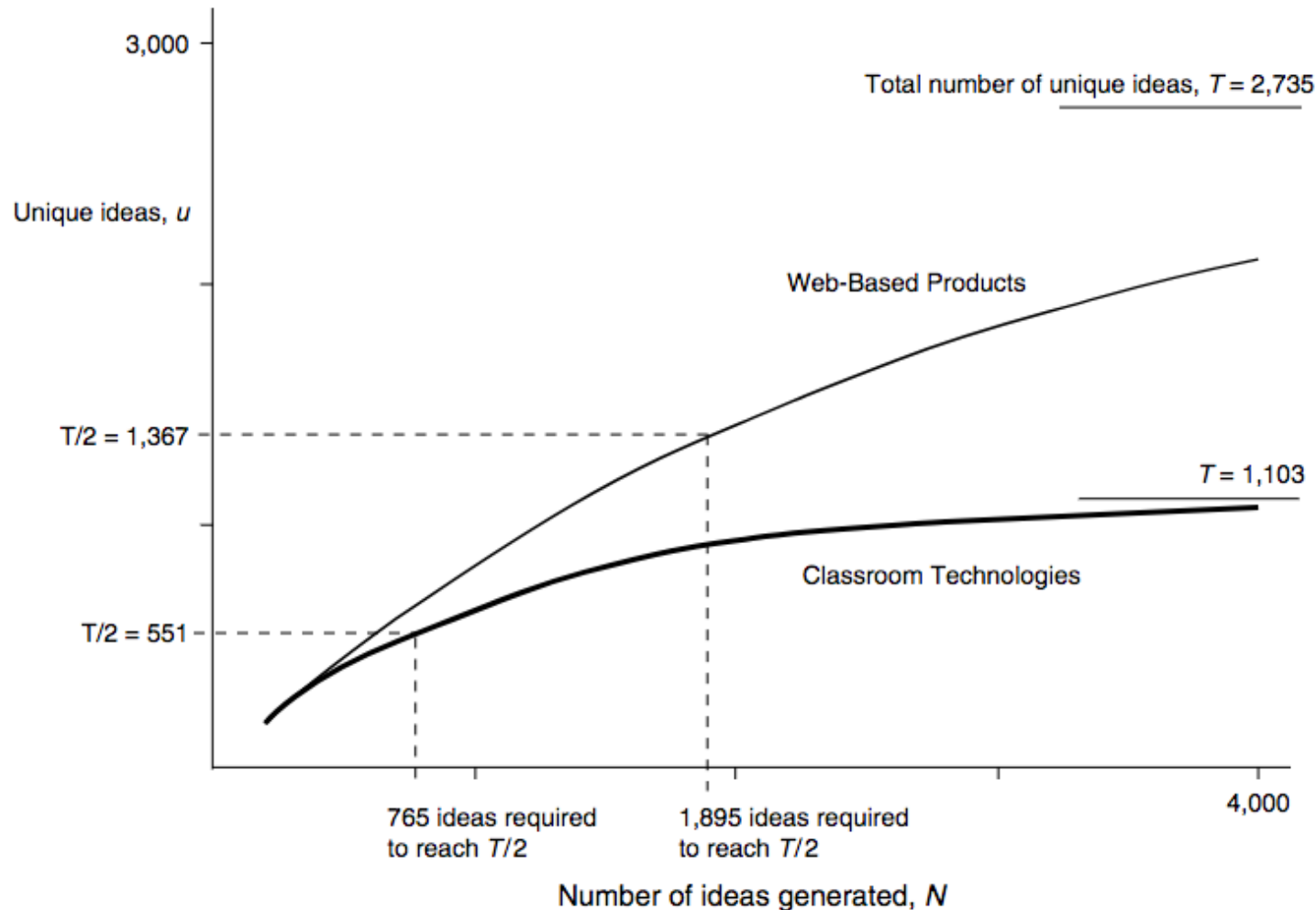
Improving Crowd Innovation with Expert Facilitation, Joel Chan, Steven Dang, and Steven P. Dow. In ACM Conference on Computer-Supported Cooperative Work and Social Computing, 2016.

IdeaGens: A Social Ideation System for Guided Crowd Brainstorming, Joel Chan, Steven Dang, Peter Kremer, Lucy Guo, and Steven P. Dow. In extended abstracts of AAAI Conference on Human Computation and Crowdsourcing, 2014.

(How) can we gain better coverage of very large spaces of ideas?



Effort required to explore an opportunity space



Kornish and Ulrich, "Opportunity Spaces in Innovation: Empirical Analysis of Large Samples of Ideas," *Management Science* (2011): 107-128.

COMMUNICATION

WHY?

IT IS VERY COMMON TO REQUEST CHANGES.

QUESTIONS RUIN THE PROCESS!

REWORK

- Why is it so common to request changes?
- How can we reduce the number of changes?
- What are the reasons for changes?
- How can we communicate better?
- What are the consequences of changes?
- How can we track changes?
- What are the best practices for communication?

IT IS NOT "REJECTION"... IT IS "DO NOT APPROVE"

ASK A QUESTION, FORGET A RESTRICTION.

HAVE A QUESTION... HAS IT ALREADY BEEN ASKED?

MAKE IT EASY TO TRACK CHANGES

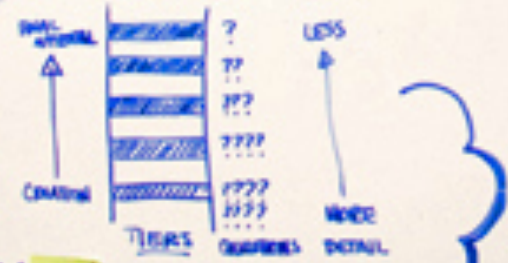
NOTES = QUESTIONS + REMINDERS TO THE NEXT PERSON

ELIMINATE PAPER!

ALLOW ME TO EDIT

DIRECT COMMUNICATION TO 1 or MANY?

I WANT TO SEE EVERYTHING... POINT IT OUT!



QUICK REVIEW

DETAILED REVIEW



LOOK-UP

STATUS

NOTIFICATIONS

WHERE IS THE CAP?

WHO HAS SEEN IT?

INFLUENCE MY TO-DO LIST

I WANT TO APPROVE CAPS STANDING IN LINE AT JEWEL

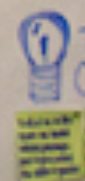
WORK-AROUNDS

WE NEED TO KNOW MORE OR LESS

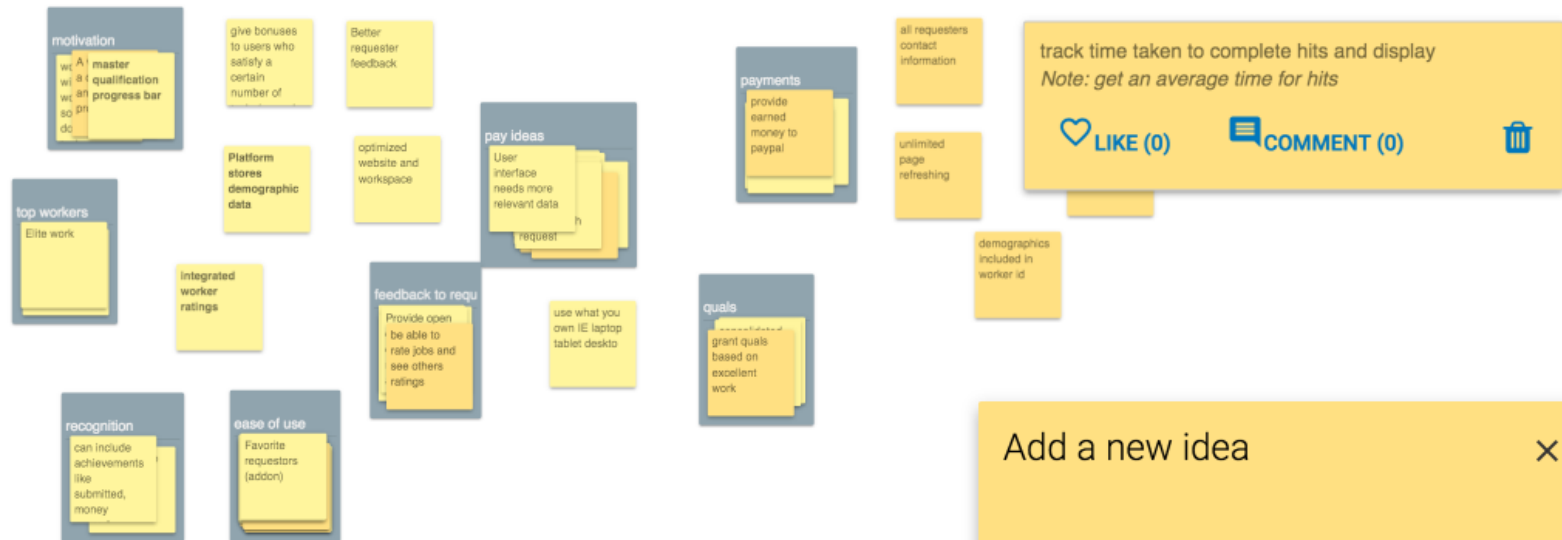
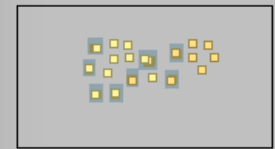
I TRACK MY CAPS IN AN XYS

I VIEW A DRAFT TO SAVE US GRIEF DURING THE PROCESS

I WANT LET YOU MY QUESTIONS + ANSWERS



Minimap



Others' ideas (5)

- user tool
- Work posted date/time
- Appealing UI
- quicker
- better UI for workers

Your ideas (1)

- funds straight to payment funds

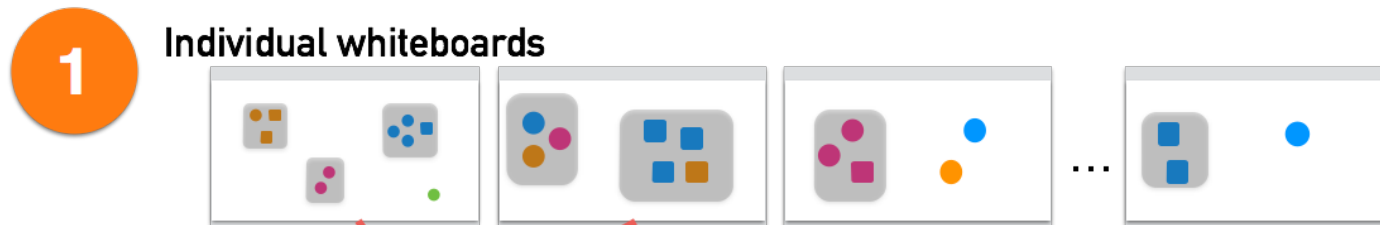
Add a new idea

Type your idea

Explain the concept(s) behind this idea

SUBMIT **SEE IDEAS OF OTHERS**

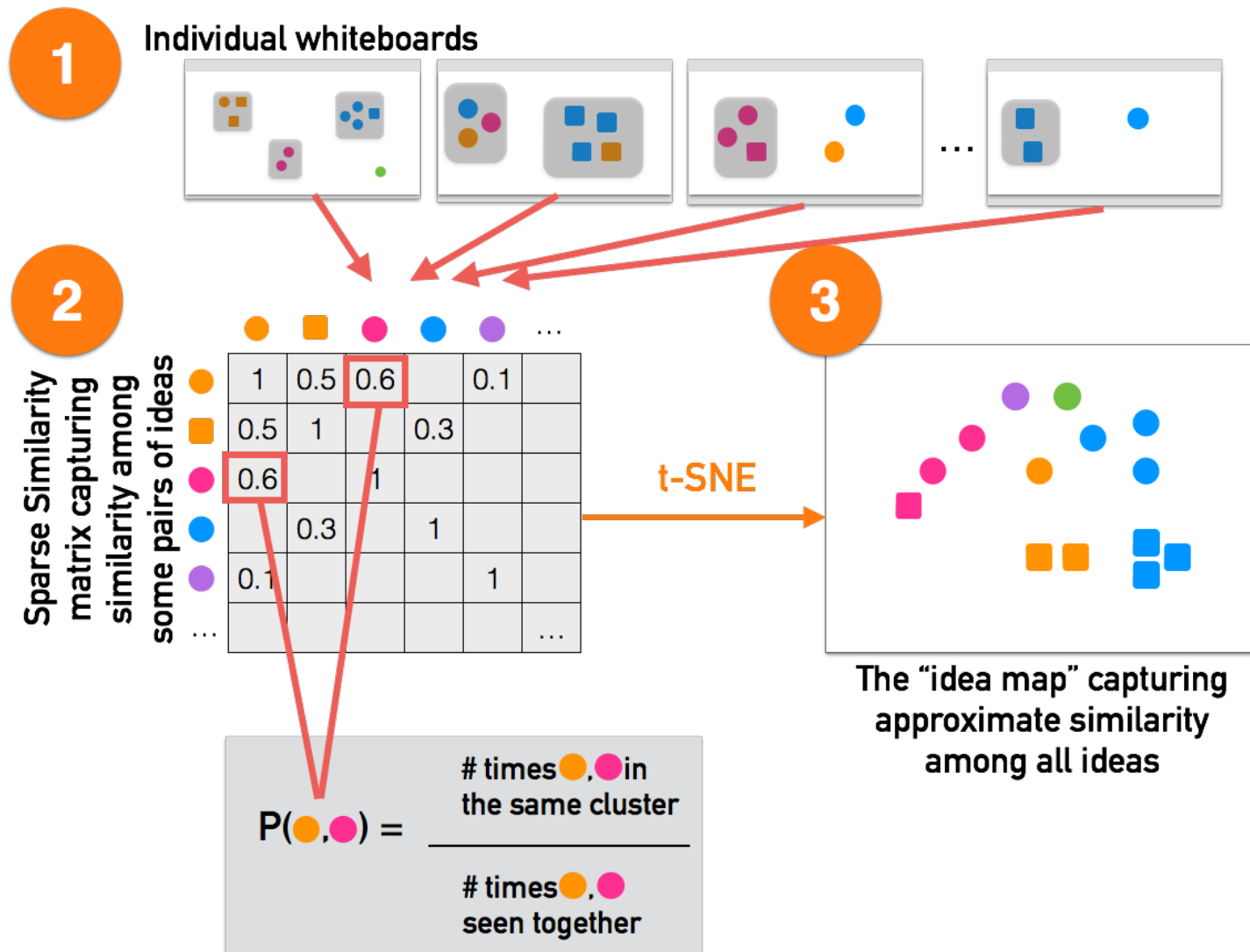
Building an affinity model of concepts



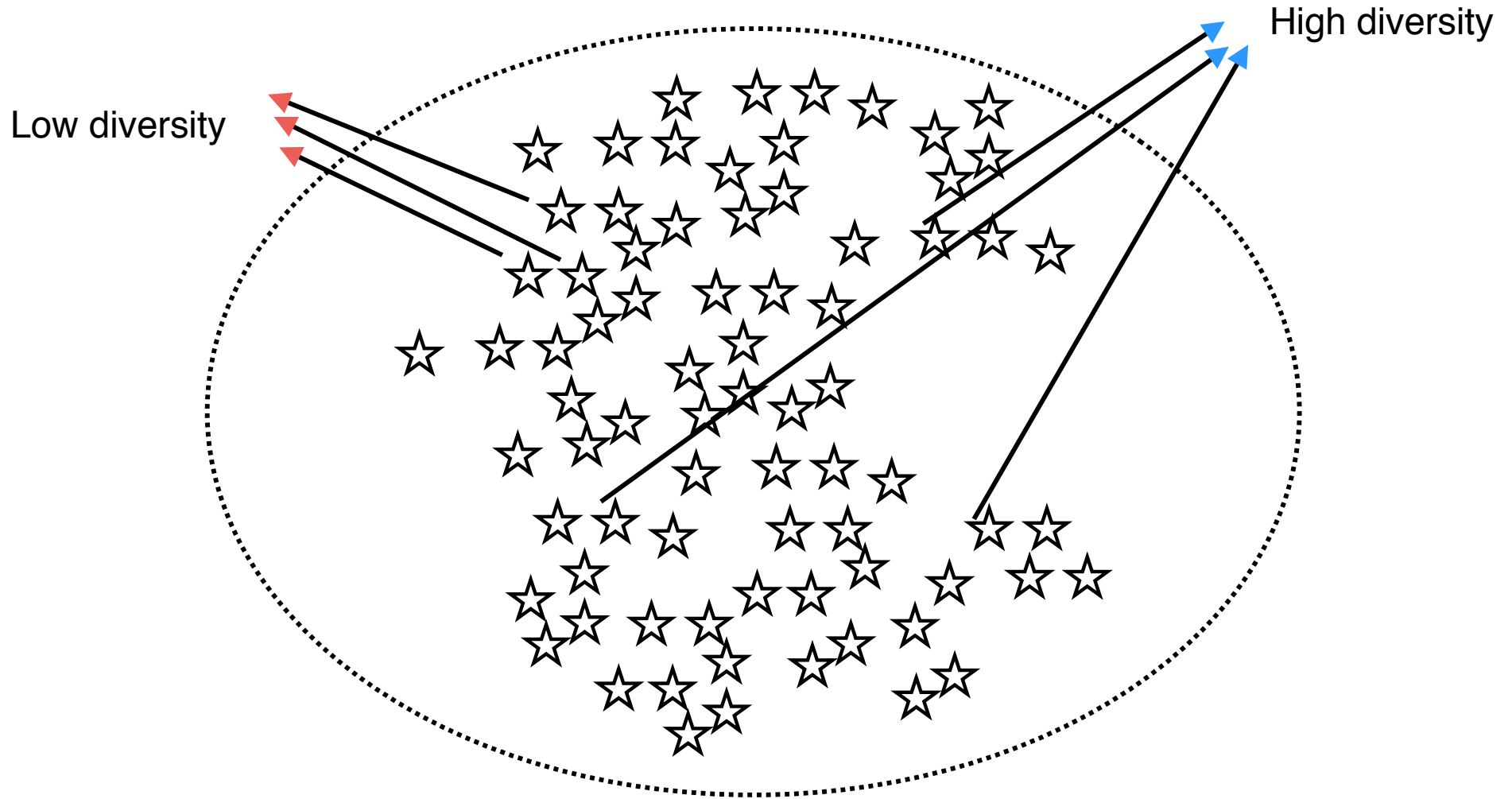
Improving Large-scale Collaborative Ideation with Crowd-powered Real-time Semantic Modeling, Pao Siangliulue, Joel Chan, Steven P. Dow and Krzysztof Z. Gajos, ACM Conference on User Interface Software and Technology, 2016.

Toward Collaborative Ideation at Scale — Leveraging Ideas from Others to Generate More Creative and Diverse Ideas, Pao Siangliulue, Kenneth C. Arnold, Krzysztof Z. Gajos, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

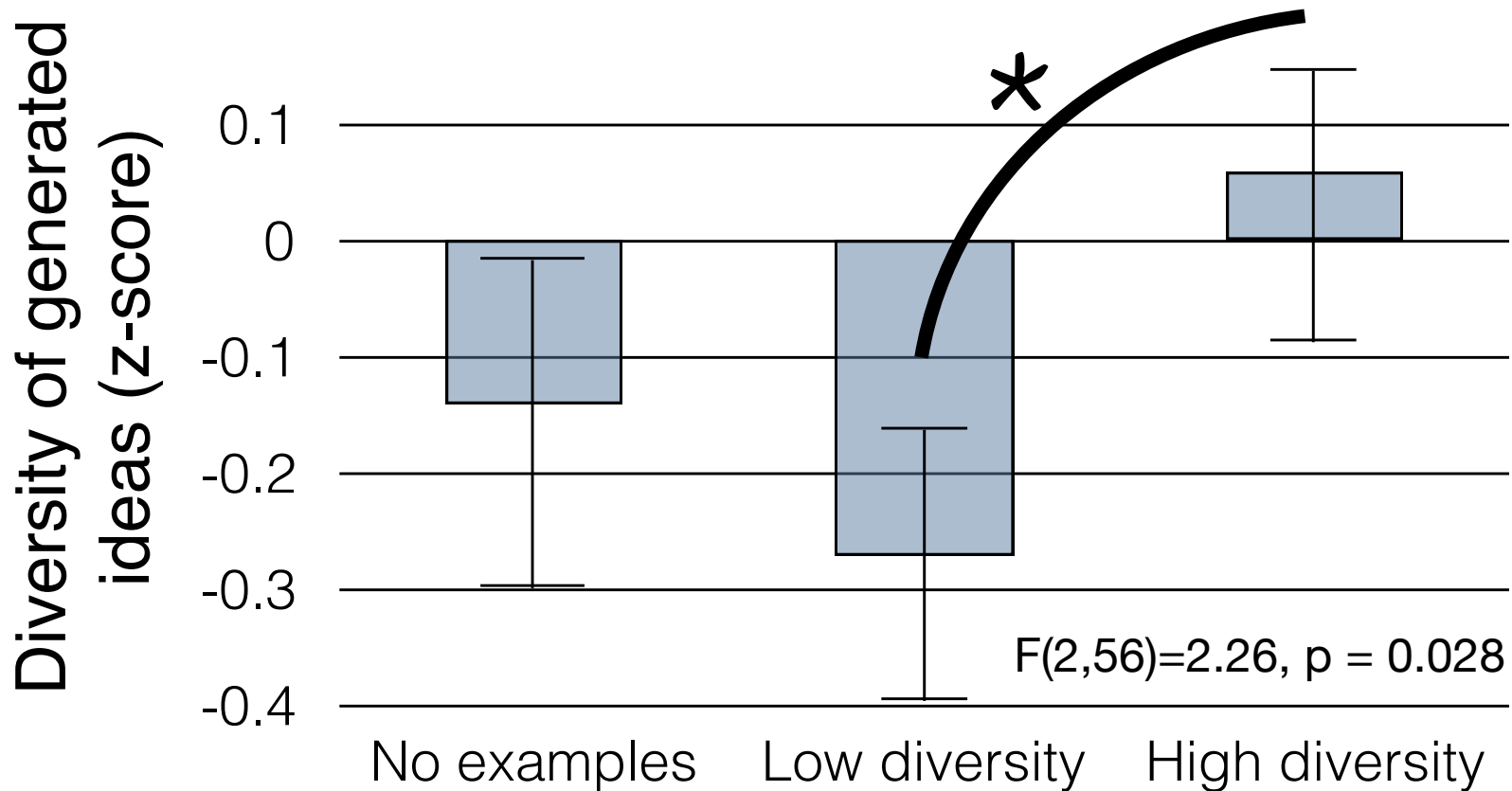
Building an affinity model of concepts



Strategies for sampling concepts from the underlying affinity model



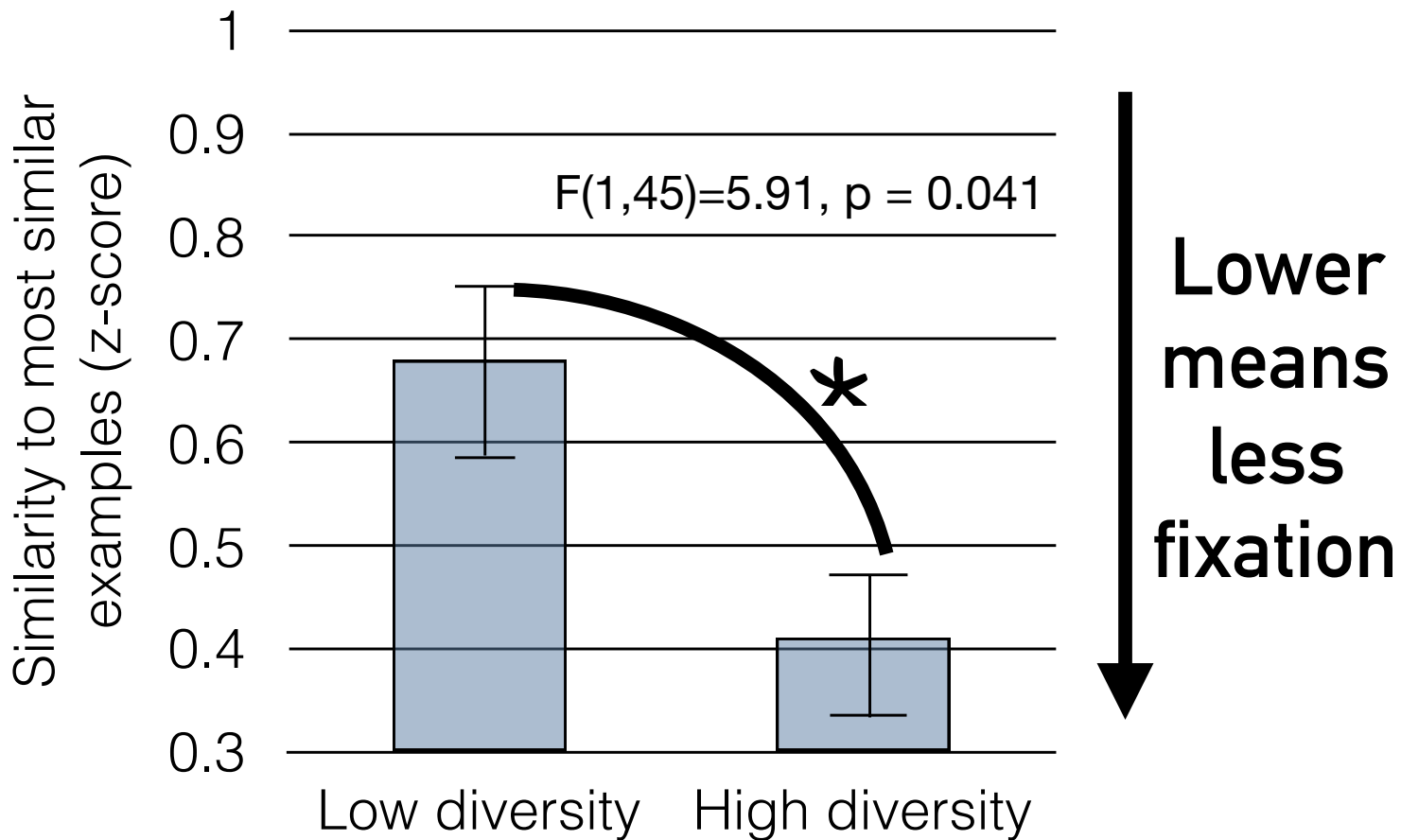
People who saw auto-selected diverse examples generated more diverse ideas



Improving Large-scale Collaborative Ideation with Crowd-powered Real-time Semantic Modeling, Pao Siangliulue, Joel Chan, Steven P. Dow and Krzysztof Z. Gajos, ACM Conference on User Interface Software and Technology, 2016.

Toward Collaborative Ideation at Scale — Leveraging Ideas from Others to Generate More Creative and Diverse Ideas, Pao Siangliulue, Kenneth C. Arnold, Krzysztof Z. Gajos, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

People who saw auto-selected diverse examples fixated less



Improving Large-scale Collaborative Ideation with Crowd-powered Real-time Semantic Modeling, Pao Siangliulue, Joel Chan, Steven P. Dow and Krzysztof Z. Gajos, ACM Conference on User Interface Software and Technology, 2016.

Toward Collaborative Ideation at Scale — Leveraging Ideas from Others to Generate More Creative and Diverse Ideas, Pao Siangliulue, Kenneth C. Arnold, Krzysztof Z. Gajos, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

Brainstorming with crowds

Research papers:

Improving Crowd Innovation with Expert Facilitation, Joel Chan, Steven Dang, and Steven P. Dow. In ACM Conference on Computer Supported Cooperative Work and Social Computing, 2016.

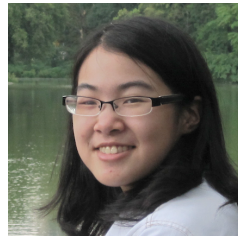
Do The Best Design Ideas (Really) Come From Conceptually Distant Sources Of Inspiration?, Joel Chan, Steven P. Dow, and Christian D. Schunn. Journal of Design Studies, 2014.

Toward Collaborative Ideation at Scale — Leveraging Ideas from Others to Generate More Creative and Diverse Ideas, Pao Siangliulue, Kenneth C. Arnold, Krzysztof Z. Gajos, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015. (Nominated for Best Contribution to Creative Communication)

Conceptual Distance Matters When Building on Others' Ideas in Crowd- Collaborative Innovation Platforms, Joel Chan, Steven P. Dow, and Christian Schunn. In extended abstracts of ACM Conference on Computer Supported Cooperative Work, 2014.

Crowd Synthesis: Extracting Categories and Clusters from Complex Data, Paul André, Niki Kittur, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work (CSCW'14), 2014.

Collaborators:

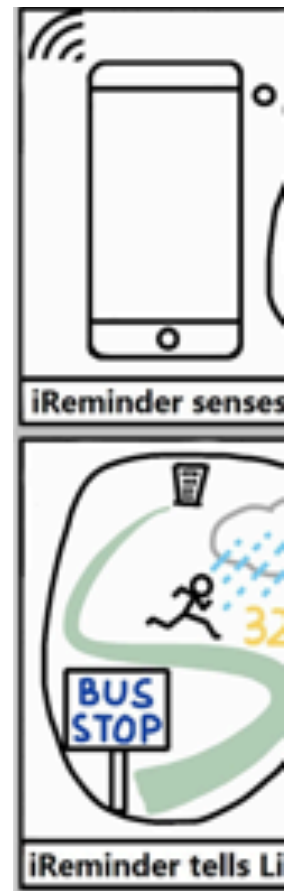




Peer feedback during class: scale but poor diversity



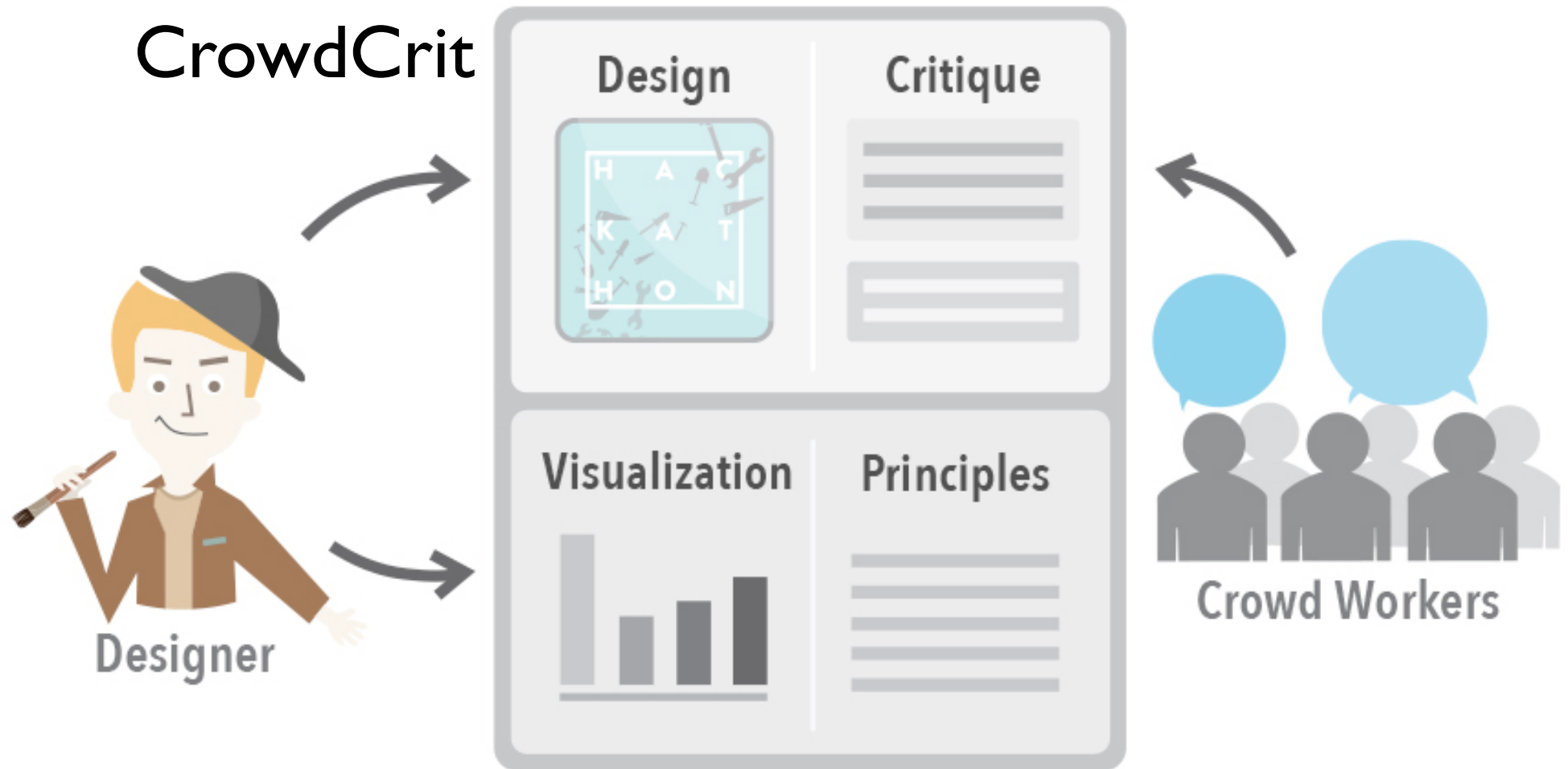
Obtaining feedback from diverse stakeholders



A Pilot Study of Using Crowds in the Classroom, Steven P. Dow, Elizabeth Gerber, and Audris Wong. ACM Conference on Human Factors in Computing Systems, 2013.

Exiting the Design Studio: Leveraging Online Participants for Early-Stage Design Feedback, Xiaojuan Ma, Yu Li, Jodi Forlizzi, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

Scaffolding feedback exchange



Structuring, Aggregating, and Evaluating Crowdsourced Design Critique, Kurt Luther, Jari-lee Tolentino, Wei Wu, Amy Pavel, Brian P. Bailey, Maneesh Agrawala, Björn Hartmann, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

CrowdCrit: Principled Rubrics

Allegheny County Music Festival (P1): This is a poster for an upcoming music festival in Allegheny County, Pennsylvania. The goal of the poster is to get people interested in going to the festival.



Add a Critique

The design should match the importance of content to its visual prominence - make the most important information visually dominant. Use clear contrast to distinguish different levels of information.

POSITIVES

- Good visual emphasis
- Good visual flow
- Strong focal point
- Good visual contrast

CRITIQUES

- Elements lack contrast
- Design lacks contrast

- Layout
- Consistency
- Balance
- Appropriateness
- Emphasis
- Readability
- Simplicity
- Other

Your Comments

You have not made any comments yet. Your critiques will show up here after you add them.

Structuring, Aggregating, and Evaluating Crowdsourced Design Critique, Kurt Luther, Jari-lee Tolentino, Wei Wu, Amy Pavel, Brian P. Bailey, Maneesh Agrawala, Björn Hartmann, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

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- Appropriateness
- Emphasis

POSITIVES

- Good visual emphasis
- Good visual flow
- Strong focal point
- Good visual contrast

CRITIQUES

- Elements lack contrast
- Design lacks contrast

The design should enable a progressive discovery of meaning. There should be layers of importance where less important information receives less visual prominence.

Your Comments

You have not made any comments yet. Your critiques will show up here after you add them.

Structuring, Aggregating, and Evaluating Crowdsourced Design Critique, Kurt Luther, Jari-lee Tolentino, Wei Wu, Amy Pavel, Brian P. Bailey, Maneesh Agrawala, Björn Hartmann, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

CrowdCrit: Annotations

Allegheny County Music Festival (P1): This is a poster for an upcoming music festival in Allegheny County, Pennsylvania. The goal of the poster is to get people interested in going to the festival.



Add a Critique

Strong focal point

Critique Details

Annotate the parts of the slide related to the critique you selected:

Marker Box Polygon Whole

Describe the issue using the textbox below:

Good emphasis on the band name

Good visual contrast

CRITIQUES

Layout

Consistency

Balance

Appropriateness

Emphasis

Readability

Simplicity

Other

Your Comments

You have not made any comments yet. Your critiques will show up here after you add them.

Structuring, Aggregating, and Evaluating Crowdsourced Design Critique, Kurt Luther, Jari-lee Tolentino, Wei Wu, Amy Pavel, Brian P. Bailey, Maneesh Agrawala, Björn Hartmann, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

CrowdCrit: Visual overview

Feedback On Your Design

Overview

Appropriateness

Balance

Consistency

Emphasis

Layout

Readability

Simplicity

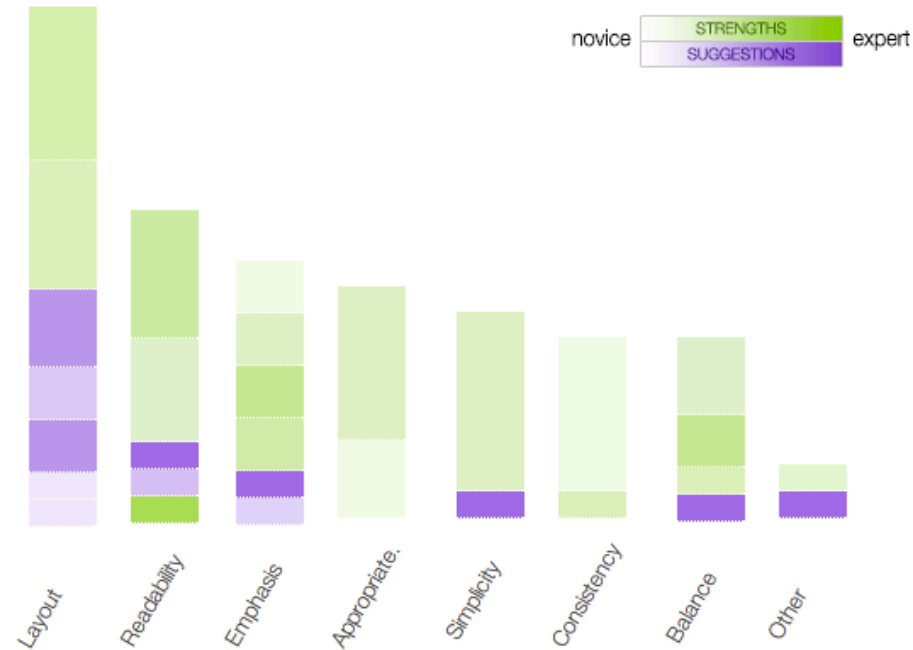
Other

TITLE **Allegheny County Music Festival (P1)**

CONTEXT This is a poster for an upcoming music festival in Allegheny County, Pennsylvania. The goal of the poster is to get people interested in going to the festival.



Feedback Distribution (75)



Top Feedback

8%	Simple and clean (Simplicity)	strength
6%	Well organized (Layout)	strength
6%	Consistent design language (Consistency)	strength

CrowdCrit: Detailed feedback

Feedback On Your Design

Overview Appropriateness Balance Consistency Emphasis **Layout** Readability Simplicity Other

TITLE **Allegheny County Music Festival (P1)**

CONTEXT This is a poster for an upcoming music festival in Allegheny County, Pennsylvania. The goal of the poster is to get people interested in going to the festival.



Layout (20)

[Collapse/Expand All](#)

Well organized (6)

"Overall its a good poster. It the right style and design for the event its promoting."

competent

(no details)

competent

"In General, the message is clear."

expert

"Good use of space."

novice

(no details)

novice

"Well organized; not a lot of distractions. Straight to the point! Easy to read. Design is great!"

novice

Good alignment (5)

"Text has good margins"

competent

"I really like the use of space here. There is not too much blank space. "

novice

"No issues with alignment. Very nice. "

competent

"Everything is aligned and in great order. It's easy on the eyes and attractive."

novice

"Very readable - great spacing, contrast, font and size."

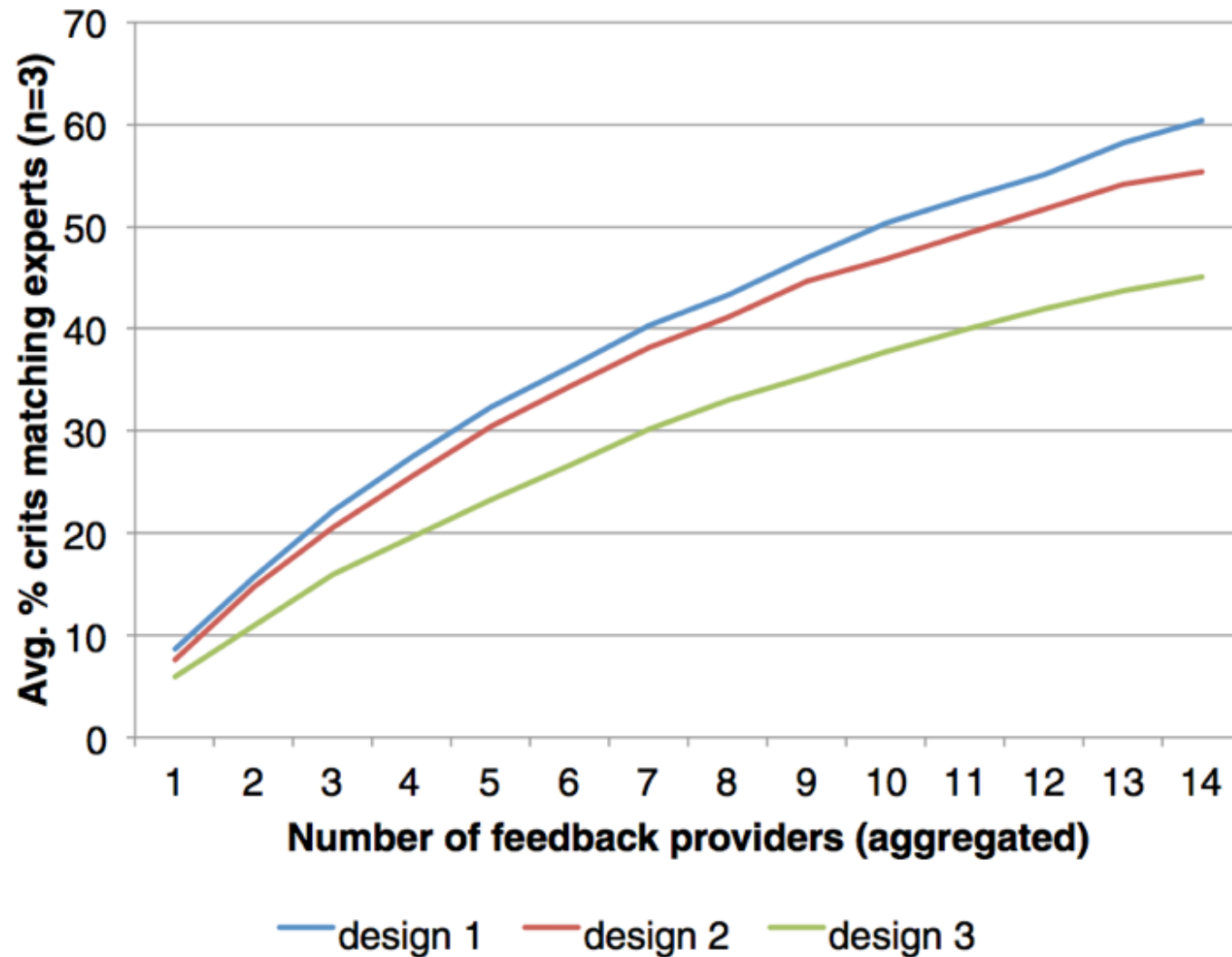
competent

Poor placement (3)

"I think this should be at the top with the event title, so the audience immediately knows the date of the event."

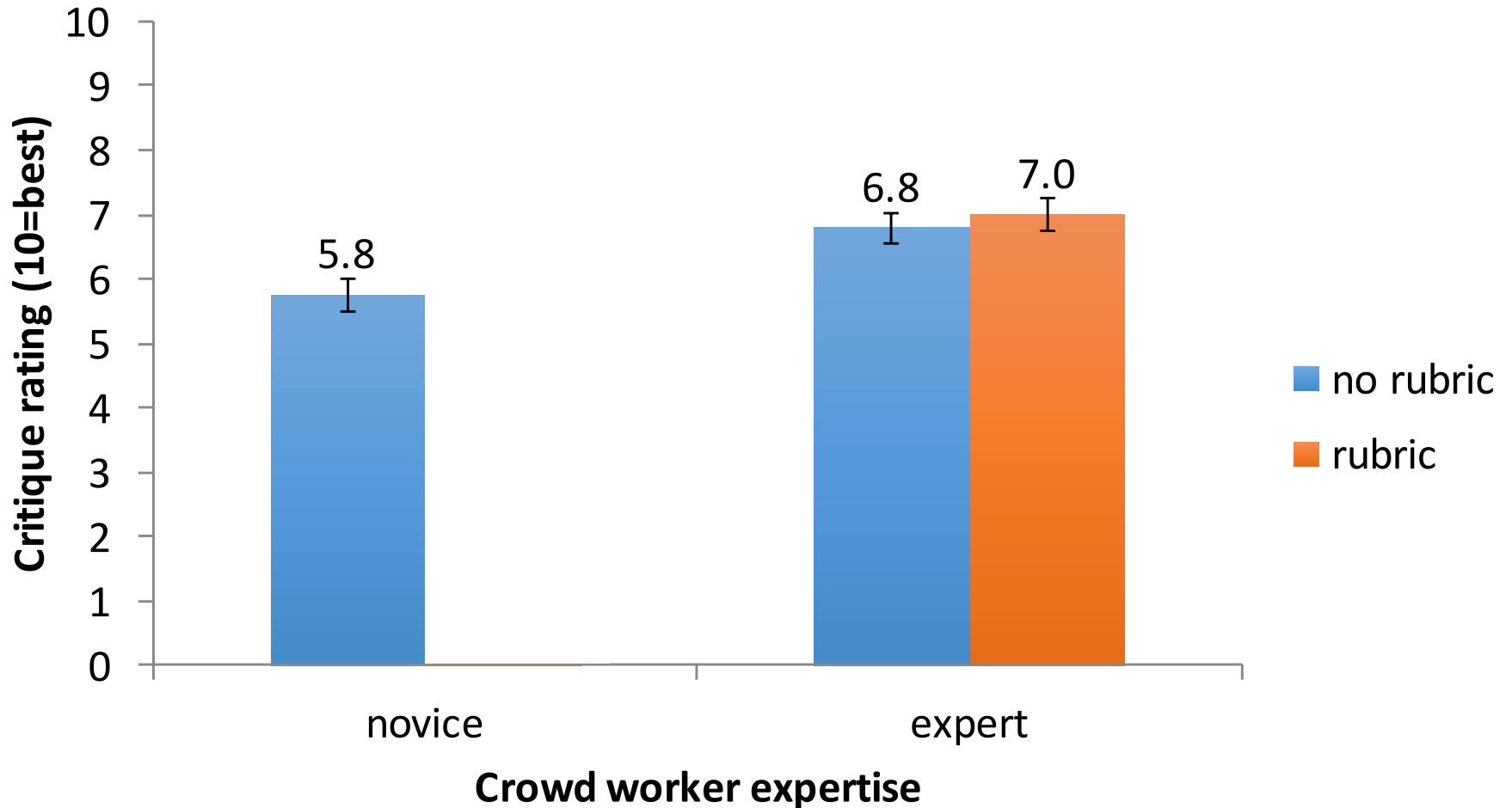
competent

More feedback providers, more issues identified



Structuring, Aggregating, and Evaluating Crowdsourced Design Critique, Kurt Luther, Jari-lee Tolentino, Wei Wu, Amy Pavel, Brian P. Bailey, Maneesh Agrawala, Björn Hartmann, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

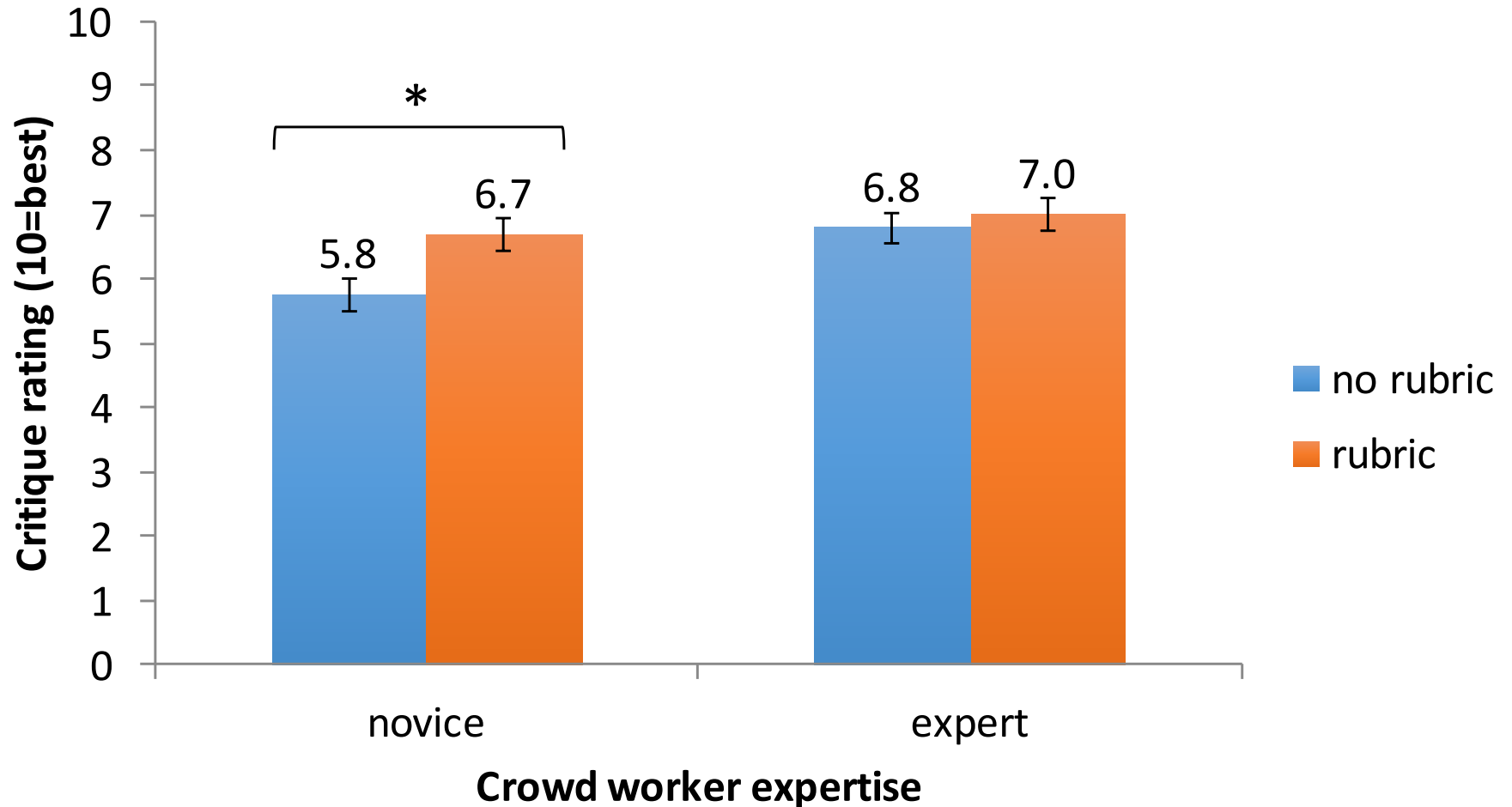
Without rubrics, novices do worse than experts



No rubric novice (M=5.76, SD=1.28) < No rubric expert (M=6.79, SD=0.41), $p < 0.05$
No rubric novice (M=5.76, SD=1.28) < Rubric expert (M=7.00, SD=0.79), $p < 0.05$

Almost an Expert: The Effects of Rubrics and Expertise on Perceived Value of Crowdsourced Design Critiques, Alvin Yuan, Kurt Luther, Sophie Vennix, Markus Krause, Steven P. Dow, and Björn Hartmann. In ACM Computer Supported Cooperative Work and Social Computing (CSCW'16), 2016.

With rubrics, novices critique ratings improve



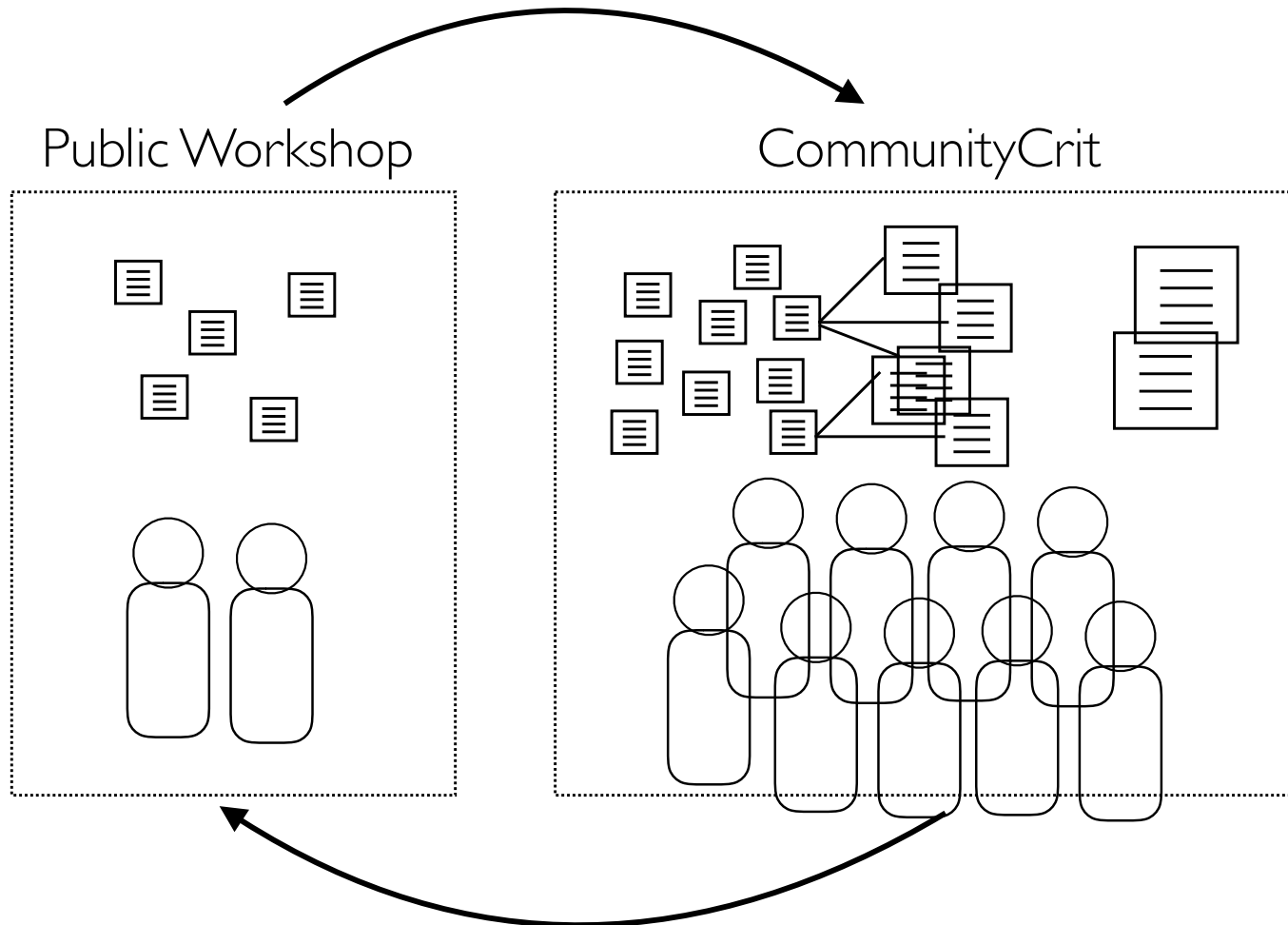
Rubric novice (M=6.69, SD=0.65) > No rubric novice (M=5.76, SD=1.28), $p < 0.05$

Almost an Expert: The Effects of Rubrics and Expertise on Perceived Value of Crowdsourced Design Critiques, Alvin Yuan, Kurt Luther, Sophie Vennix, Markus Krause, Steven P. Dow, and Björn Hartmann. In ACM Computer Supported Cooperative Work and Social Computing (CSCW'16), 2016.



Steven Dow
Advancing Collective Innovation

CommunityCrit supplements public workshops



CommunityCrit allows **the public** to participate in the urban design process.

By offering a quick and easy way to voice opinions, CommunityCrit empowers anyone to help shape the future of their community.

Currently, we are collecting feedback on an effort to expand the 14th Street Promenade in East Village. The intersection of 14th Street, National Avenue, and Commercial Street—referred to as "El Nudillo," or "the knuckle"—is envisioned as a pedestrian destination, a place of social gathering, and a celebration of East Village and its surrounding neighborhoods.

What do you think El Nudillo should be? Please click below to contribute your voice!

[GET STARTED](#)



How do surrounding community members think about improving this intersection?

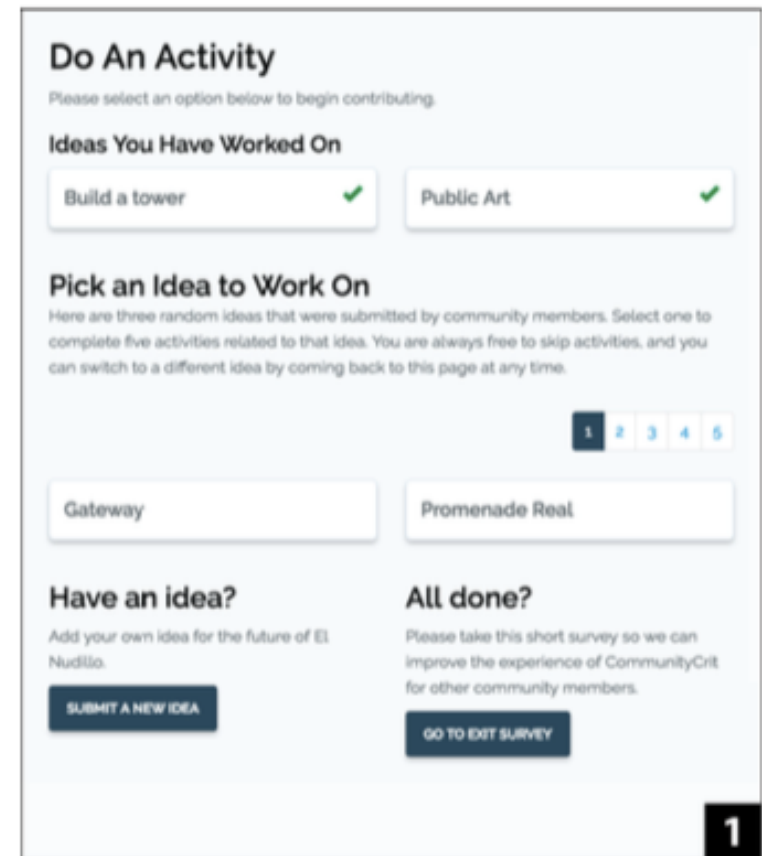
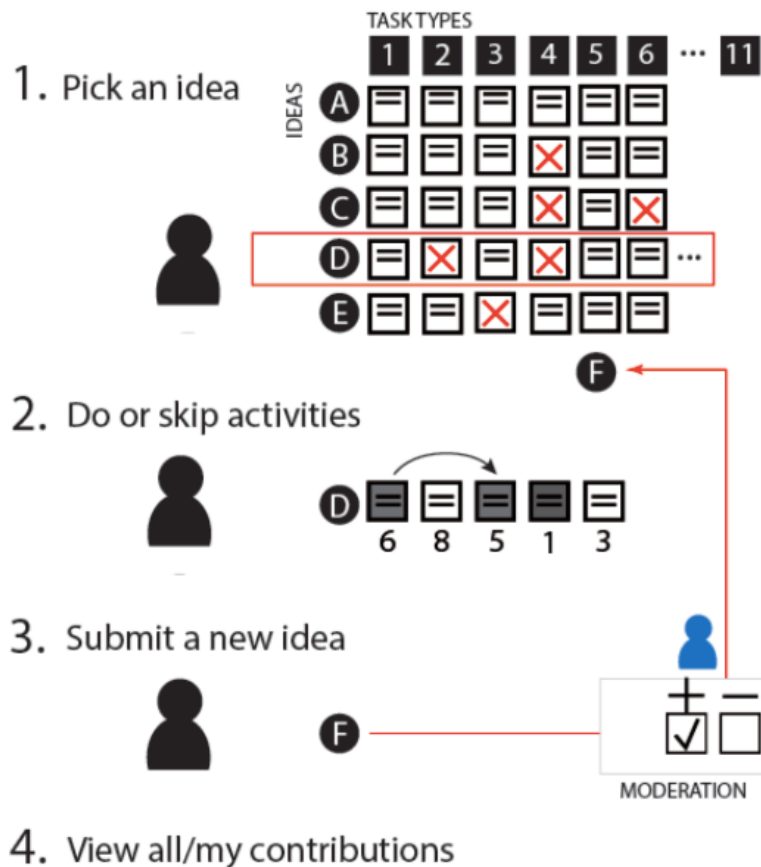
Background Info on El Nudillo

The 14th Street Promenade, which was approved by the city in 2016, will be a pedestrian-friendly "green street" extending from City College in the north to the intersection of 14th Street and National Avenue in the south. It will feature widened sidewalks, outdoor furniture, and art, in order to promote social gathering and a unique neighborhood feel. The overarching goal for the 14th Street Promenade is to help create a more sustainable, walkable downtown.

We are now engaging the public and local experts to develop the intersection of 14th Street, National Avenue, and Commercial Street, which marks the end of the 14th Street Promenade. This intersection—known as **El Nudillo**, or "the knuckle"—is envisioned as a pedestrian destination, a place of social gathering, and a celebration of East Village and its surrounding neighborhoods.

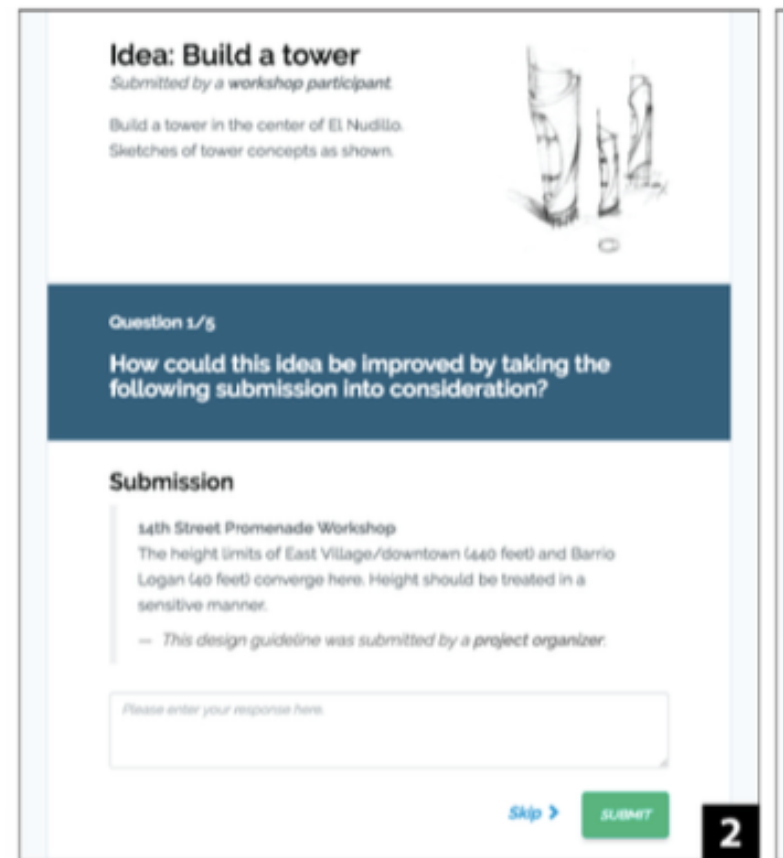
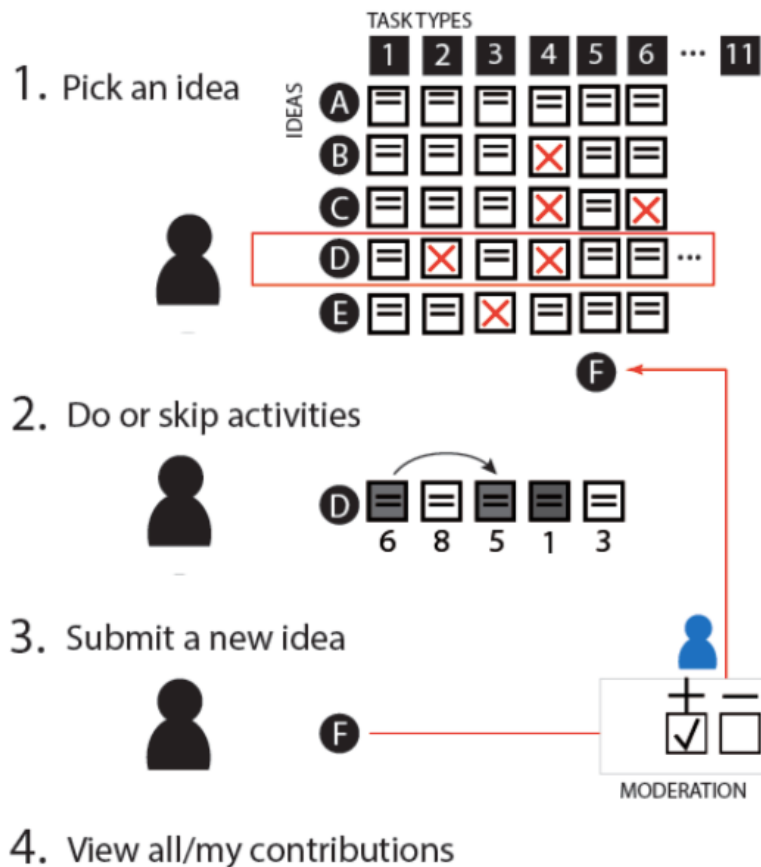


Participants perform micro-tasks around urban design concepts



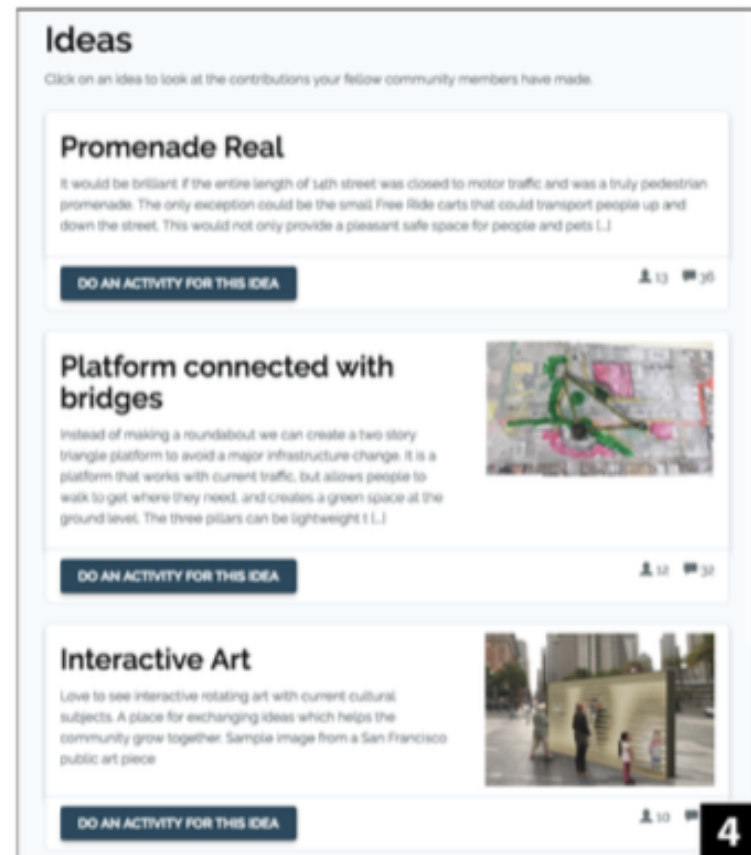
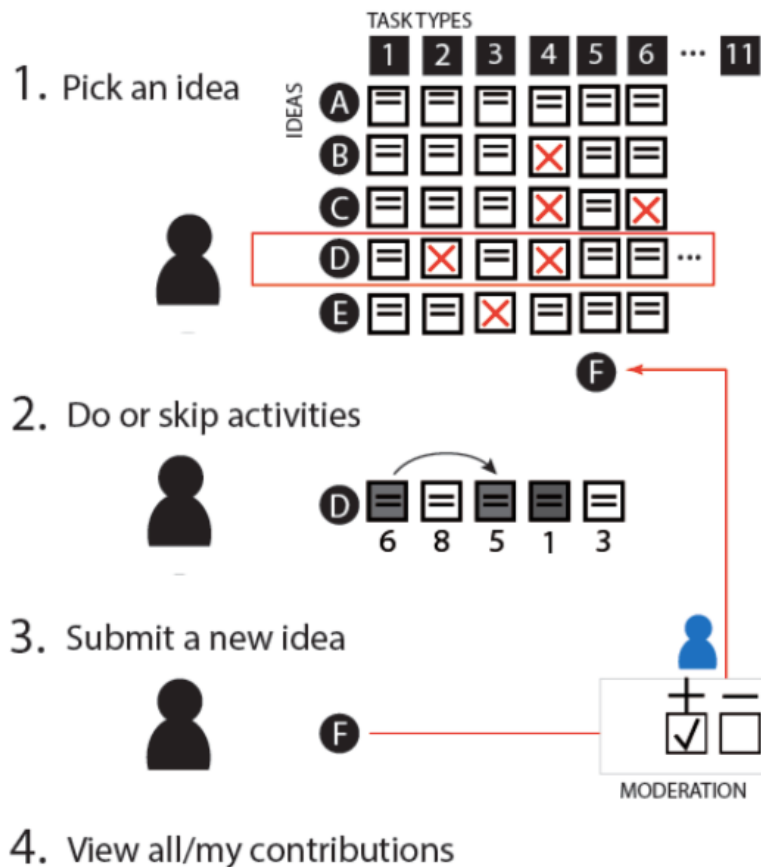
CommunityCrit: Inviting the Public to Improve and Evaluate Urban Design Ideas through Micro-Activities, Narges Mahyar, Michael R. James, Michelle M. Ng, Reginald A. Wu, Steven P. Dow. In Conference on Human Factors in Computing Systems (CHI'18), 2018.

Participants perform micro-tasks around urban design concepts



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Participants perform micro-tasks around urban design concepts



CommunityCrit: Inviting the Public to Improve and Evaluate Urban Design Ideas through Micro-Activities, Narges Mahyar, Michael R. James, Michelle M. Ng, Reginald A. Wu, Steven P. Dow. In Conference on Human Factors in Computing Systems (CHI'18), 2018.

Participants liked that CommunityCrit allowed for small bursts of input

“I don’t have time to go to workshops so it provides opportunity to give feedback”. (P6)

I liked only having to answer 5 questions. I have conducted lengthy surveys myself and thought them to be excessive to the point of endangering the quality of data collection (respondents get bored, distracted, only want the "reward" etc.) (P2)

CommunityCrit: Inviting the Public to Improve and Evaluate Urban Design Ideas through Micro-Activities, Narges Mahyar, Michael R. James, Michelle M. Ng, Reginald A. Wu, Steven P. Dow. In Conference on Human Factors in Computing Systems (CHI'18), 2018.

Urban planners see value in public outreach

“Provides more tools for community outreach and for people to participate, and will give us a chance to present ideas that came out of CommunityCrit back to the public during the next workshop and facilitating a discussion around them.” (E2)

CommunityCrit: Inviting the Public to Improve and Evaluate Urban Design Ideas through Micro-Activities, Narges Mahyar, Michael R. James, Michelle M. Ng, Reginald A. Wu, Steven P. Dow. In Conference on Human Factors in Computing Systems (CHI'18), 2018.

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However...

“it gives a voice to people who are too lazy to get off the couch and come to the workshop” (E4)

CommunityCrit: Inviting the Public to Improve and Evaluate Urban Design Ideas through Micro-Activities, Narges Mahyar, Michael R. James, Michelle M. Ng, Reginald A. Wu, Steven P. Dow. In Conference on Human Factors in Computing Systems (CHI'18), 2018.

Enabling feedback from diverse stakeholders

Research papers:

Structuring, Aggregating, and Evaluating Crowdsourced Design Critique, Kurt Luther, Jari-lee Tolentino, Wei Wu, Amy Pavel, Brian P. Bailey, Maneesh Agrawala, Björn Hartmann, and Steven P. Dow. ACM CSCW, 2015.

Exiting the Design Studio: Leveraging Online Participants for Early-Stage Design Feedback, Xiaojuan Ma, Yu Li, Jodi Forlizzi, and Steven P. Dow. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

A Classroom Study of Using Crowd Feedback in the Iterative Design Process, Anbang Xu, Huaming Rao, Steven P. Dow, and Brian P. Bailey. ACM Conference on Computer Supported Cooperative Work and Social Computing, 2015.

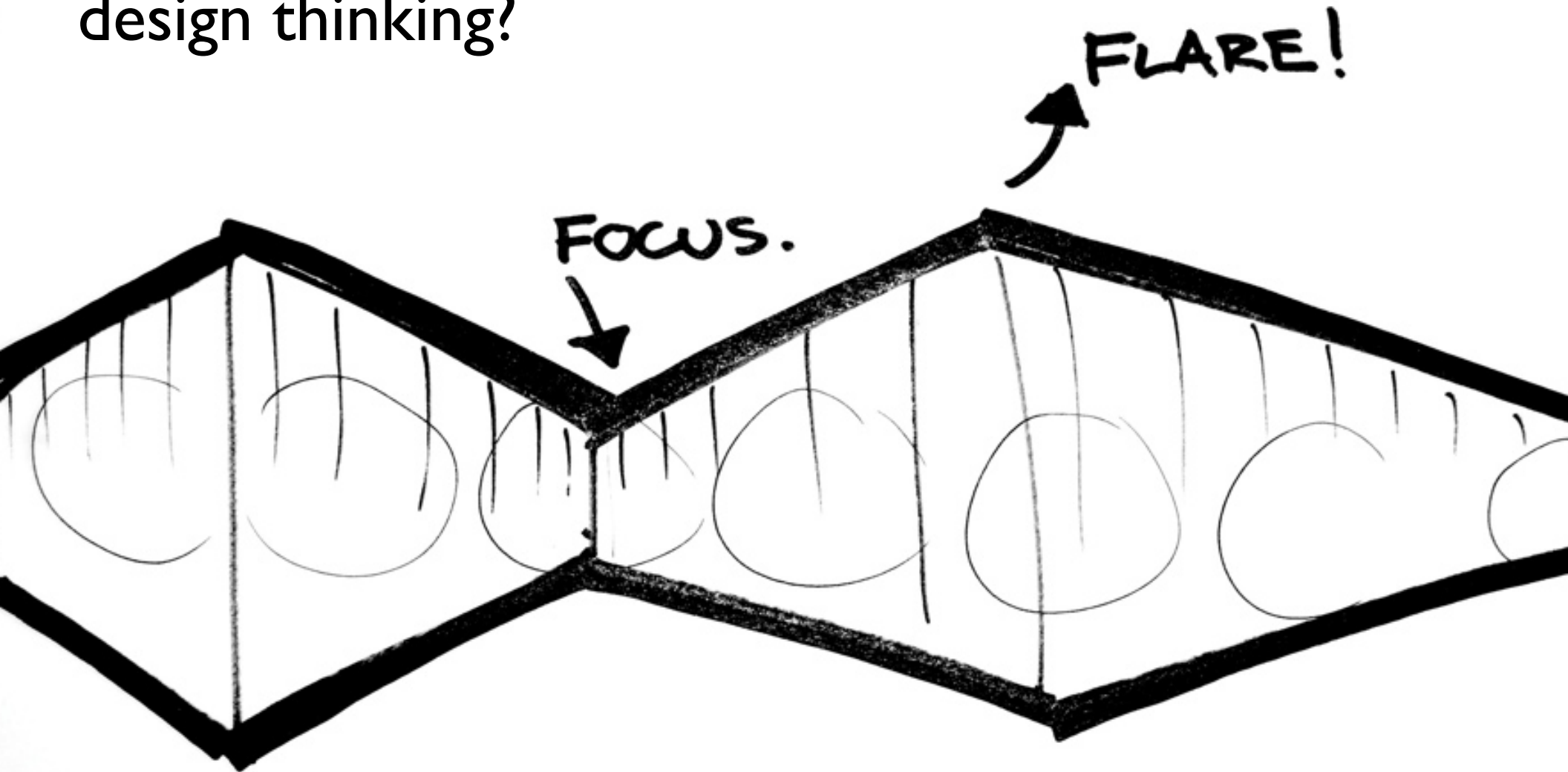
Crowd-Based Design Activities: Helping Students Connect with Users Online, Julie Hui, Elizabeth M. Gerber, and Steven P. Dow. In Conference on Designing Interactive Systems (DIS'14), 2014.

Almost an Expert: The Effects of Rubrics and Expertise on Perceived Value of Crowdsourced Design Critiques, Alvin Yuan, Kurt Luther, Sophie Vennix, Markus Krause, Steven P. Dow, and Björn Hartmann. In ACM CSCW 2016.

CommunityCrit: Inviting the Public to Improve and Evaluate Urban Design Ideas through Micro-Activities, Narges Mahyar, Michael R. James, Michelle M. Ng, Reginald A. Wu, Steven P. Dow. In Conference on Human Factors in Computing Systems, 2018.



How can we engage many stakeholders in design thinking?



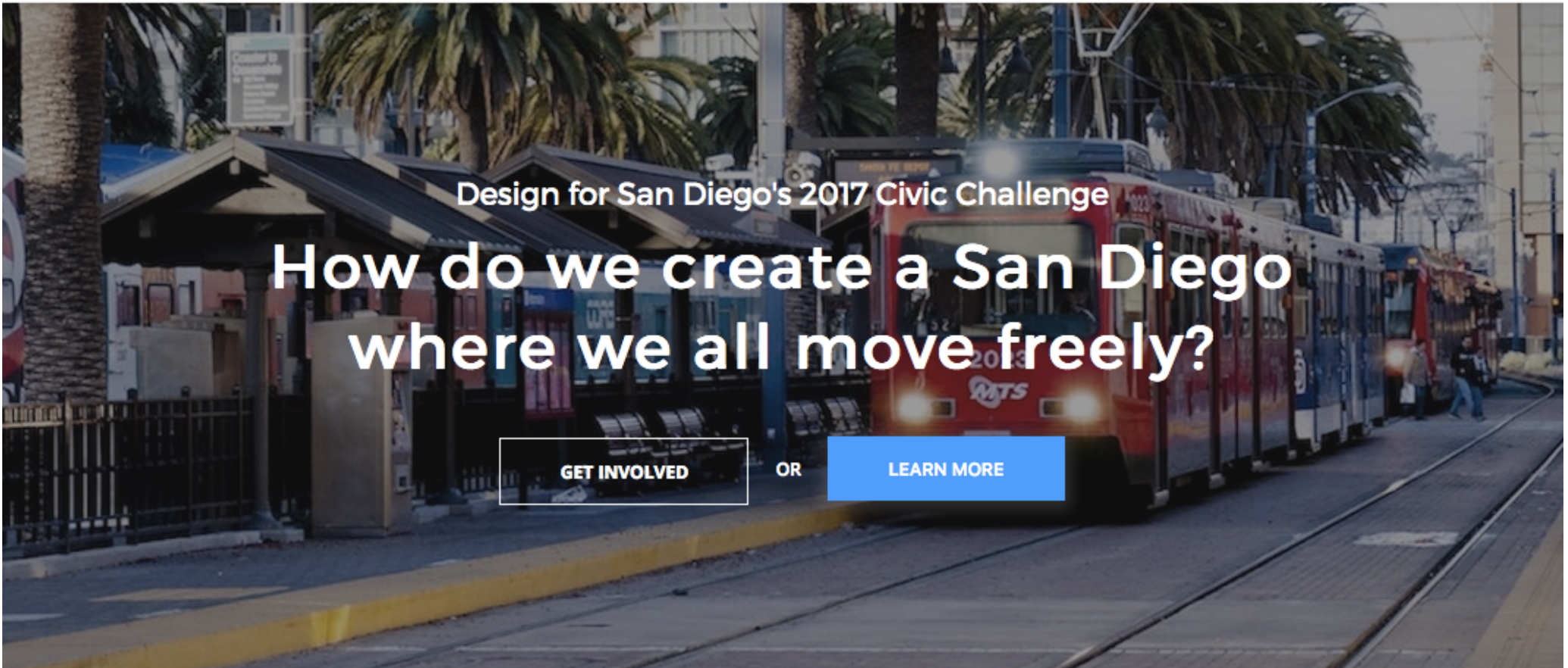
Buxton, 2007
Laseau, 1974

Supporting Collective Innovation

How can we harness collective intelligence, effort, and creativity to innovate on complex problems?

Supporting Collective Innovation

1. Discovering constraints and preferences at scale
2. Obtaining feedback from many diverse stakeholders
3. Exploring many solution paths in parallel
4. Gathering and synthesizing complex information
5. Making rational decisions as a community
- 6...



Design for San Diego's 2017 Civic Challenge

How do we create a San Diego where we all move freely?

[GET INVOLVED](#)

OR

[LEARN MORE](#)


KEY DATES

Human-Centered Design Course at UCSD
Oct 3-19 • UCSD main campus

D4SD Poster Session, Design Forward mixer
Oct 25 • Broadway Pier

D4SD Award Ceremony, Design Forward Summit
Oct 26 • Liberty Station

LATEST TWEET

 @Design4SD

We thank everyone for joining us and making the D4SD challenge a success.

DASD



SCALE

SMART CITIES ACCELERATOR
LABS + ENVIRONMENT





Steven Dow
Advancing Collective Innovation



Steven Dow
Advancing Collective Innovation



CHALLENGE: Accessibility

Beach Access For All



Daniel Lenzen, Andrea Flagiello, Matt Abbondanzio, Tomas Robinson

CHALLENGE: Preparing for AVs



Selene Hoover, Garret Hoover, Jessica Yeung

CHALLENGE: Preparing for AVs

What is Navier?

A software and protocol for autonomous vehicles that pools cars together in lanes based on distance to their respective exits to make traffic flow without disruption.



Lucien Eloundou, Roshan Fernando, and Ian Carrasco

CHALLENGE: Bike Safety



Cycle Detection

Allowing bikes and smart cars to travel together safely.

D.J. Nelson, Savera Soin, James Maron, Stephen Cerruti



1st

\$5000

Community to

D4SD

D4SD

Design for San Diego

0001

PAY TO THE ORDER OF

Bike Transponder Cycle Detection

Date Oct 26, 2019

Five Thousand and 00/100

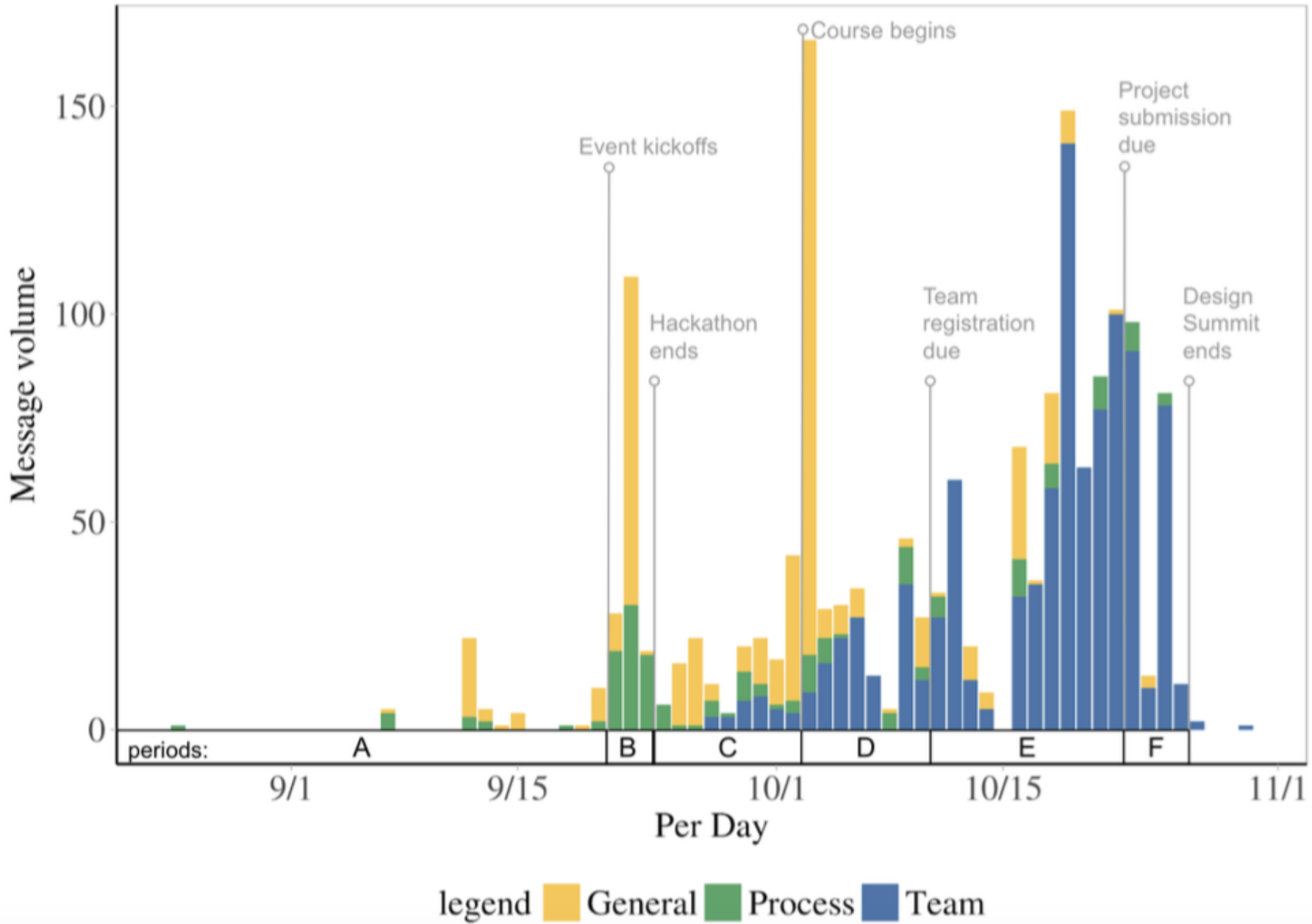
\$ 5,000.00

DOLLARS

Notes First Prize Congratulations

[Signature]

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Goals for D4SD

- Creating collective knowledge through competition
- Building social computing systems to facilitate
- Delivering a hybrid educational model
- Providing value for diverse stakeholders
- Combining ideas from design thinking, crowdsourcing, and organization science

D4SD

Get Ready for D4SD's 2020 Design Challenge

Design for San Diego (D4SD) is a city-wide human-centered design competition focused on exploring solutions to important civic challenges facing our region.

Innovators, volunteers, teachers, and sponsors...
find out how we can improve the city together.

[Learn More](#)

[Get Involved](#)

**How to Get
Involved Now**

Register Now for
the 2020 Design
Challenge

Offer Experiential
Learning to Your
Students

Volunteer as a
Mentor, Organizer,
Judge, Writer...

Sponsor D4SD
to Promote
Your Brand

Thank you!

spdow@ucsd.edu

 @StevenDow

d4sd.org

protolab.ucsd.edu

designlab.ucsd.edu

spdow.ucsd.edu

