

# Evaluating and Improving the Usability of Mechanical Turk for Low-Income Workers in India

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# The Rise of Paid Crowdsourcing

- In the last decade, over 1 million workers have earned \$1-2 billion via crowdsourced work\*

amazon mechanical turk  
Artificial Artificial Intelligence


txteagle

CrowdFlower

livework<sup>beta</sup>

samaSource

CrowdSifter

CastingWords

LeadVine<sup>BETA</sup>  
The community is your sales force.

LOGOTOURNAMENT

CloudCrowd  
We're working on it. Lots of us.

smartsheet  
THE POWER OF DONE

Data  
DISCOVERERS

- Opportunity for workers in developing regions?
  - Eliminates need for co-location and formal contracts
  - Flexible hours – can work in “free time”

# Mechanical Turk Changes Lives in India

- 36% of MTurk workers are in India [Ross'10]
- From our survey of 200 Indian Turkers (July 2010):

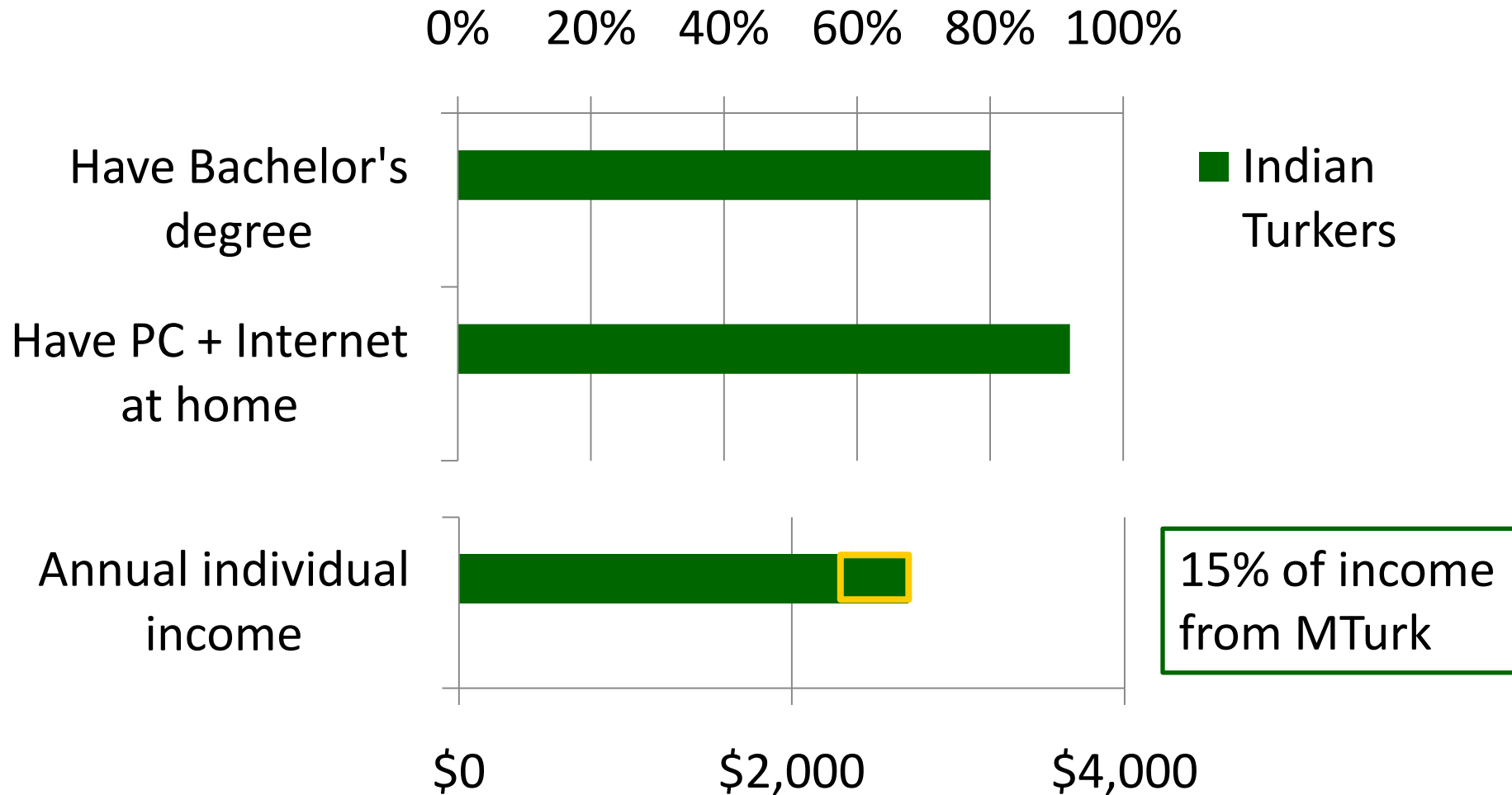
“I’m from a middle class family. After completing my degree I looked for job everywhere but failed. But when I found MTurk, it changed my life. It helped me a lot.”

— 26-year old college graduate from Kolkata. Earns \$1860 / year on Turk.

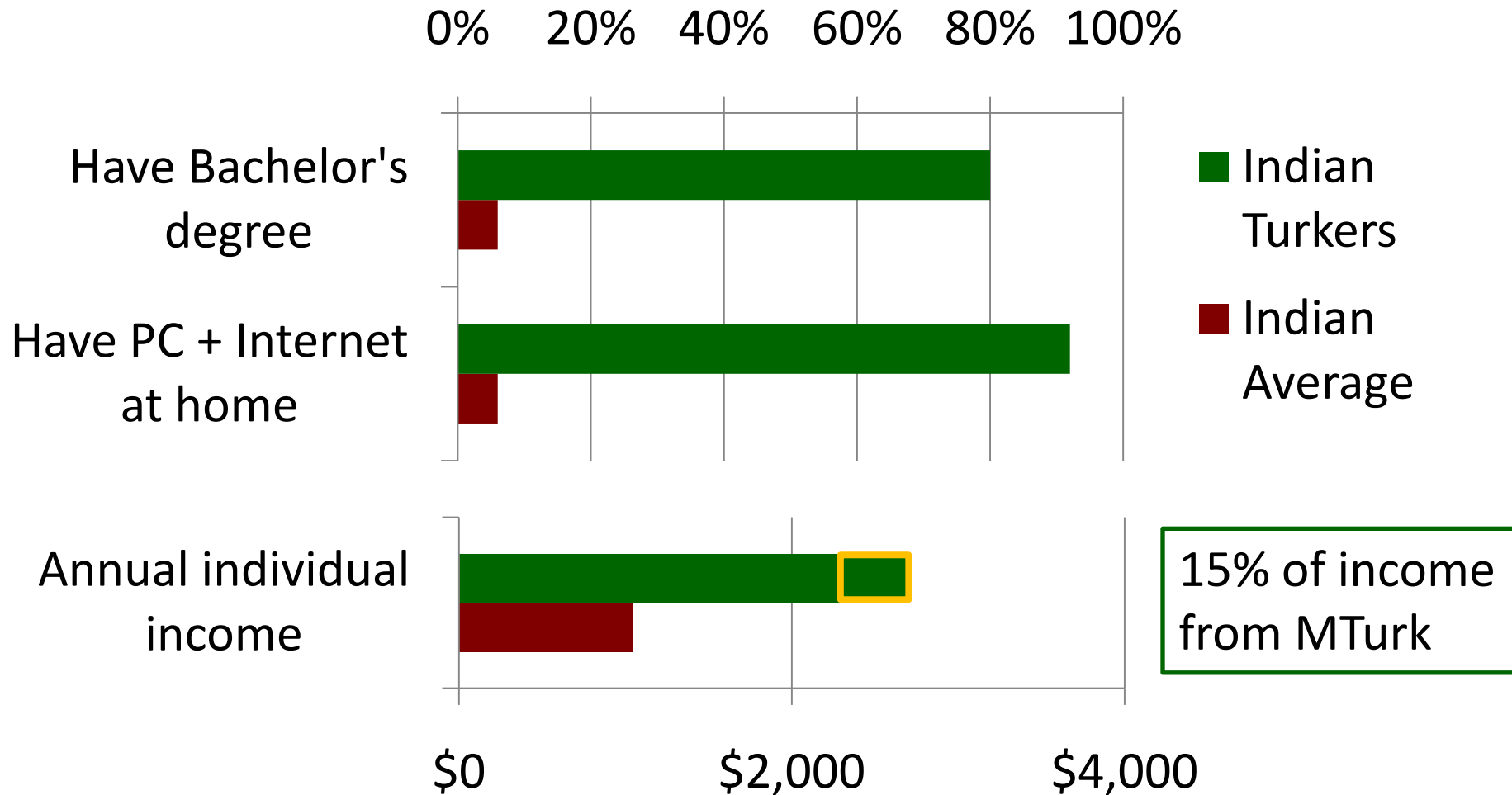
“MTurk [is] really an advantage to me, it helps me to pay my college fees myself. It made me to feel I’m on my own. I got the respect while studying by this reasonable income.”

— Respondent from Trichy. Earns \$1600 / year on Turk.

# But Most Users are in High-Income Group



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# Our Study: Evaluating and Improving MTurk for Low-Income Workers in India

- Methods:
  - Observe 7 users attempting various tasks on MTurk
  - Pick a single task (bounding box), iteratively refine UI
  - Evaluate 5 variations of user interface across 49 users
- Results:
  - The UI is a bottleneck for low-income users on MTurk
  - Language localization is necessary, but not sufficient
  - Simplified interfaces and task instructions can boost completion of bounding box task from 0% to 66%

# Closely Related Work

- Samasource
- txteagle
- CrowdFlower
- Prior studies of MTurk [[Ross'10](#)] [[Ipeirotis'10](#)]

# In This Talk

- Usability Barriers
- Iterative Design
- Earning Potential



# Focus: Lower-Income Urban Users

- Participants from two locations:
  - Office support staff: security guards, housekeeping, maintenance staff, etc.
  - Nonprofit IT training center: members with and without jobs, many students
- Median education: 12 years
- Median income: \$1330 / year
  - 2nd quintile (20-40%) for urban India
- Went to local-language school, but know basic English
- Have basic digital literacy, but no exposure to MTurk



*Outside the IT training center*

# Initial Observations

	Verify Address	Test New CAPTCHA	Label Image
Input Method	Text	Graphical	Graphical
Output Method	Text	Text	Graphical


- With each of 7 participants:
  - Participant registers on MTurk and attempts 1-2 tasks
  - Hour-long 1-on-1 session, providing help if needed

# Initial Observations

	Verify Address	Test New CAPTCHA	Label Image
<b>Input Method</b>	Text	Graphical	Graphical
<b>Output Method</b>	Text	Text	Graphical
<b>Inherent Barriers to Completing Task</b>			



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<b>Inherent Barriers to Completing Task</b>	<ul style="list-style-type: none"> <li>• Evaluating trust on Web</li> <li>• Nuanced use of language</li> </ul>	<ul style="list-style-type: none"> <li>• Ignoring truly illegible letters</li> <li>• Converting to unformatted text</li> </ul>	(Unfamiliar with using click-and-drag interaction)

- With each of 7 participants:
  - Hour-long 1-on-1 session, providing help if needed
  - Participant registers on MTurk and attempts 1-2 tasks

# Usability Barriers Across Tasks

The screenshot shows the Amazon Mechanical Turk interface. At the top, there are navigation tabs for 'Your Account', 'HITS', and 'Qualifications'. The user's name 'William Thies' and account settings are visible. The main area displays a task with a timer, search filters, and a 'Submit HIT' button. A task description asks the user to draw bounding boxes around objects in images. A list of instructions is provided, including a note about multiple instances. At the bottom, there are navigation controls for the task images.

Annotations with red arrows point to specific usability issues:

- Minimal separation of general and task-specific navigation:** Points to the top navigation tabs.
- Need to click "Accept Hit" prior to starting work:** Points to the 'Submit HIT' button.
- Going back in browser will lose work; need to click here to go back:** Points to the 'prev' button in the image navigation.
- Hard to find help:** Points to the 'SEE INSTRUCTIONS WITH EXAMPLES' link.

Minimal separation of general and task-specific navigation

Need to click "Accept Hit" prior to starting work

Going back in browser will lose work; need to click here to go back

Hard to find help

# Difficulty Understanding the Instructions

Finished with this HIT?  Let someone else do it?

Submit HIT

Return HIT

Total Earned:  
Total HITs Submitted:

Automatically accept the next HIT

Draw bounding boxes around objects in images

Requester:

Qualifications Required: None

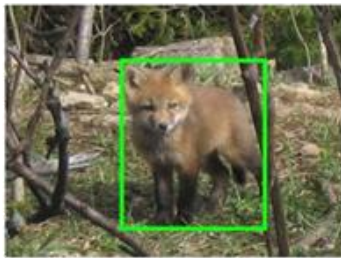
Reward: \$0.05 per HIT

HITs Available: 1754

Duration: 60 minutes

## Instructions of drawing bounding boxes, with examples for "Kit fox"

**Rule 1: Include all visible part and draw as tightly as possible.**



CORRECT



WRONG: must be as tight as possible!



WRONG: must include all visible parts!



CORRECT



WRONG: occluded parts do not matter as long as all visible parts are included.

Use of advanced language ("occluded")

Next

Finished with this HIT?  Let someone else do it?

Submit HIT

Return HIT

Automatically accept the next HIT



# Difficulty Understanding the Instructions

Finished with this HIT? Let someone else do it?

Submit HIT

Return HIT

Total Earned: \$0.31  
Total HITs Submitted: 25

Automatically accept the next HIT

Draw bounding boxes around objects in images

Requester: mlabel-dolores

Qualifications Required: None

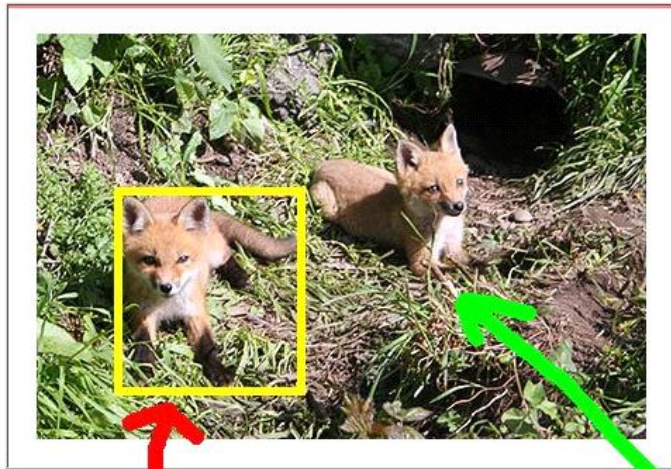
Reward: \$0.05 per HIT

HITs Available: 1754

Duration: 60 minutes

**Rule 3: DO NOT draw on an instance that already has a bounding box, as shown below in yellow. Draw on a new instance.**

Draw a box around **kit fox, prairie fox, Vulpes velox**: *small grey fox of the plains of western North America*



Already has a box. Do not draw on this one.

Draw on this one

Draw a bounding box around the following object in the image:

**kit fox, prairie fox, Vulpes velox**: small grey fox of the plains of western North America

Instructions:

- Include all visible parts and draw as tightly as possible
- **If there are multiple instances, pick only ONE ( any one ).**

[SEE INSTRUCTIONS WITH EXAMPLES](#)

Check here if there's NO kit fox, prairie fox, Vulpes velox in this image.

(Optional) Enter any comment you have:

prev NO. 6 submit

6 images in total. 0 left. 'Submit' button will show

Prev

Next

Finished with this HIT? Let someone else do it?

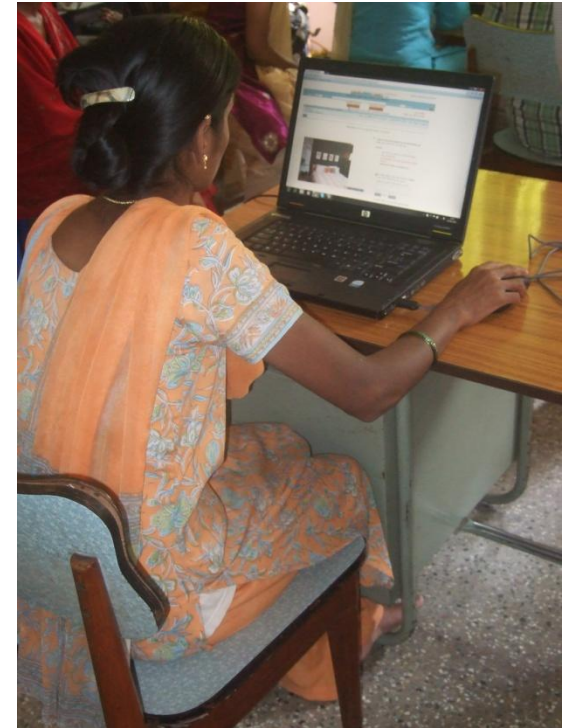
Submit HIT

Return HIT

Automatically accept the next HIT

# System is Unusable Without Assistance

- None of 9 users could label an image in 30 min
- Methodology used in this talk:
  - Task: outline an object (lamp) in each of 20 images
    - Or indicate that no lamp is present
    - Maximum time: 30 minutes
  - Users receive an overview of MTurk
  - But NO assistance is offered in understanding or doing the task



# Iterative Design and Evaluation

# Design 1: Translation to Local Language

ನಿಮ್ಮ ಖಾತೆ ಹೆಚ್.ಐ.ಟಿ. ವಿದ್ಯಾರ್ಹತೆ 136,548 ಹೆಚ್.ಐ.ಟಿ. ಲಭ್ಯವಿದೆ | ಮಾತೆಯ ರಚನೆ | ಹೊರನಡೆ | ಸಹಾಯ

ಎಲ್ಲಾ ಹೆಚ್.ಐ.ಟಿ. | ಲಭ್ಯವಿರುವ ಹೆಚ್.ಐ.ಟಿ. | ಹೆಚ್.ಐ.ಟಿ. ನಿಮಗೆ ನೀಡಿರುವುದು

ಹುಡುಕು ಹೆಚ್.ಐ.ಟಿ. | ಮಾಹಿತಿ | ಸಾಧ್ಯ ತಿಳಿಸುವುದಿಲ್ಲ | ಕನ್ನಡ | ಸಹಾಯ

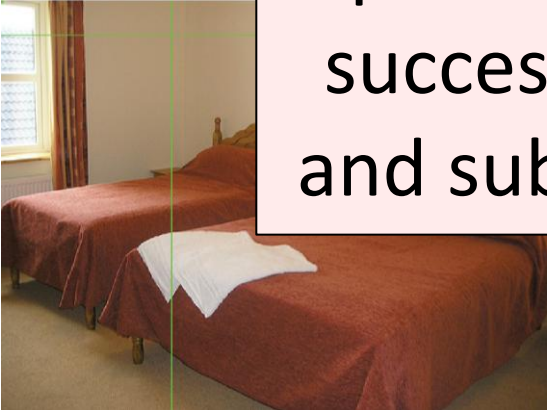
ಏರಿಕೊಳ್ಳಿ ಕೆಲವು ಕಾರ್ಡ್‌ಗಳು ಏರಿಕೊಳ್ಳಿ ಏರಿಕೊಳ್ಳಿ ಕೆಲವು ಕಾರ್ಡ್‌ಗಳು  
ಹೆಚ್.ಐ.ಟಿ. ಅಂಗೀಕರಿಸಿ ಹೆಚ್.ಐ.ಟಿ. ಮುಂದಕ್ಕೆ ತಿಳಿಸಿ

ಸ್ವಯಂಚಾಲಿತವಾಗಿ ಮುಂದಿನ ಘಾತವನ್ನು ಅಂಗೀಕರಿಸುವುದು

ಚಿತ್ರದಲ್ಲಿರುವ ವಸ್ತುಗಳ ಸುತ್ತ ಪರಿಮಿತಿ ಚೌಕಗಳನ್ನು ರಚಿಸಿ  
ಕೋರುವವರು: ಪ್ರತಿಫಲ: ಪ್ರತಿ ಘಾತಕ್ಕೆ 0.08 ರೂಪಾಯಿ ಲಭ್ಯವಿರುವ ಘಾತಗಳು: 10000 ಅಪ್ಪು: 10 ನಿಮಿಷಗಳು  
ಅಗತ್ಯ ಅರ್ಹತೆಗಳು : ಯಾವುದೂ ಇಲ್ಲ

ಪ್ರಭಾಸಿ

Still, none of 10 participants could successfully outline and submit an image



ಖಾಲಿ ಮಾಡುವ ಚೌಕ

ಹಿಂದಿನದು ಸಂಖ್ಯೆ 1 ಮುಂದಿನದು

ಒಟ್ಟು 10 ಚಿತ್ರಗಳು . ಉಳಿದವು 98. 'ಸಲ್ಲಿಸಿ' ಗುಂಡಿಯು ಕೊನೆಯ ಪುಟದಲ್ಲಿ ಕಾಣಿಸಿಕೊಳ್ಳುತ್ತದೆ.

ಕೆಲವು ಒತ್ತಿ ಮತ್ತು ಚೌಕವನ್ನು ಎಳೆಯಿರಿ.

ಏರಿಕೊಳ್ಳಿ ಕೆಲವು ಕಾರ್ಡ್‌ಗಳು ಏರಿಕೊಳ್ಳಿ ಕೆಲವು ಕಾರ್ಡ್‌ಗಳು  
ಹೆಚ್.ಐ.ಟಿ. ಅಂಗೀಕರಿಸಿ ಹೆಚ್.ಐ.ಟಿ. ಮುಂದಕ್ಕೆ ತಿಳಿಸಿ

ಸ್ವಯಂಚಾಲಿತವಾಗಿ ಮುಂದಿನ ಘಾತವನ್ನು ಅಂಗೀಕರಿಸುವುದು

# Design 2: New Instructions and Interface

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## Original Instructions

## New Instructions

Rule 1: Include all visible part and draw as tightly as possible.

CORRECT      WRONG: must be as tight as possible!      WRONG: must include all visible parts!

CORRECT      WRONG: excluded parts do not matter as long as all visible parts are included.

Rule 2: If there are multiple instances, include only ONE (any one).

CORRECT      CORRECT      WRONG: should include only one instance!

Rule 3: DO NOT draw on an instance that already has a bounding box, as shown below in yellow. Draw on a new instance.

Main | Instructions with examples | Look up "kit fox" in Wikipedia | In Google

Draw a box around **kit fox, prairie fox, Vulpes velox**. small grey fox of the plains of western North America

Draw a bounding box around the following object in the image:

Already has a box. Do not draw on this one.      Draw on this one

Instructions:

- Include all visible parts and draw as tightly as possible
- If there are multiple instances, pick only ONE (any one).

SEE INSTRUCTIONS WITH EXAMPLES

Check here if there's NO kit fox, prairie fox, Vulpes velox in this image.  
(Optional) Enter any comment you have:

press down and drag out the box

press down and drag out the box

Rule 4: If you cannot find the required object, or every instance already has a bounding box, check the checkbox as shown below.

Main | Instructions with examples | Look up "kit fox" in Wikipedia | In Google

Draw a box around **kit fox, Vulpes macrotis**. small grey fox of southwestern United States; dog fox; subspecies of prairie dog

Draw a bounding box around the following object in the image:

Already has a box. Do not draw on this one.      Draw on this one

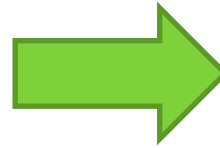
Instructions:

- Include all visible parts and draw as tightly as possible
- If there are multiple instances, pick only ONE (any one).
- If you cannot find the required object, or every instance already has a bounding box, check the checkbox as shown below.

SEE INSTRUCTIONS WITH EXAMPLES

Check here if there's NO kit fox, prairie fox, Vulpes macrotis in this image.  
(Optional) Enter any comment you have:

press down and drag out the box



Add Structure  
Simplify Language  
Improve Illustrations

• ಈ ಪ್ರಾಣಿಗಳಿಗೆ ನಿರ್ದಿಷ್ಟ ಕೆಲಸಗಳನ್ನು ಕೊಡಬೇಕು.  
• ನಿರ್ದಿಷ್ಟ ಕೆಲಸವನ್ನು ನಿರ್ದಿಷ್ಟವಾಗಿ ನಿರ್ಧರಿಸಿ.  
• ಒಂದೇ ಸಮಯದಲ್ಲಿ ಒಂದು ಪ್ರಾಣಿಯನ್ನು ಮಾತ್ರ ಕಂಡು, ಅದರ ಬಗ್ಗೆ ಒಂದು ಪ್ರಾಣಿಯನ್ನು ಬರೆಯಬೇಕು.

1 ಉದಾಹರಣೆ: ಈ ಚಿತ್ರದಲ್ಲಿ ನಿಮ್ಮ ಗುರಿ **ಮೀನು**.

2 ಚಿತ್ರದಲ್ಲಿರುವ ಮೀನನ್ನು ಕಂಡುಹಿಡಿದು, ಅದರ ಬಗ್ಗೆ ಒಂದು ಪ್ರಾಣಿಯನ್ನು ಬರೆಯಿರಿ. ಪ್ರಾಣಿ ಬರೆಯಲು, ಕೆಲಸವನ್ನು ನಿರ್ದಿಷ್ಟವಾಗಿ ನಿರ್ಧರಿಸಿ.

3 ಪ್ರಾಣಿ ಕೆಲಸವನ್ನು ನಿರ್ದಿಷ್ಟವಾಗಿ ನಿರ್ಧರಿಸಿ.

4 ಪ್ರಾಣಿ ಕೆಲಸವನ್ನು ನಿರ್ದಿಷ್ಟವಾಗಿ ನಿರ್ಧರಿಸಿ.

5 ಒಂದು ಚಿತ್ರದಲ್ಲಿ ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚು ಗುರಿ ಇದ್ದರೆ, ಒಂದು ಬಗ್ಗೆ ಒಂದು ಪ್ರಾಣಿಯನ್ನು ಬರೆಯಿರಿ.

6 ಗುರಿ ಚಿತ್ರದಲ್ಲಿ ಇಲ್ಲದಿದ್ದರೆ ಲಾಗ್‌ನಲ್ಲಿ ಇರುವ 'ಈ ಚಿತ್ರದಲ್ಲಿ ಗುರಿ ಇಲ್ಲ' ಬಟನ್‌ನ್ನು ಒತ್ತಿ.

7 ಸರಿಯಾದ ಪ್ರಾಣಿಯನ್ನು ಬರೆಯಲು ಮುಗಿದರೆ, ಮುಂದುವರಿಯಲು ಲಾಗ್‌ನಲ್ಲಿ ಇರುವ 'ಒಂದು ಪ್ರಾಣಿಯನ್ನು ಬರೆಯಿರಿ' ಬಟನ್‌ನ್ನು ಒತ್ತಿ.

ಈ ಪ್ರಾಣಿಗಳಿಗೆ 20 ಚಿತ್ರಗಳು ಇವೆ. ಆದರೆ, 30 ನಿಮಗಿಗಾಗಿ ನಿರ್ದಿಷ್ಟವಾಗಿ ನಿರ್ಧರಿಸಿ.

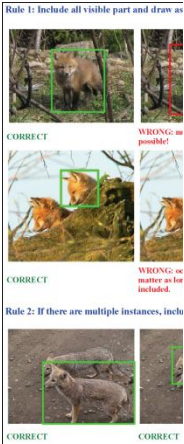
ಶುರು ಮಾಡಿ

# Design 2: New Instructions and Interface

Original

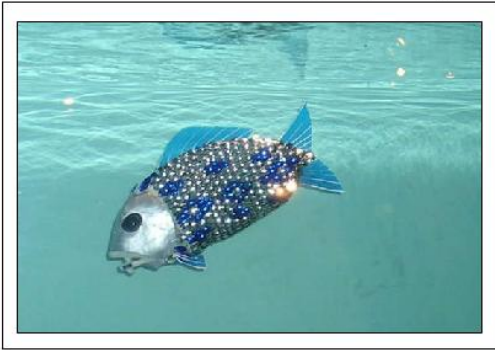
- ಈ ಪ್ರಾಜೆಕ್ಟಿನಲ್ಲಿ ನಿಮಗೆ ಕೆಲವು ಚಿತ್ರಗಳನ್ನು ತೋರಿಸುತ್ತೇವೆ.
- ನಿಮಗೆ ಒಂದು ವಸ್ತು ಗುರಿಯಾಗಿ ಸಿಗುತ್ತದೆ.
- ಒಂದೊಂದು ಚಿತ್ರದಲ್ಲಿ ಆ ವಸ್ತುವನ್ನು ನೀವು ಹುಡುಕಿ, ಅದರ ಮೇಲೆ ಒಂದು ಬೊಕ್ಷನ್ನು ಬರೆಯಬೇಕು.

Instructions



1

ಉದಾಹರಣೆಗಾಗಿ : ಈ ಚಿತ್ರದಲ್ಲಿ ನಿಮ್ಮ ಗುರಿ ಮೀನು.



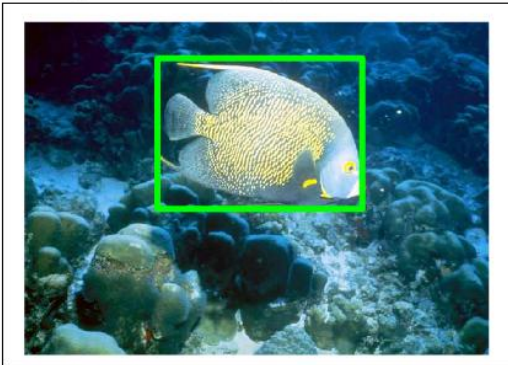
ನಿ ಬಾಕ್ಸ್ ಬರೆಯಿರಿ.

ನಿ ಬರೆಯಿರಿ.



2

ಚಿತ್ರದಲ್ಲಿರುವ ಮೀನನ್ನು ಕಂಡುಹಿಡಿದು, ಅದರ ಮೇಲೆ ಒಂದು ಬೊಕ್ಷನ್ನು ಬರೆಯಿರಿ. ಬಾಕ್ಸ್ ಬರೆಯಲು, ಕಂಪ್ಯೂಟರಿನ ಮೌಸನ್ನು ಉಪಯೋಗಿಸಿ.



ಬಾಕ್ಸ್ ಬರೆಯಿರಿ.



ಬಾಕ್ಸ್ ಬರೆಯಿರಿ.

ಬಾಕ್ಸ್ ಬರೆಯಿರಿ.

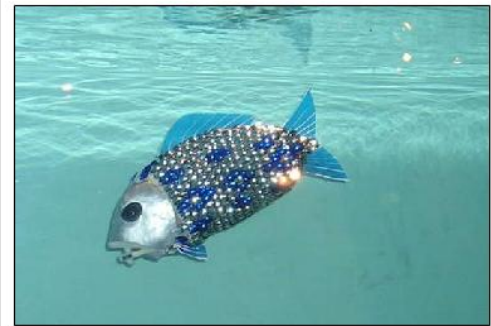
ಬಾಕ್ಸ್ ಬರೆಯಿರಿ.

ಈ ಪ್ರಾಜೆಕ್ಟಿನಲ್ಲಿ ನಿಮಗೆ ಕೆಲವು ಚಿತ್ರಗಳನ್ನು ತೋರಿಸುತ್ತೇವೆ.

# Design 2: New Instructions and Interface

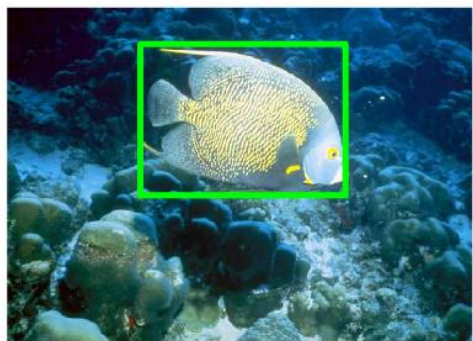
- In this project we will show you some pictures.
- You will get a target object.
- In each picture, you should search for that object and draw a box around it.

1



For example: In this picture, your target is fish.

2



Search and find the fish in the picture, and then draw a box around it. To draw the box, use the computer's mouse.



# Design 2: New Instructions and Interface

ಮಾತೆಯ ರಚನೆ | ಹೊರನಡೆ | ಸಹಾಯ

ನಿಮ್ಮ ಖಾತೆ | ಹೆಚ್.ಐ.ಟಿ. | ವಿದ್ಯಾರ್ಹತೆ | 136,548 ಹೆಚ್.ಐ.ಟಿ.  
ಲಭ್ಯವಿದೆ

ಎಲ್ಲಾ ಹೆಚ್.ಐ.ಟಿ. | ಲಭ್ಯವಿರುವ ಹೆಚ್.ಐ.ಟಿ. | ಹೆಚ್.ಐ.ಟಿ. ನಿಮಗೆ ನೀಡಿರುವುದು

ಹುಡುಕು  ಹೆಚ್.ಐ.ಟಿ.  ಮಾಹಿತಿ

ಸ್ವಯಂಚಾಲಿತವಾಗಿ ಮುಂದಿನ ಘಾತವನ್ನು ಆಂಗೀಕರಿಸುವುದು

ಚಿತ್ರದಲ್ಲಿರುವ ವಸ್ತುಗಳ ಸುತ್ತ ಪರಿಮಿತಿ ಚೌಕಗಳನ್ನು ರಚಿಸಿ  
 ಕೋರುವವರು:  ಪ್ರತಿಘಟನೆ: ಪ್ರತಿ ಘಾತಕ್ಕೆ ೦.೦೫ ರೂಪಾಯಿ

ಆಗತ್ಯ ಅರ್ಹತೆಗಳು : ಯಾವುದೂ ಇಲ್ಲ

ದಿನಪದ ಸುತ್ತ ಒಂದು ಚೌಕ ರಚಿಸಿ; ಕಣ್ಣಿಗೆ ಕಾಣುವ ಗಳನ್ನು ಒಂದು ಕೃತಕ ಆಕರ

ಚಿತ್ರದಲ್ಲಿ ಕೆಳಗೆ ಸಮೂಹೀಕರಿಸಿದ ವಸ್ತುವಿನ ಸುತ್ತ ಒಂದು ಪರಿಮಿತಿ ಚೌಕವನ್ನು ರಚಿಸಿ.  
ದಿನಪದ : ಕಣ್ಣಿಗೆ ಕಾಣಿಸುವ ಗಳನ್ನು ಒಂದು ಕೃತಕ ಆಕರ

**ಸೂಚನೆಗಳು:**

ಕಣ್ಣಿಗೆ ಕಾಣಿಸುವ ಎಲ್ಲ ಘಾತಗಳನ್ನೂ ಒಳಗೊಳ್ಳುವಂತೆ ಸಾಧ್ಯವಾದ  
ವಷ್ಟೆ ಅಡಕವಾಗಿ ರಚಿಸಿ.  
**ಅನೇಕ ಉದಾಹರಣೆಗಳು ಇದ್ದರೆ ಒಂದೇ ಒಂದನ್ನು ಮಾತ್ರ  
ಅರಿವಿಕೊಳ್ಳಿ (ಯಾವುದಾದರೊಂದು)**  
ಈಗಾಗಲೇ ಪರಿಮಿತಿ ಚೌಕಗಳು ಇರುವ ಉದಾಹರಣೆಗಳ ಮೇಲೆ  
ರಚಿಸ ಡಿ.

- ಈ ಚಿತ್ರದಲ್ಲಿ ದಿನಪದ ಇಲ್ಲದಿದ್ದರೆ ಅಥವಾ ಪ್ರತಿಯೊಂದು ಉದಾಹರಣೆಗೂ ಆಗಲೇ ಪರಿಮಿತಿ ಚೌಕವಿದ್ದರೆ ಇರಿಸಿ. ಚಿತ್ರ ಹೆಚ್ಚು (ಏಕೈಕ) ನಿಮ್ಮ ಅಭಿಪ್ರಾಯ ಬಹಳವರೂ ಇದ್ದರೆ ಇಲ್ಲಿ ನಮೂನಿಸಿ

ಒಟ್ಟು ೨೦ ಚಿತ್ರಗಳು . ಉಳಿದವು ೧೯. 'ಸಲ್ಲಿಸಿ' ಗುಂಡಿಯು ಕೊನೆಯ ಪುಟದಲ್ಲಿ ಕಾಣಿಸಿಕೊಳ್ಳುತ್ತದೆ.

ಕೆಳಗೆ ಒತ್ತಿ ಮಾತ್ರ ಚೌಕವನ್ನು ಎಳೆಯಿರಿ.



ಖಾಲಿ ಮಾಡುವ ಚೌಕ

ಏನಿಲ್ಲ, ಟಿ.ಐ.ಐ.ಟಿ. ಕಂಪ್ಯೂಟರ್‌ನಲ್ಲಿ ಕಂಡುಬಂದಿದೆ | ಏನಿಲ್ಲ, ಟಿ.ಐ.ಐ.ಟಿ. ಕಂಪ್ಯೂಟರ್‌ನಲ್ಲಿ ಕಂಡುಬಂದಿದೆ

ಸ್ವಯಂಚಾಲಿತವಾಗಿ ಮುಂದಿನ ಘಾತವನ್ನು ಆಂಗೀಕರಿಸುವುದು

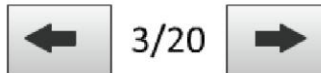
# Design 2: New Instructions and Interface

ಈ ಚಿತ್ರಗಳಲ್ಲಿ ನಿಮ್ಮ ಗುರಿ: ಲ್ಯಾಂಪ್ (ದೀಪ).

ಒಂದೊಂದು ಚಿತ್ರದಲ್ಲಿರುವ ದೀಪವನ್ನು ಹುಡುಕಿ, ಆದರ ಮೇಲೆ ಬಾಕ್ಸ್ ಬರೆಯಿರಿ.



ಈ ಚಿತ್ರದಲ್ಲಿ ಗುರಿ ಇಲ್ಲ.



# Design 2: New Instructions and Interface

- In this picture, your target is: lamp.
- Look for the lamp in each picture and draw a box over it.



The target is not present in this picture.

# Evaluation

Design	Images Annotated Correctly
0. Original MTurk (English)	0
1. Original MTurk (Kannada)	0

# Evaluation

Design	Images Annotated Correctly
0. Original MTurk (English)	0
1. Original MTurk (Kannada)	0
<b>2. New Instructions, New Interface (Kannada)</b>	<b>66%</b>

# Evaluation

Design	Images Annotated Correctly
0. Original MTurk (English)	0
1. Original MTurk (Kannada)	0
2. New Instructions, New Interface (Kannada)	66%

# Evaluation

Design	Images Annotated Correctly
0. Original MTurk (English)	0
1. Original MTurk (Kannada)	0
2. New Instructions, New Interface (Kannada)	66%
<b>3. Video Instructions, New Interface (Kannada)</b>	

# Evaluation

Design	Images Annotated Correctly
0. Original MTurk (English)	0
1. Original MTurk (Kannada)	0
2. New Instructions, New Interface (Kannada)	66%
<b>3. Video Instructions, New Interface (Kannada)</b>	<b>63%</b>



# Evaluation

Design	Images Annotated Correctly
0. Original MTurk (English)	0
1. Original MTurk (Kannada)	0
2. New Instructions, New Interface (Kannada)	66%
3. Video Instructions, New Interface (Kannada)	63%

# Evaluation

Design	Images Annotated Correctly
0. Original MTurk (English)	0
1. Original MTurk (Kannada)	0
2. New Instructions, New Interface (Kannada)	66%
3. Video Instructions, New Interface (Kannada)	63%
<b>4. Video Instructions (Kannada), Original Interface (English)</b>	

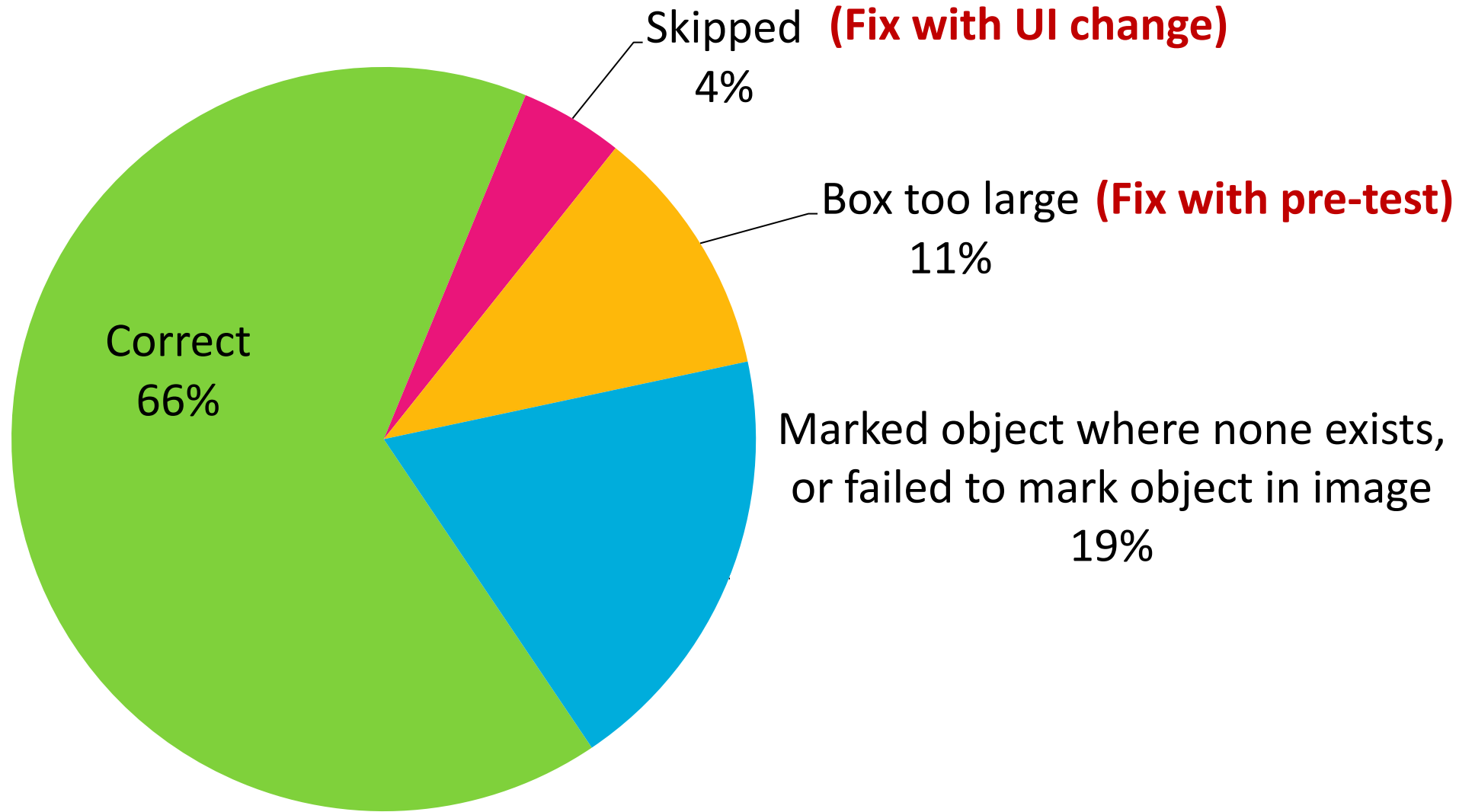
# Evaluation

Design	Images Annotated Correctly
0. Original MTurk (English)	0
1. Original MTurk (Kannada)	0
2. New Instructions, New Interface (Kannada)	66%
3. Video Instructions, New Interface (Kannada)	63%
<b>4. Video Instructions (Kannada), Original Interface (English)</b>	<b>40%</b>

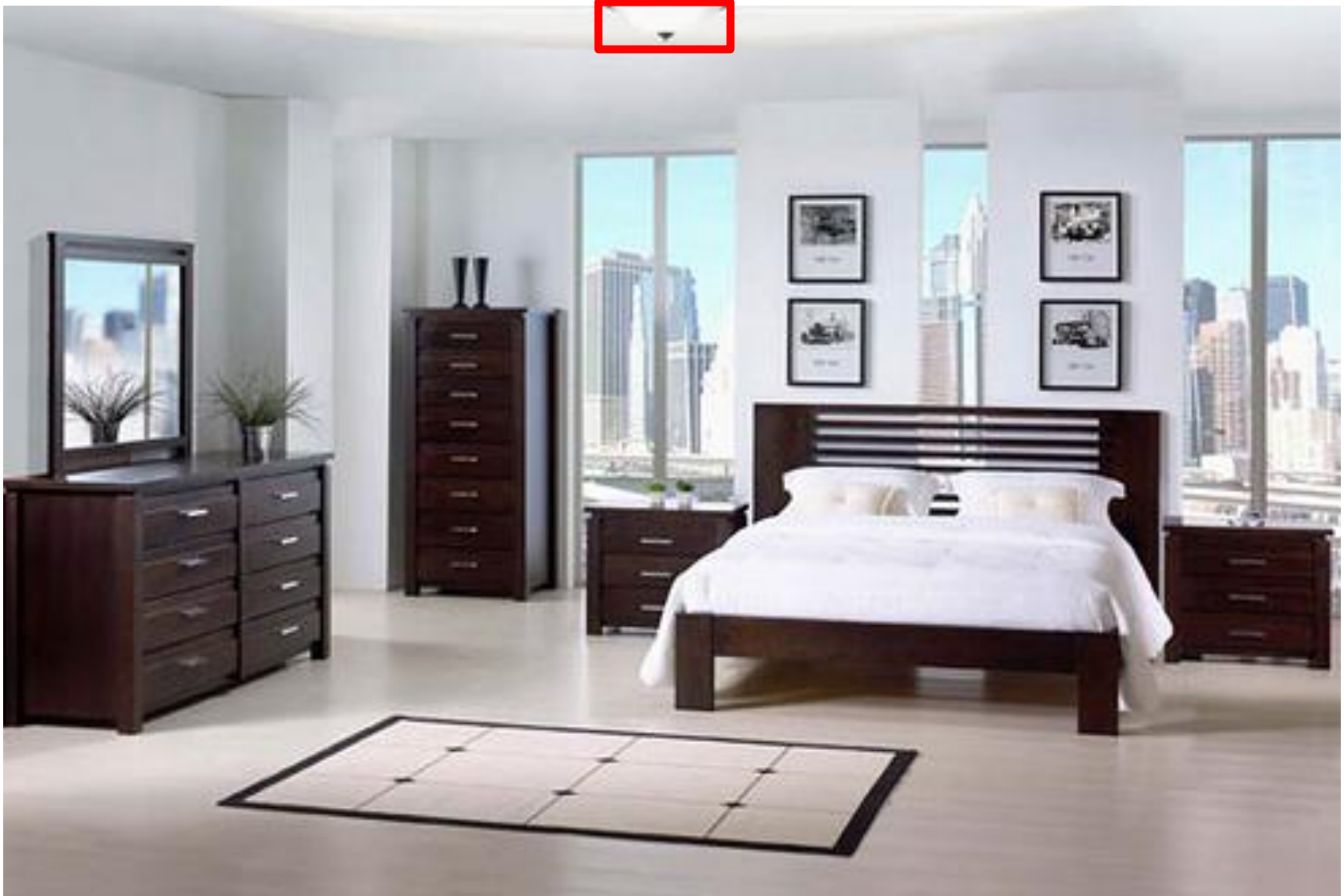
# Evaluation

Design	Images Annotated Correctly
0. Original MTurk (English)	0
1. Original MTurk (Kannada)	0
2. New Instructions, New Interface (Kannada)	66% ✓
3. Video Instructions, New Interface (Kannada)	63% ✓
4. Video Instructions (Kannada), Original Interface (English)	40%

# Sources of Error



# Errors Due to Cultural Context?



# Errors Due to Cultural Context?



# Errors Due to Intrinsic Difficulty of Task

Disagreement  
among authors:



Participant found lamp that we did not:





# Workers' Earning Potential

# Workers' Earnings Potential

- Bounding box tasks pays \$0.05 for 20 images
  - Accuracy requirements unknown (we assume 75%)

	Time to Submit 20 Images	Gross Payment
Median participant	7m 20s	\$0.41 / hr

- Baseline wage for median participant is \$0.83 / hr

# Workers' Earnings Potential

- Bounding box tasks pays \$0.05 for 20 images
  - Accuracy requirements unknown (we assume 75%)

	Time to Submit 20 Images	Gross Payment
Fastest participant	1m 32s	\$1.96 /hr
Median participant	7m 20s	\$0.41 / hr
Slowest participant	23m 49s	\$0.13 / hr

- Baseline wage for median participant is \$0.83 / hr

# Workers' Earnings Potential

- Bounding box tasks pays \$0.05 for 20 images
  - Accuracy requirements unknown (we assume 75%)

	Time to Submit 20 Images	Gross Payment	Net Earnings (paying \$0.30 / hr for Internet)
Fastest participant	1m 32s	\$1.96 /hr	\$1.52 / hr
Median participant	7m 20s	\$0.41 / hr	\$0.11 / hr
Slowest participant	23m 49s	\$0.13 / hr	-\$0.17 / hr

- Baseline wage for median participant is \$0.83 / hr

# Conclusions

- MTurk has yet to reach low-income workers in India
- We expose new barriers to usage by this group
  - Textual tasks difficult, but graphical tasks within reach
  - Current instructions and interfaces are a bottleneck
- We demonstrate that new designs can overcome barriers, improving image labeling from 0 to 66%
- Additional research needed to improve earnings
  - Increasing speed of task completion
  - Reducing cost of computer access
  - Making it easier to author usable tasks

# Extra Slides

# Design Recommendations

## How to Design Microtasking Sites for Low-Income Workers?

- Improved instructions and interfaces are needed
  - Use simple, clear illustrations for each task
  - Minimize visual complexity
  - Streamline navigation
  - Anticipate sequencing of steps
- Language localization is necessary but not sufficient
- Video instructions work comparably to simplified text instructions, and thus are unlikely to be worth it

# MTurk and Professional Development

- Microtasking can pose hazards to workers [\[Zittrain'08\]](#)
  - No affiliation with a team
  - Inability to understand moral implications of work
  - No working regulations, e.g., on wages or hours
- Is not necessarily limited to menial tasks
  - Creative tasks: design logos, taglines, graphics, etc.
  - Skilled tasks: writing, copyediting, programming, etc.
  - Thus could be a pathway to higher-level employment
- Might be more suitable for supplemental income
  - Offers extreme flexibility relative to other employment