Motivation
• How-to videos are valuable for teaching
• Searching for how-to videos is difficult. Users often have to skim many videos to find the right one
• Having video annotations would improve searching, browsing, and indexing videos

Problem
Generating video annotations is difficult
• Manually annotating each video is cumbersome
• Using computer vision requires training data

Research Question
Can a crowdsourcing method be efficient and scalable enough to generate annotations for how-to videos?
• Using Photoshop how-to videos as our example domain
• Testing our proposed method on Amazon Mechanical Turk

Online Experiment
Annotation Accuracy from a Mechanical Turk Experiment

Future Work
• Improve analytic tools for the workflow
• Pipeline subtasks together automatically
• Reduce number of crowdsourcing tasks / video

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Generating Annotations for How-to Videos Using Crowdsourcing
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Task 1: Capture Time Marks
The worker watches a 60s clip of a how-to video and clicks the “Tool Clicked” button whenever the instructor clicks on a tool.

Task 2: Label Tools Used
The worker labels the tool used in a 20s clip of a how-to video with drop down menus.

Task 3: Capture Before/After Images
The worker watches a 20s clip of a how-to video and captures the before and after images for a tool use.

Capturing Time Marks
• The size of the video player made it hard for workers to see what is going on
• Workers still had trouble knowing when instructor clicks on tool

Labeling Tools Used
• All videos are labeled correctly with majority voting
• Workers had trouble selecting the correct label if multiple labels seem similar (“Gradient” vs. “Gradient Map”)

Capturing Before/After Images
• Most of the incorrect before and after were due to bad video clips (choosing before image of an incorrect tool in clip)
• Some errors were due to dialog obstructions

Finding Before and After Images in Photoshop

Task

Find Before and After Images in Photoshop

Information
In this task, the instruction is to use the Region Selection tools in Photoshop. We would be the boxes and the other image for Region Selection.

Instruction
1. Select the tool as in the examples below.
2. Select the Before Image when you see the Before Image. When you see a Before Image, you should select the Before Image. When you see an After Image, you should select the After Image. Region Selection.
3. Select the tool as in the examples below.
4. Select the tool as in the examples below.

Finish
When you are done, the submit.

Click When Tools Are Used in Photoshop
Tutorial
• View this tool help topic, you can choose a topic tutorial.

Instructions
1. View this tool help topic, you can choose a topic tutorial.
2. Click on the tool with the correct color.
3. Click on the tool with the correct color.

Find Before and After Images

Task

Find Before and After Images in Photoshop

Information
In this task, the instruction is to use the Region Selection tools in Photoshop. We would be the Before Image and the other image for Region Selection.

Instruction
1. Select the tool as in the examples below.
2. Select the tool as in the examples below.
3. Select the tool as in the examples below.
4. Select the tool as in the examples below.

Finish
When you are done, the submit button.