Subjective Problems

Danna Gurari
The University of Texas at Austin
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https://www.ischool.utexas.edu/~dannag/Courses/CrowdsourcingForCV/CourseContent.html

Review

- Last week:
  - Visual question answering and dialog applications
  - Evaluation for visual question answering
  - Crowdsourcing for visual question answering
  - Crowdsourcing for visual dialog

- Assignments (Class Website & Canvas)
  - Project outline due yesterday
  - Project prototype demo due today
  - Project presentation due in three weeks

- Questions?

Today's Topics

- Subjective problems and applications with visual data
- Crowdsourcing subjective opinions about visual data
- Class activity: brainstorm, choose, & design future dataset creation
- Lab: final project discussion and open lab

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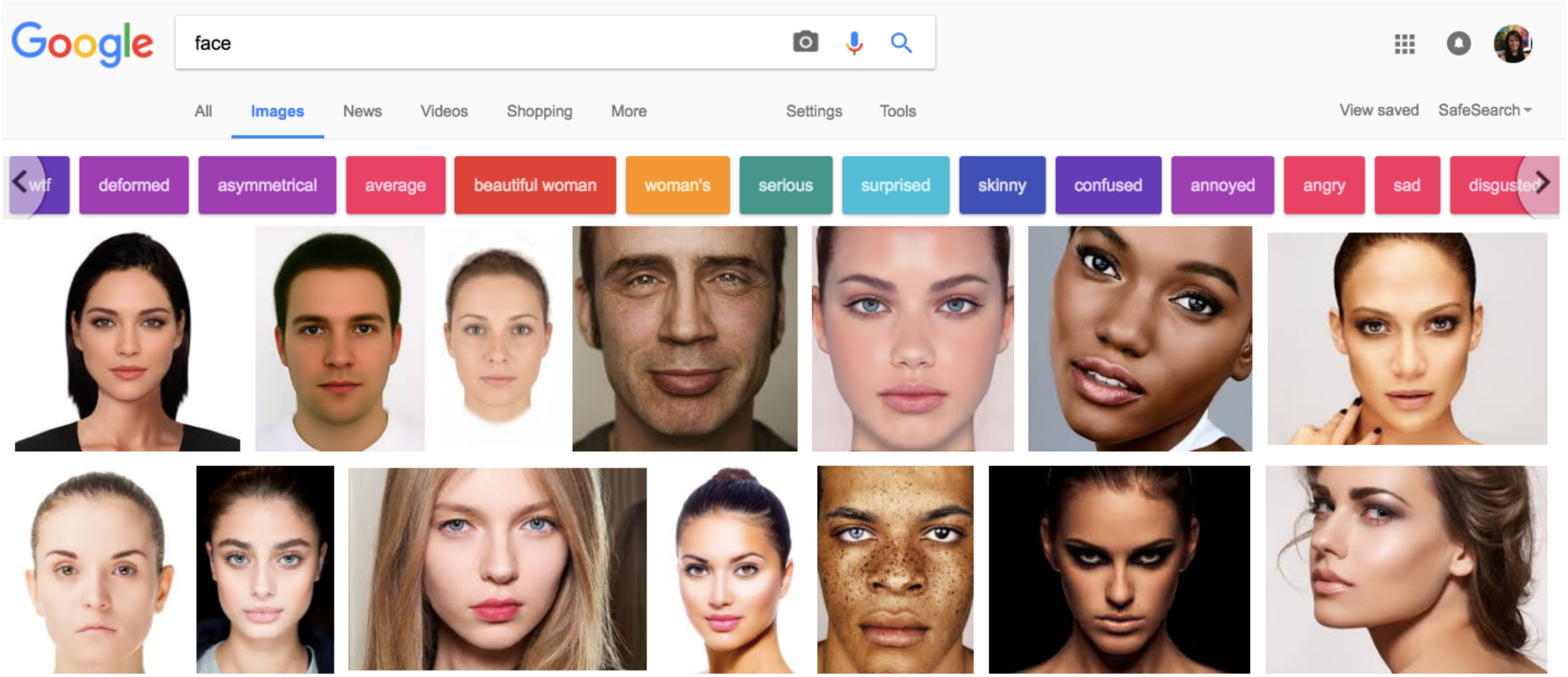
Subjective Problems

What are these? Tasks where people can hold different, yet valid opinions based on their personal ideas, feelings, or tastes

What aren’t these? Tasks with a single, objective truth

Applications: Image Search



Applications: Company/Product Advertising

- e.g., what logo?
- e.g., what website images?
- e.g., what paid advertisements?

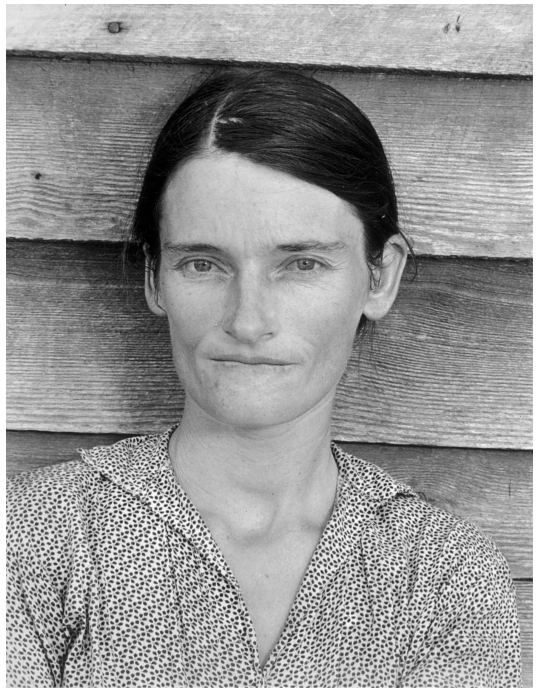
Applications: Social Networking

- How to post popular/memorable/funny/viral posts?

Figure credit: http://www.mysocialstream.com/blog/2017-08-21-unique-strategies-to-make-your-social-media-posts-go-viral/

Applications: Journalism

- How to use images to convey desired emotions?
  - e.g., what does she feel?



https://upload.wikimedia.org/wikipedia/commons/2/26/Allie_Mae_Burroughs_print.jpg

Today's Topics

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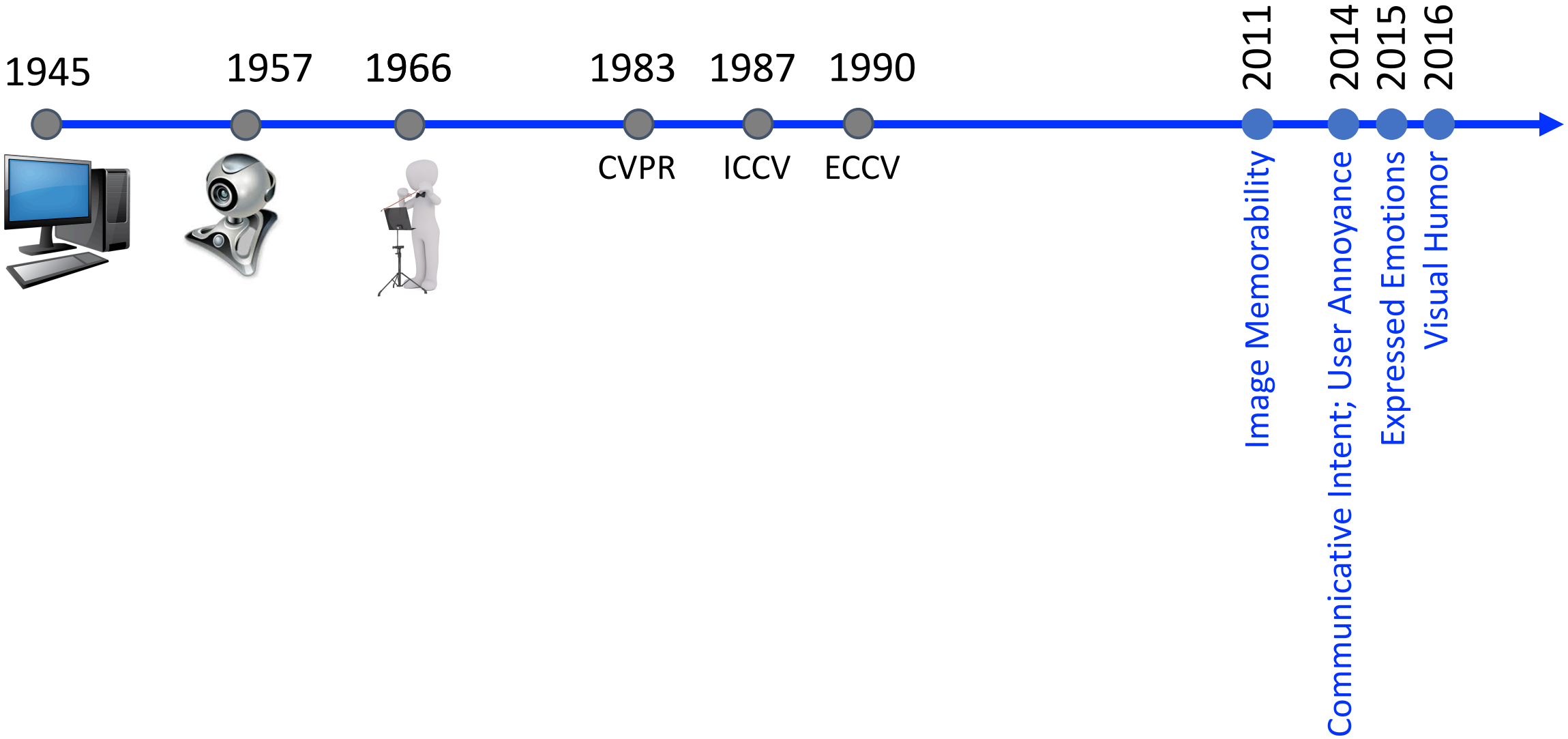
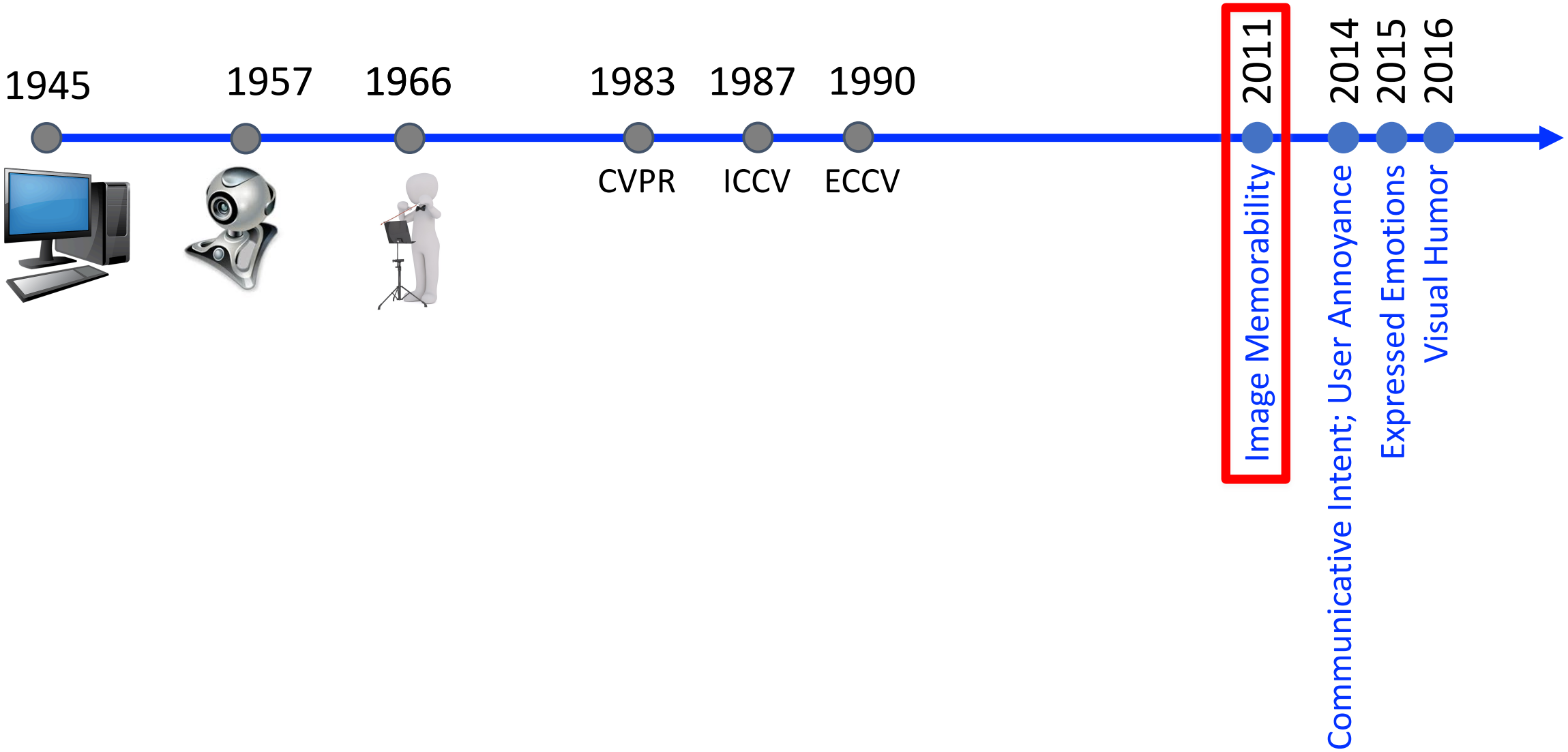
- Lab: final project discussion and open lab

Subjective Problem Studies



Subjective Problem Studies



Subjective Problem: Image Memorability

What images are memorable?

Phillip Isola, Jianxiong Xiao, Antonio Torralba, and Aude Oliva. “What Makes an Image Memorable?” CVPR 2011.

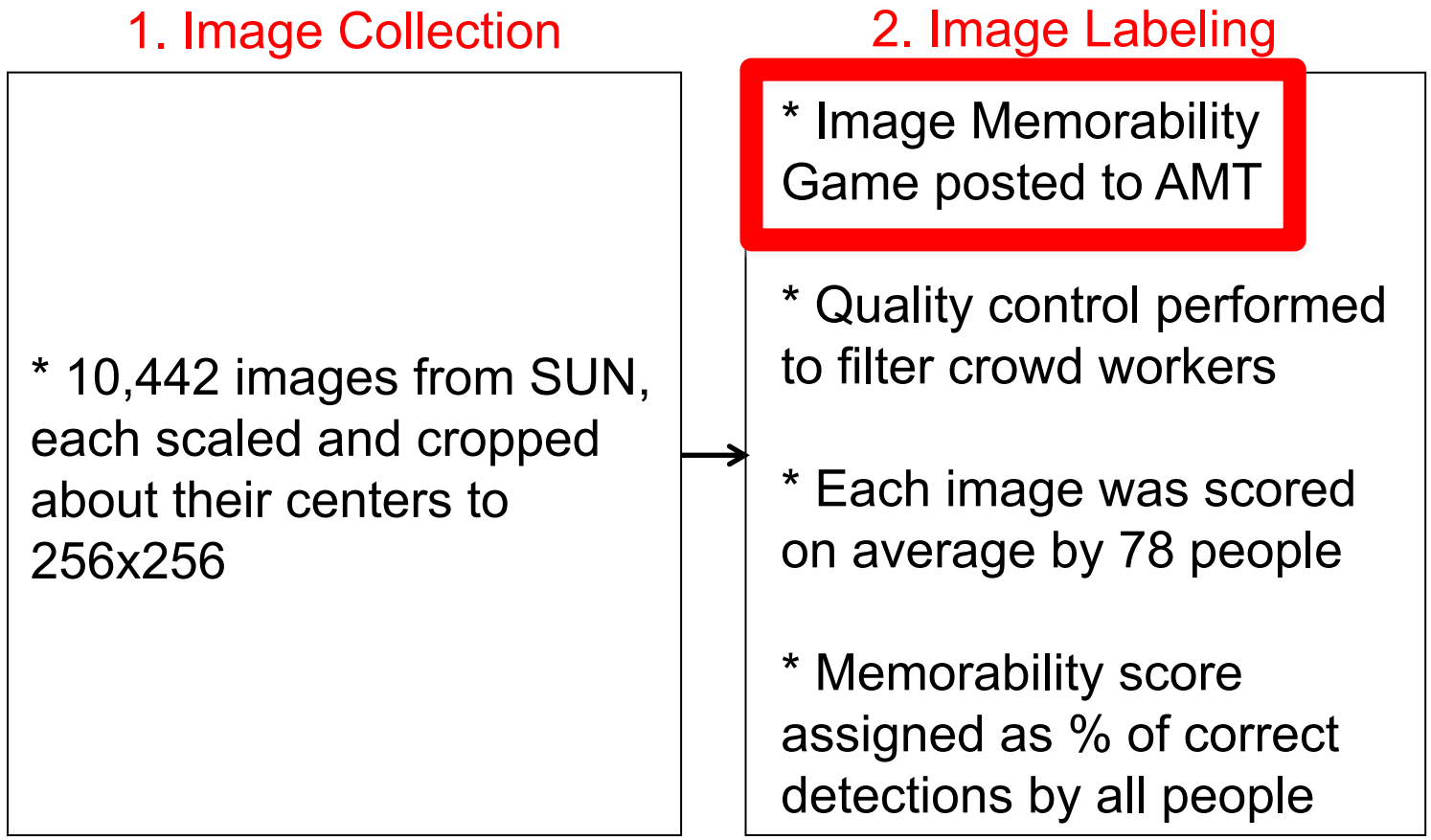
Subjective Problem: Image Memorability

1. Image Collection

* 10,442 images from SUN, each scaled and cropped about their centers to 256x256

Phillip Isola, Jianxiong Xiao, Antonio Torralba, and Aude Oliva. “What Makes an Image Memorable?” CVPR 2011.

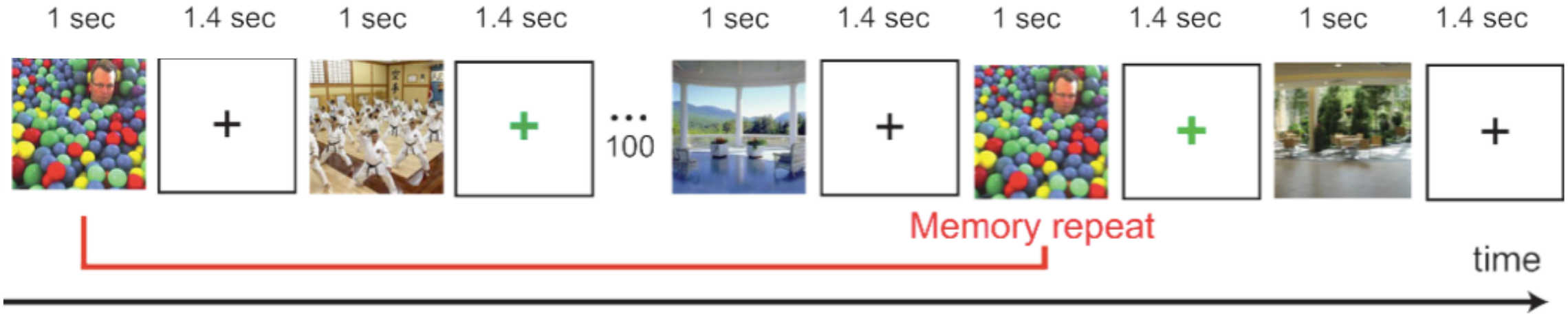
Subjective Problem: Image Memorability



Phillip Isola, Jianxiong Xiao, Antonio Torralba, and Aude Oliva. “What Makes an Image Memorable?” CVPR 2011.

Subjective Problem: Image Memorability

- Image Memorability Game posted to AMT
  - Sequence of 120 images shown over span of ~5 minutes
  - Each image displayed for 1 second followed by 1.4 second gap
  - Task: press space bar whenever a repeat of a previously shown image is shown



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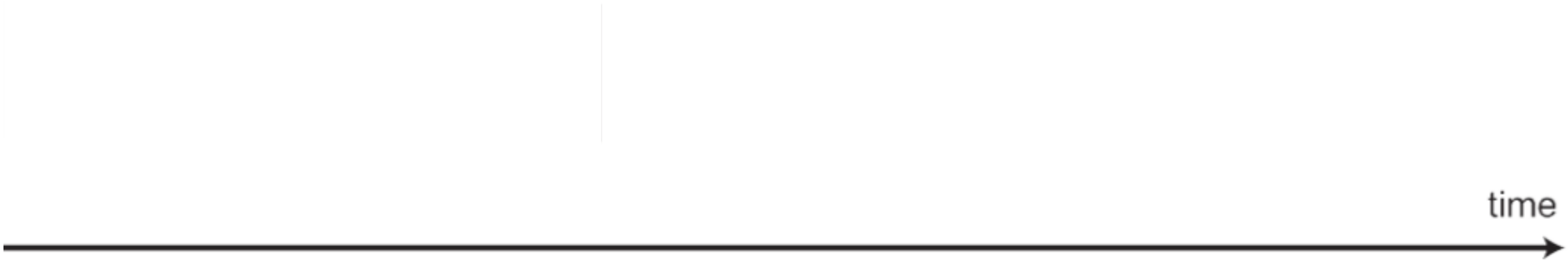

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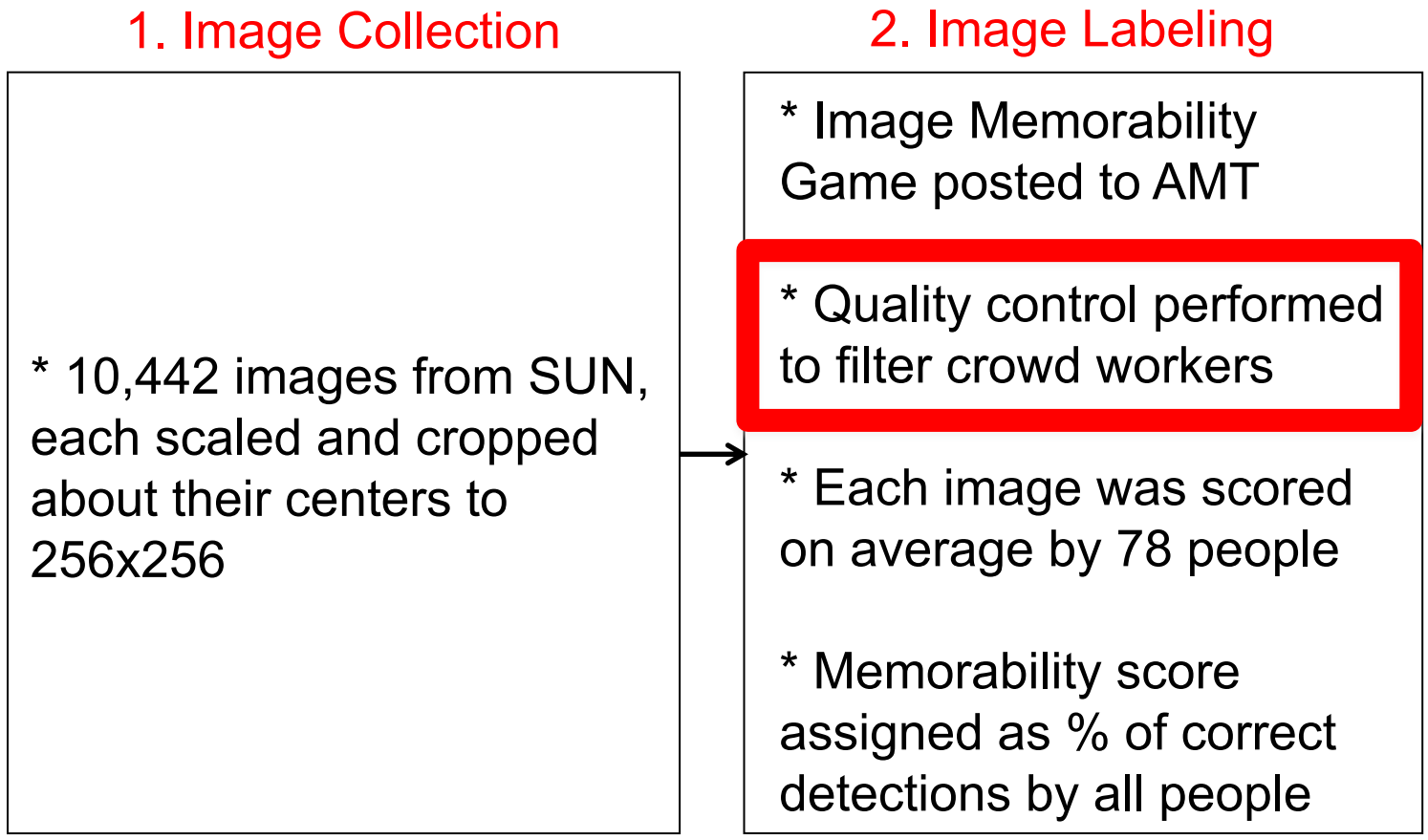


1) Qualification and training demo provided before workers could begin the game

2) Game automatically ended if participant performance fell below pre-defined success thresholds and data discarded

3) Crowd workers were blocked from further contributions when the above happened more than 3 times

Phillip Isola, Jianxiong Xiao, Antonio Torralba, and Aude Oliva. “What Makes an Image Memorable?” CVPR 2011.

Subjective Problem: Image Memorability

- Examples of what the crowd found most/least memorable:

a) Most memorable images (86%)

c) Least memorable images (34%)

Phillip Isola, Jianxiong Xiao, Antonio Torralba, and Aude Oliva. “What Makes an Image Memorable?” CVPR 2011.

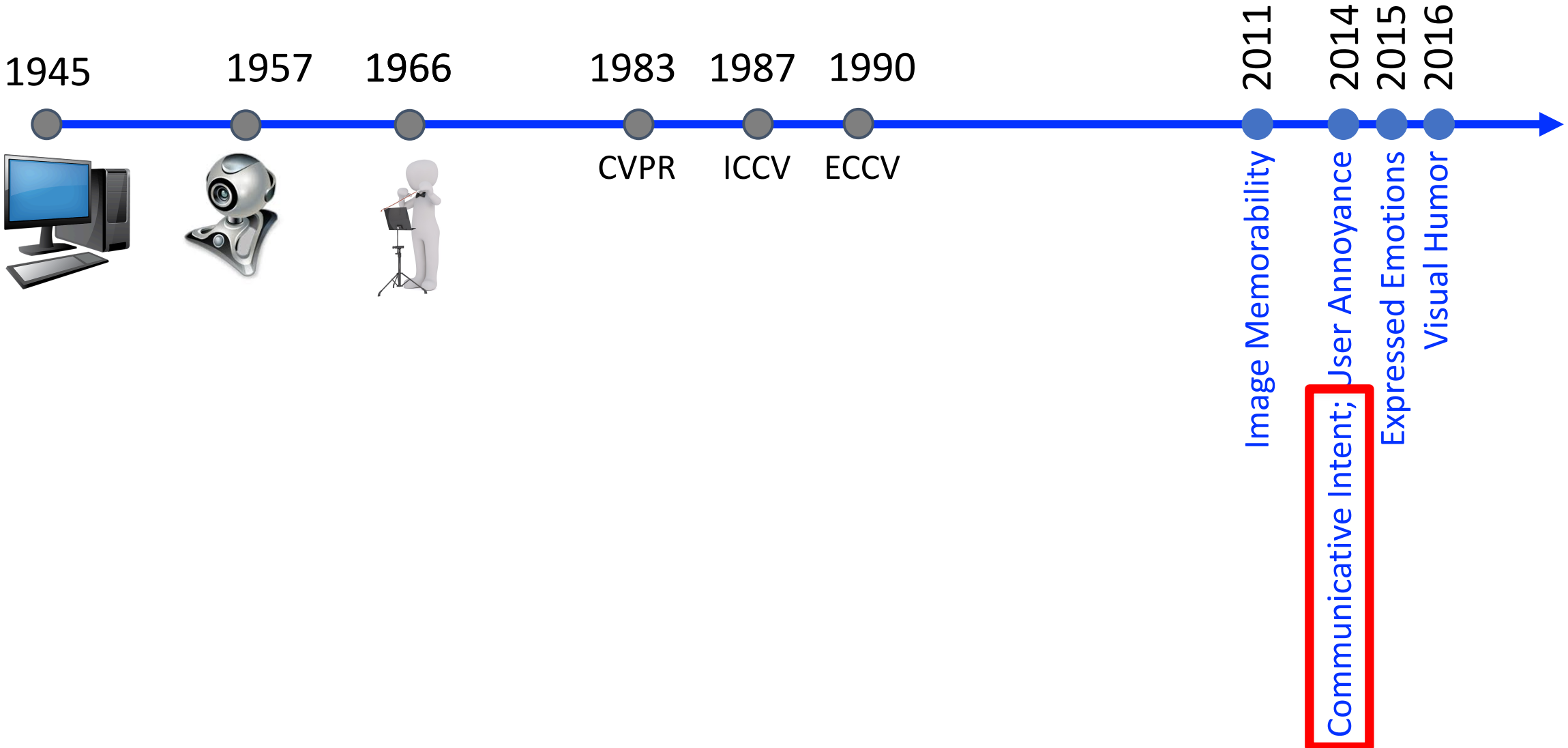
Subjective Problem: Image Memorability

- Work was expanded to predict memorability scores for
  - Scenes [Isola et al; CVPR 2011]
  - Faces [Bainbridge et al; CogSci 2012]
  - Scientific visualizations [Borkin et al; TVCG 2013]

Most Memorable:

Least Memorable:

Subjective Problem Studies



Subjective Problem: Infer Communicative Intents

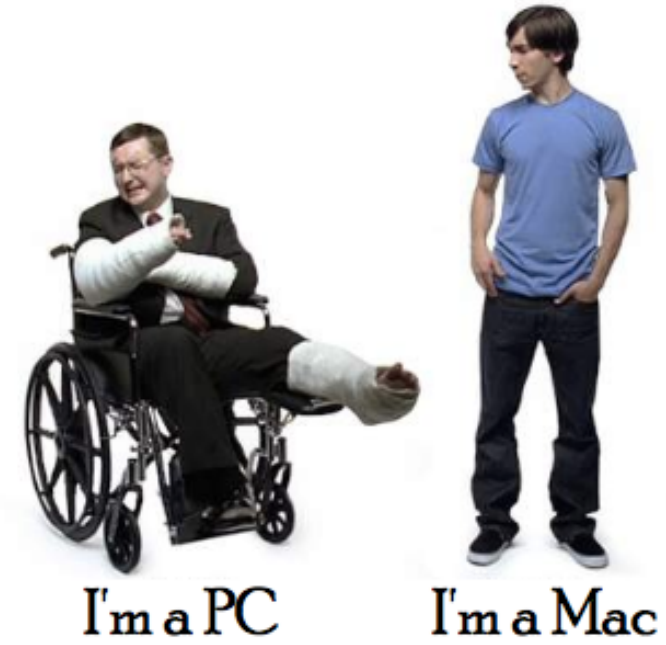
What message does this visualization try to convey?

Obama is an inferior candidate to Romney

Jungseock Joo, Weixin Li, Francis F. Steen, and Song-Chun Zhu. “Visual Persuasion: Inferring Communicative Intents of Images.” CVPR 2014.

Subjective Problem: Infer Communicative Intents

What message does this visualization try to convey?



Mac is more user friendly than a PC

Jungseock Joo, Weixin Li, Francis F. Steen, and Song-Chun Zhu. “Visual Persuasion: Inferring Communicative Intents of Images.” CVPR 2014.

Subjective Problem: Infer Communicative Intents

What message does this visualization try to convey?

Hitler is kind and trustworthy

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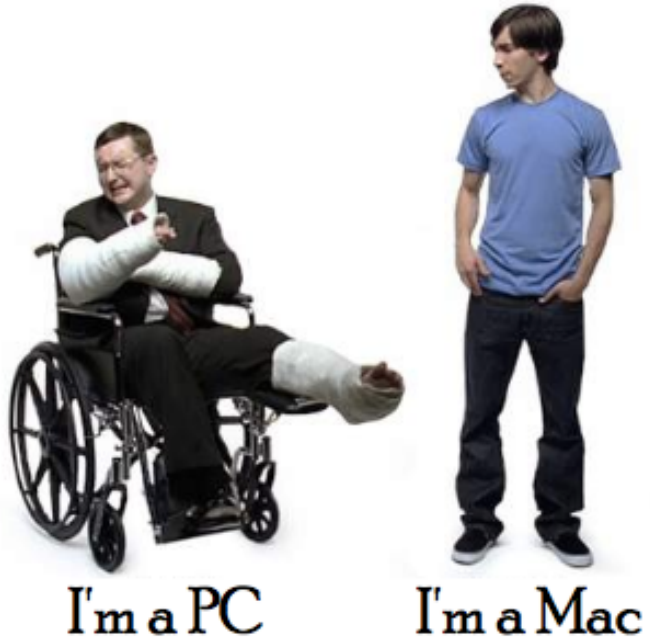
Subjective Problem: Infer Communicative Intents

Can we understand and teach machines to predict the message that an image conveys?



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Subjective Problem: Infer Communicative Intents

1. Category Selection

* 9 dimensions chosen following initial analysis: angry, happy, fearful, competent, energetic, comforting, trustworthy, socially dominant, & overall favorable

Jungseock Joo, Weixin Li, Francis F. Steen, and Song-Chun Zhu. “Visual Persuasion: Inferring Communicative Intents of Images.” CVPR 2014.

Subjective Problem: Infer Communicative Intents

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Subjective Problem: Infer Communicative Intents

Task for each of 9 communicative intents:

e.g., “In which image does [BARACK OBAMA] look more [COMPETENT]”

Global ranking created from all results

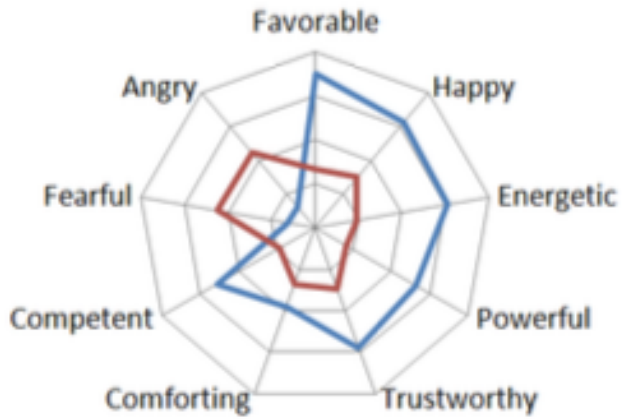
Jungseock Joo, Weixin Li, Francis F. Steen, and Song-Chun Zhu. “Visual Persuasion: Inferring Communicative Intents of Images.” CVPR 2014.

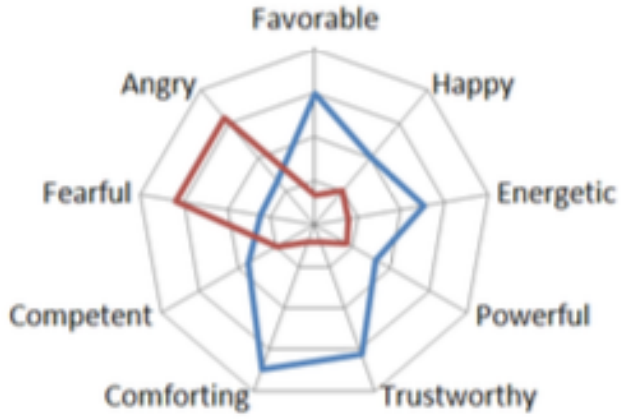
Subjective Problem: Infer Communicative Intents

Least **FAVORABLE**

Least **COMFORTING**

Predicted Intents





Most **FAVORABLE**

Most **COMFORTING**

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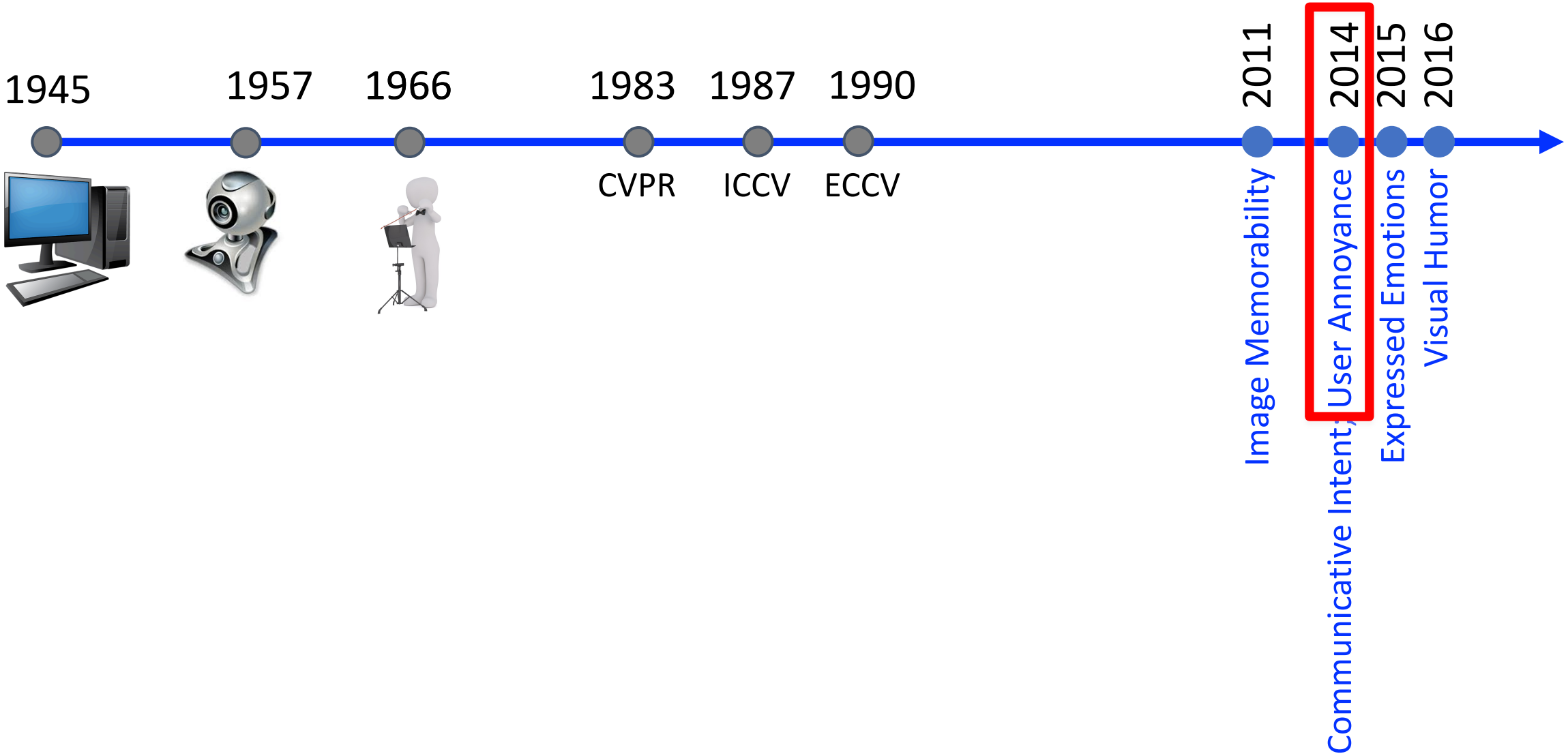
Subjective Problem Studies



Subjective Problem: Predicting User Annoyance

- If you were looking for a picture of A, would you be more annoyed if the search engine returned a picture of B instead, or a picture of C?

A:

Conference Hall

B:

C:

Gordon Christie, Amar Parkash, Ujwal Krothapalli, & Devi Parikh. “Predicting User Annoyance Using Visual Attributes.” CVPR 2014.

Subjective Problem: Predicting User Annoyance

- If you were looking for a picture of A, would you be more annoyed if the search engine returned a picture of B instead, or a picture of C?

A:

A (Miley Cyrus)

B:

C:

Gordon Christie, Amar Parkash, Ujwal Krothapalli, & Devi Parikh. “Predicting User Annoyance Using Visual Attributes.” CVPR 2014.

Subjective Problem: Predicting User Annoyance

- If you were looking for a picture of A, would you be more annoyed if the search engine returned a picture of B instead, or a picture of C?

A:

Mountain

B:

C:

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Subjective Problem: Predicting User Annoyance

1. Image Collection

* 8,523 images from the Public Figures Face database that represents 60 public figures/categories

* 1,600 images from SUN that span 80 categories

2. Image Labeling

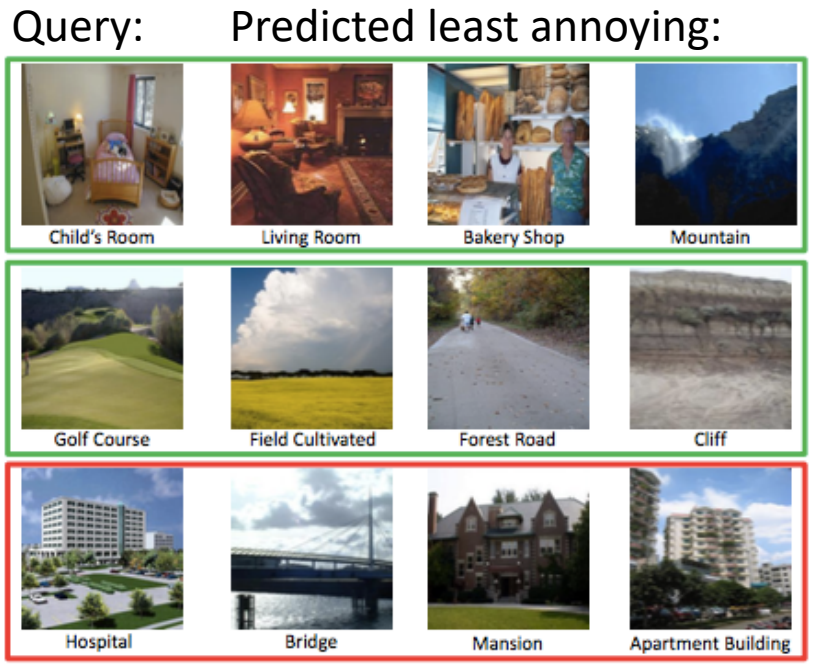
* AMT crowd workers rated on a scale of 1 (not very annoyed) to 5 (very annoyed) how annoyed they would be in searching for images from class B if they were shown images from class A

* Redundant annotations collected for each image (10 for PubFig, 5 for SUN)

Gordon Christie, Amar Parkash, Ujwal Krothapalli, & Devi Parikh. “Predicting User Annoyance Using Visual Attributes.” CVPR 2014.

Subjective Problem: Predicting User Annoyance

- Regressors were trained to predict the annoyance score (average score of crowd votes for both datasets (PubFaces and Scenes)



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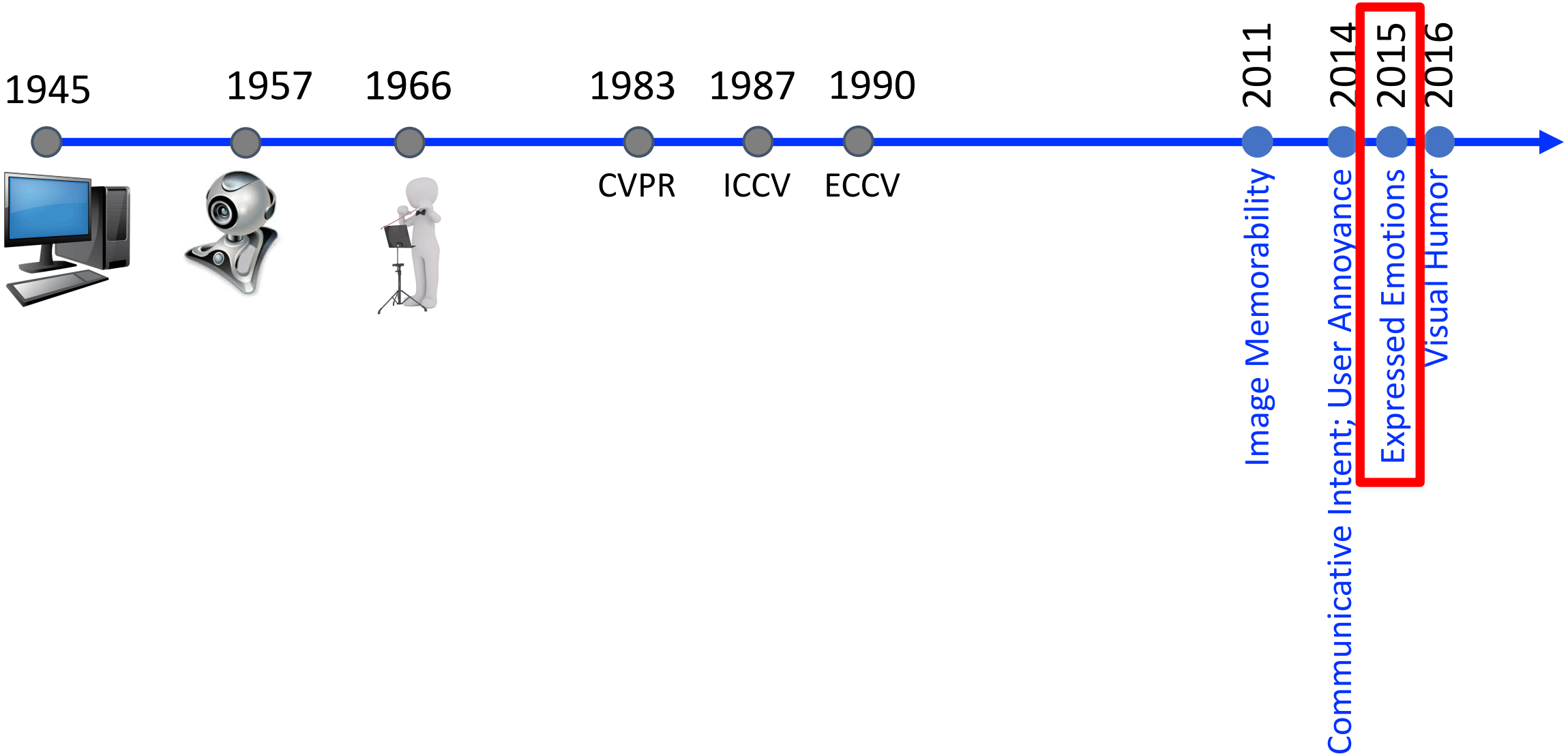
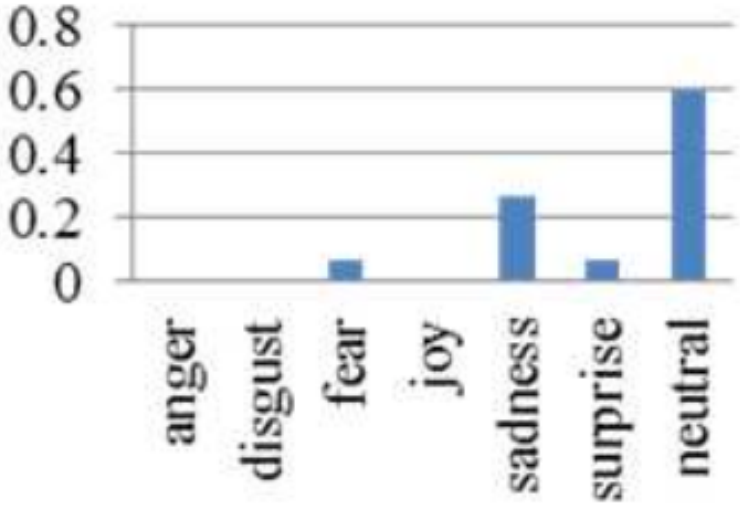
Subjective Problem Studies



Subjective Problem: Emotion Distributions

- Which emotion(s) best describe the expressed emotion of this image?

  - Joy?
  - Sadness?
  - Fear?
  - Disgust?
  - Anger?
  - Surprise?
  - Neutral?



Kuan-Chuan Peng, Tsuhan Chen, Amir Sadovnik, and Andrew Gallagher. “A Mixed Bag of Emotions: Model, Predict, and Transfer Emotion Distributions.” CVPR 2015.

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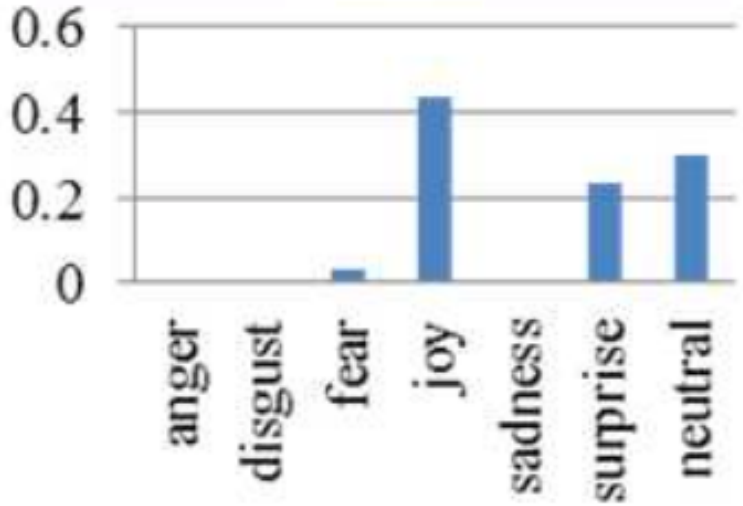

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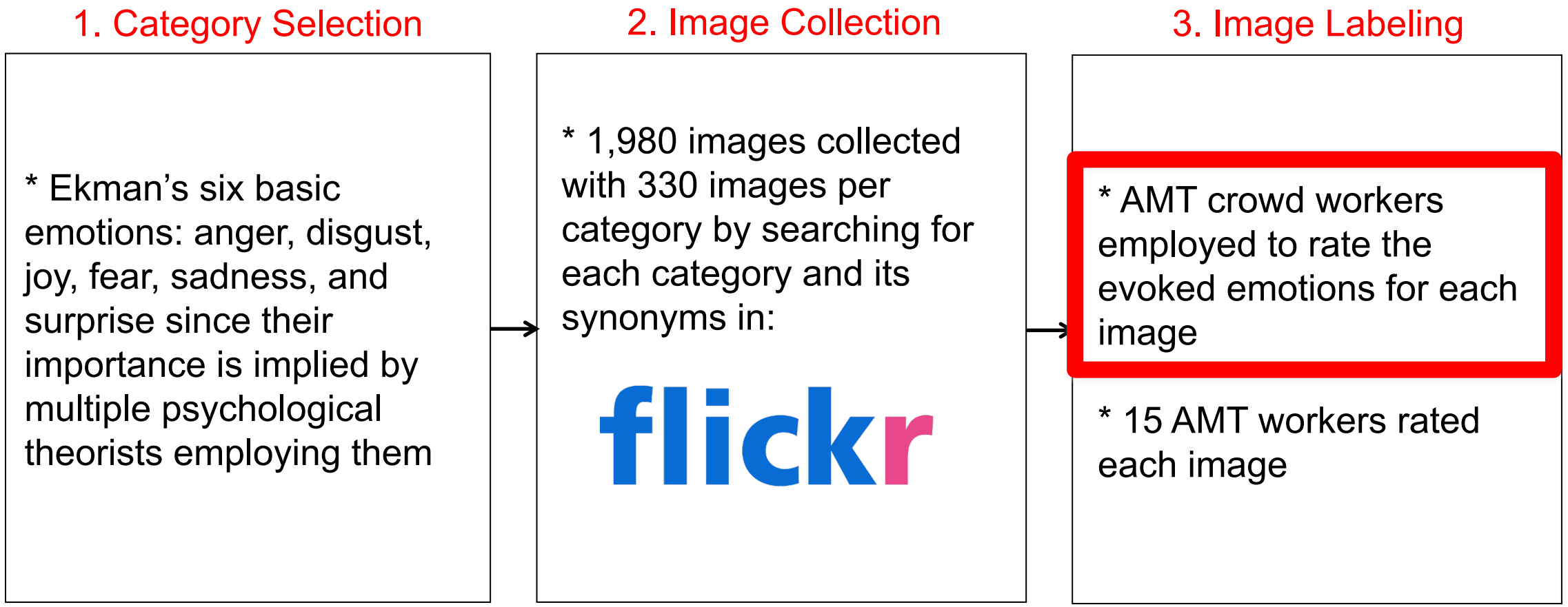
Subjective Problem: Emotion Distributions

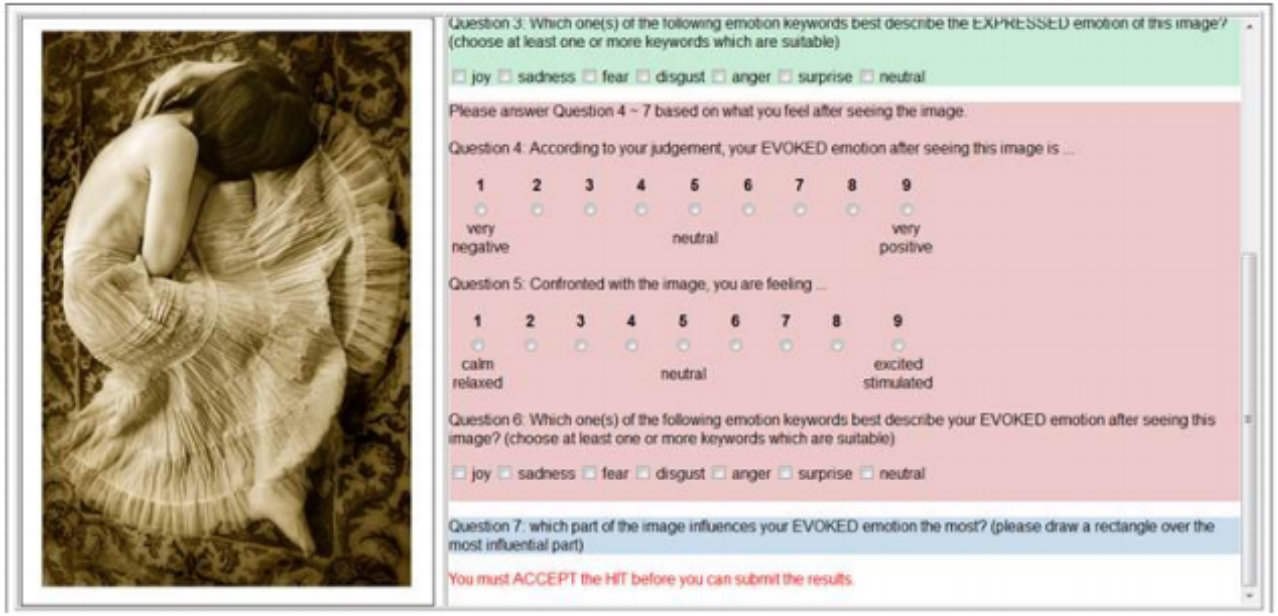


Jungseock Joo, Weixin Li, Francis F. Steen, and Song-Chun Zhu. "Visual Persuasion: Inferring Communicative Intents of Images." CVPR 2014.

Subjective Problem: Emotion Distributions

Instructions:

Task:



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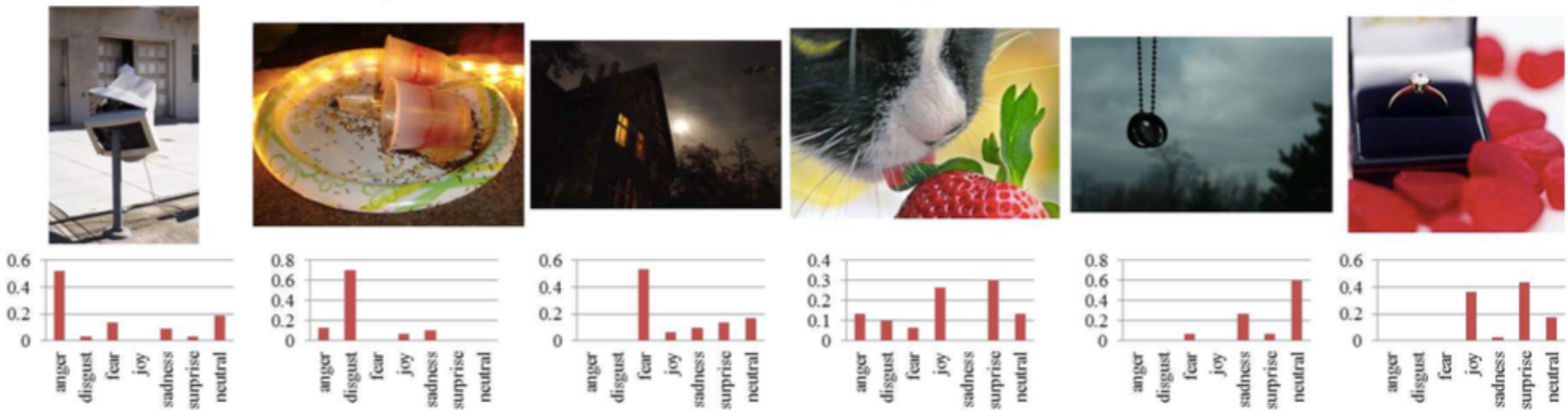
Subjective Problem: Emotion Distributions

- Dataset used to train/test a regressor per emotion and then predict the emotion distribution



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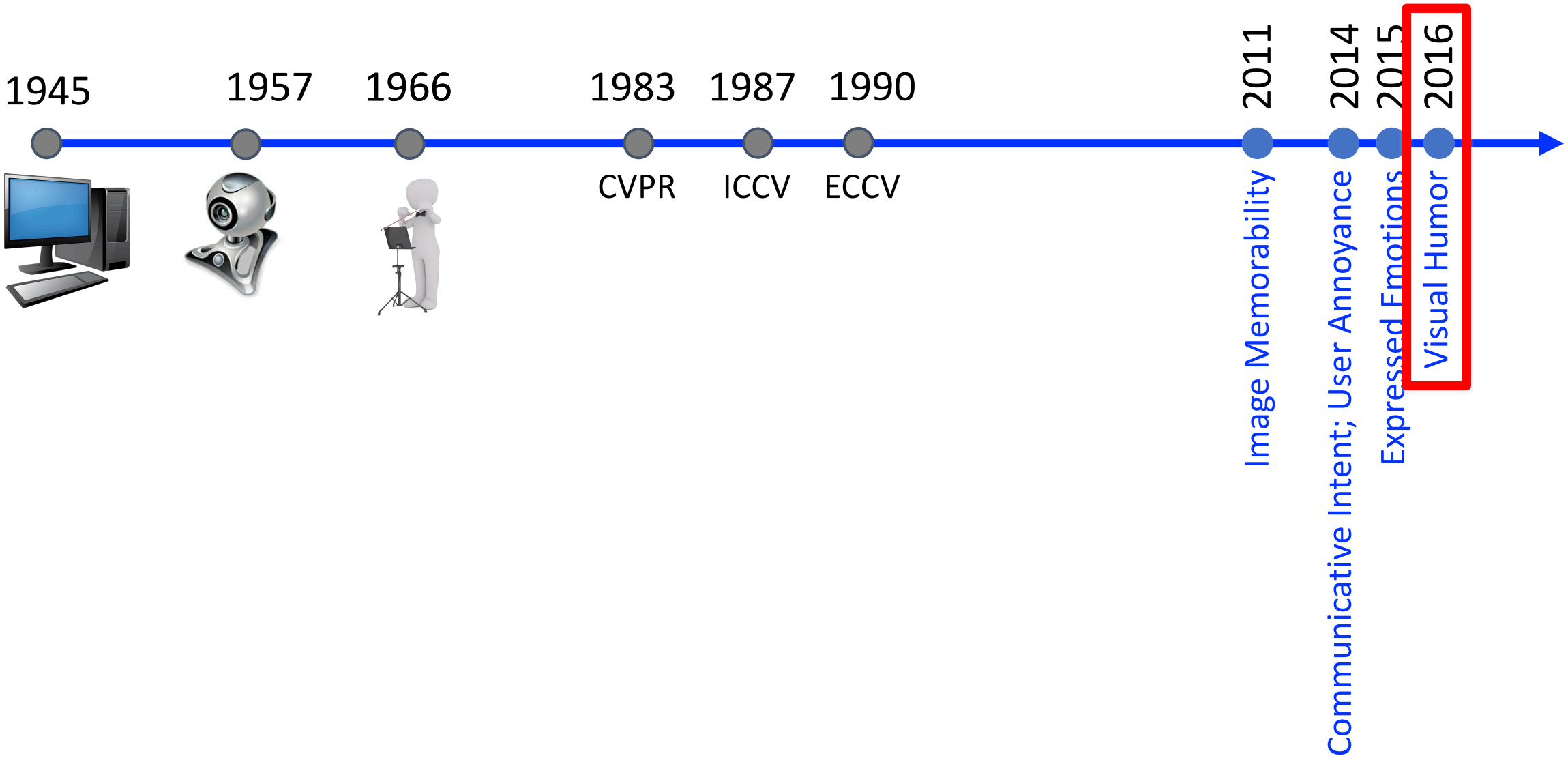
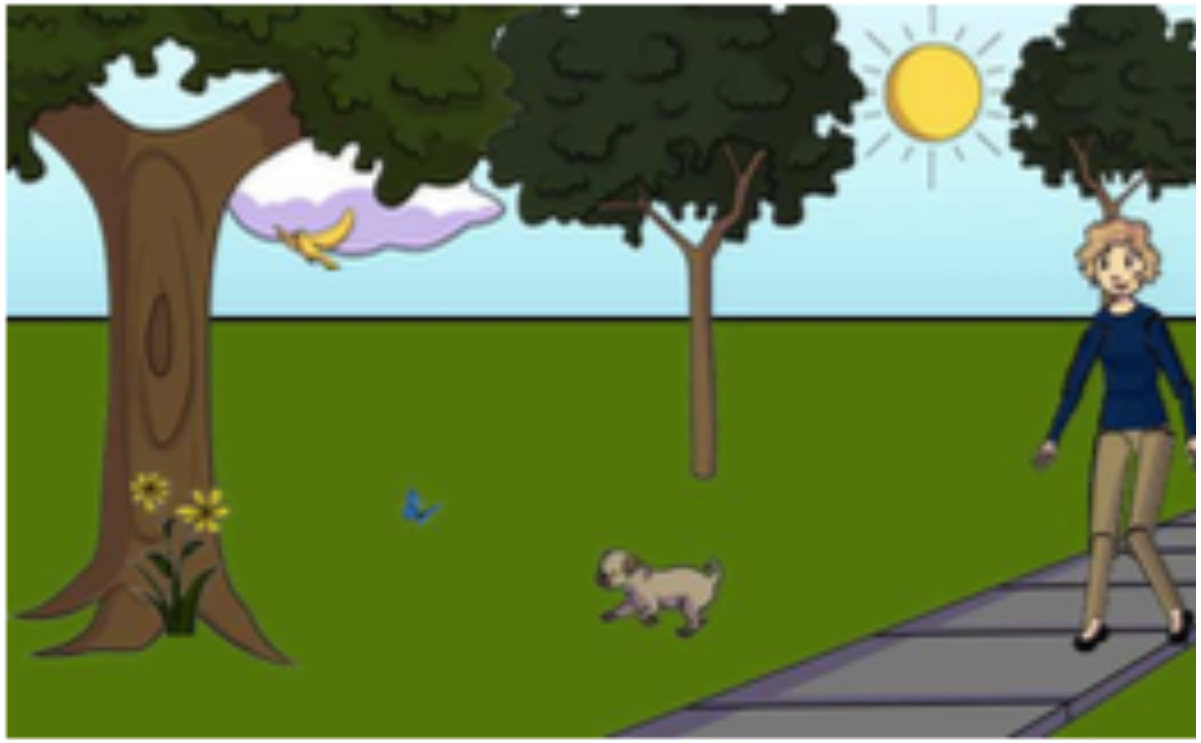
Subjective Problem Studies



Subjective Problem: Visual Humor

- What rating would you give this image on a scale from 1 to 5?

  - 1- not funny
  - 2
  - 3
  - 4
  - 5 - extremely funny



: 0.1

(10 crowd workers)

Arjun Chandrasekaran, Ashwin K. Vijayakumar, Stanislaw Antol, Mohit Bansal, Dhruv Batra, C. Lawrence Zitnick, and Devi Parikh. “We Are Humor Beings: Understanding and Predicting Visual Humor.” CVPR 2016.

Subjective Problem: Visual Humor

- What rating would you give this image on a scale from 1 to 5?

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  - 4
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: 4

(10 crowd workers)

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Subjective Problem: Visual Humor

1. Image Collection

* Crowd workers recruited to create 3,200 “funny” abstract scenes

Arjun Chandrasekaran, Ashwin K. Vijayakumar, Stanislaw Antol, Mohit Bansal, Dhruv Batra, C. Lawrence Zitnick, and Devi Parikh. “We Are Humor Beings: Understanding and Predicting Visual Humor.” CVPR 2016.

Depict Funny Scenarios! (Living/Dining Room)

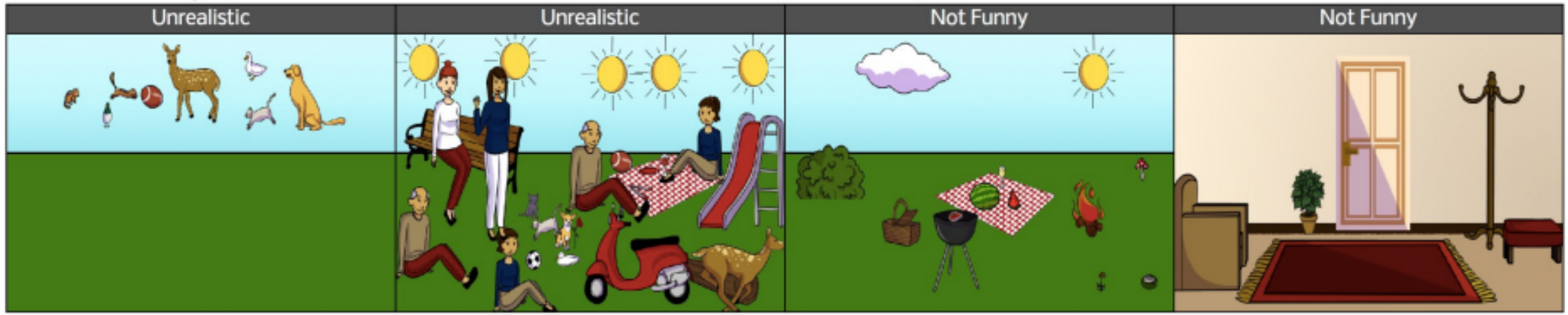
[Images may take some time to load] [Spamming will get blocked]
[Tested with Chrome, Firefox and Safari. Interface may not work well with Internet Explorer]

Using the clipart interface below, please create scenes where a funny scenario is being depicted.

Please follow the **instructions** carefully, otherwise your work **WILL BE REJECTED**.

1. While funny, make your scenarios **realistic** and **meaningful** (e.g., the scene should **not** contain a **random assortment** of clipart pieces).
2. **Other people** should also find your scenario funny (e.g., no inside jokes).
3. Please use **at least 6 pieces** of clipart in the scene.
4. If you do multiple HITs, please be sure to create very **different scenarios** across HITs and not minor variations of a previously created scenario.
5. Give us a **description** of why you think the scenario is funny. Once you create a scene and click next, you will be asked to provide a **description** of what about the scenario is funny.

Below are examples of bad scenarios that are either not realistic or not funny:



Clipart objects (5 instances each) may be added by dragging them onto the scene and removed by dragging them off. They may be resized (CTRL + a/CTRL + z), flipped (CTRL + c), sent backward (CTRL + s) or brought forward (CTRL + x).

You will be asked to complete **2 tasks.**
You can go back and forth between all of your scenarios by pressing "Prev" and "Next". When you finish your last one, a pop-up will ask you to submit the HIT. We'd love to hear any feedback you have about the usability of the interface, any bugs you encounter, or the HIT in general, so feel free to leave a comment.
Thanks for your work!

Scenario 1/2

Prev Next

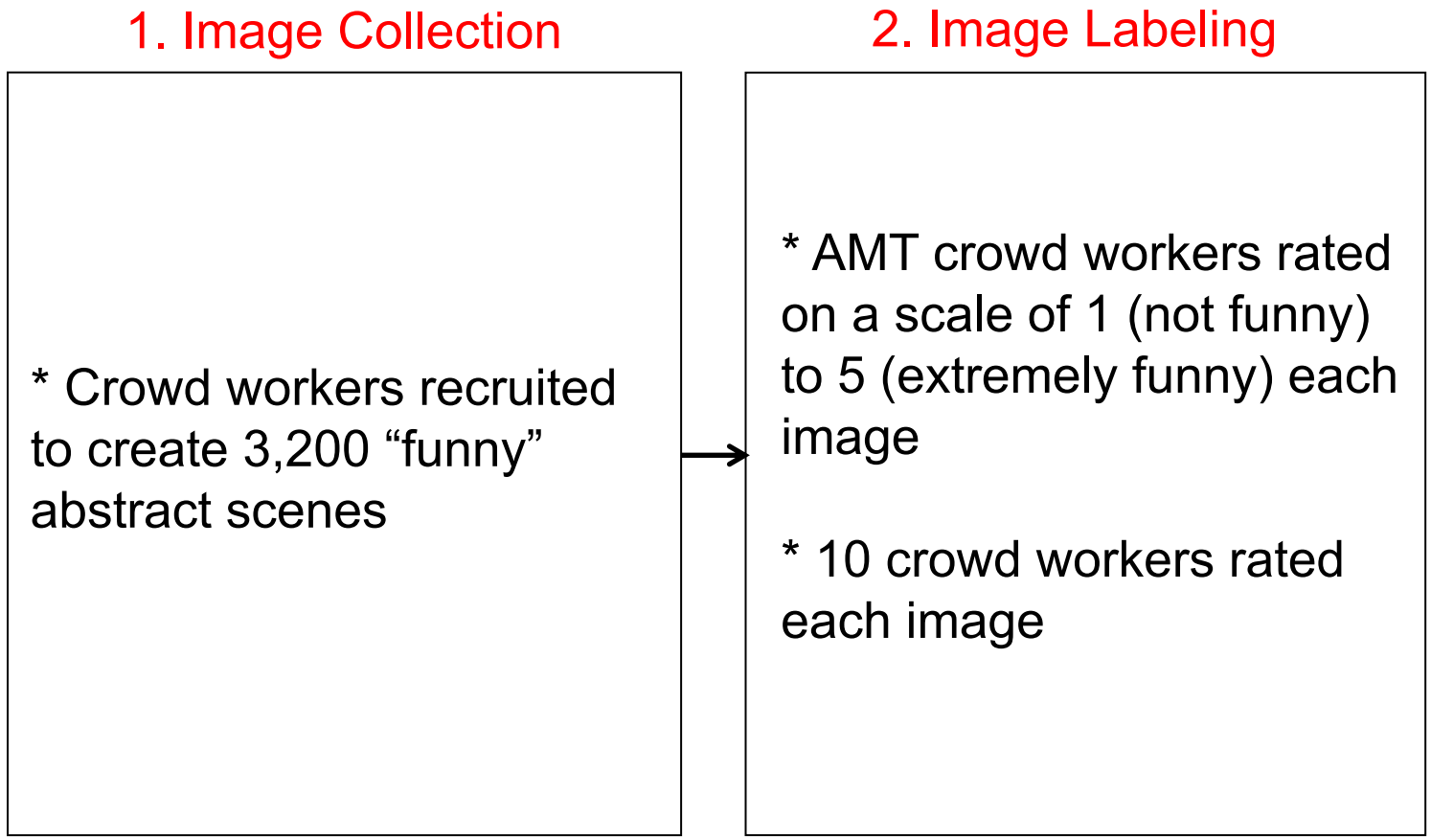
Scene Depth

Flip

Type

People | Animals | Large objects | Small objects

Subjective Problem: Visual Humor



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Subjective Problem: Predicting Visual Humor

- Datasets used to develop a regressor that predicts the funniness score (avg score of 10 crowd votes)

(a) 0.1 (b) 1.5 (c) 4.0 (d) 4.0

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Today's Topics

- Subjective problems and applications with visual data
- Crowdsourcing subjective opinions about visual data
- Class activity: brainstorm, choose, & design future dataset creation
- Lab: final project discussion and open lab

Class Discussion

Beforehand: brainstorm 1 idea for a subjective task you would like to develop an AI algorithm to be able to do and submit to a Google form

1. [7 minutes] Each group must choose 1 idea from the list
2. [15 minutes] Then, each group must:
    a. Create a plan for how you will create a dataset with 100,000 labeled examples using crowdsourcing
    b. Estimate the budget for this project
3. Then, each group will present their final plan to the class
4. Each person in the class will get to allocate $50,000 to preferred projects
5. We will tally the allocated money to identify which projects are best-funded

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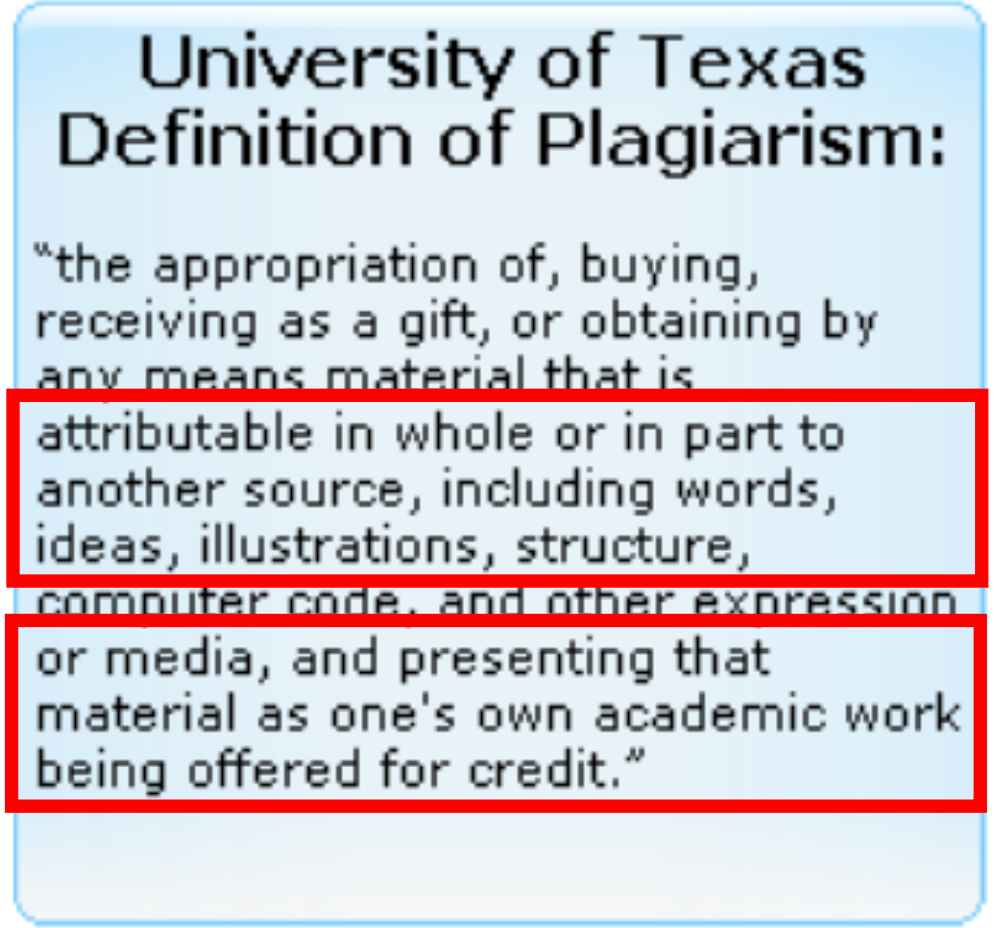
Final Project Paper: Writing Support

- Writing center: http://uwc.utexas.edu/
  - can schedule four individual 45-minutes consultation per month

- Tutoring:
  - https://utdirect.utexas.edu/apps/ugs/my/tutoring/student/tutoring-agreement/

Final Project Paper: Plagiarism

- Material from: https://legacy.lib.utexas.edu/services/instruction/avoidplagiarism.html



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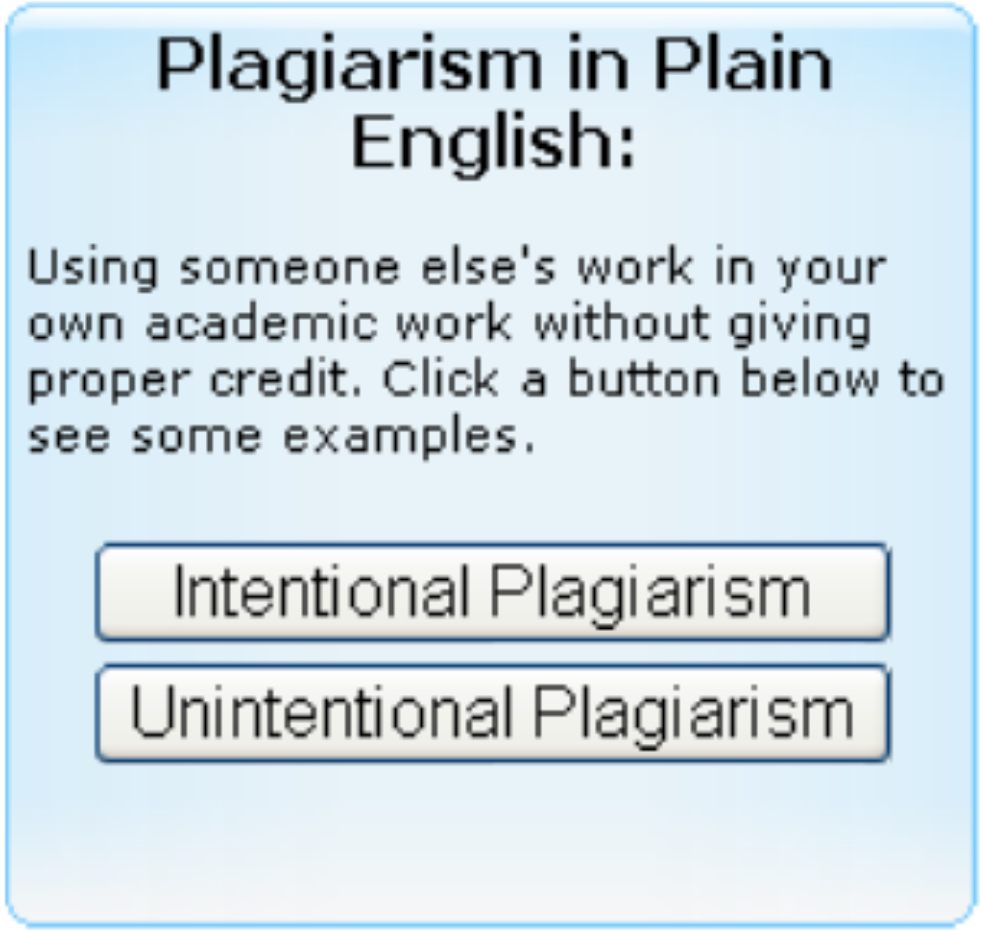

Final Project Paper: Plagiarism - Play It Safe, Give Credit Generously

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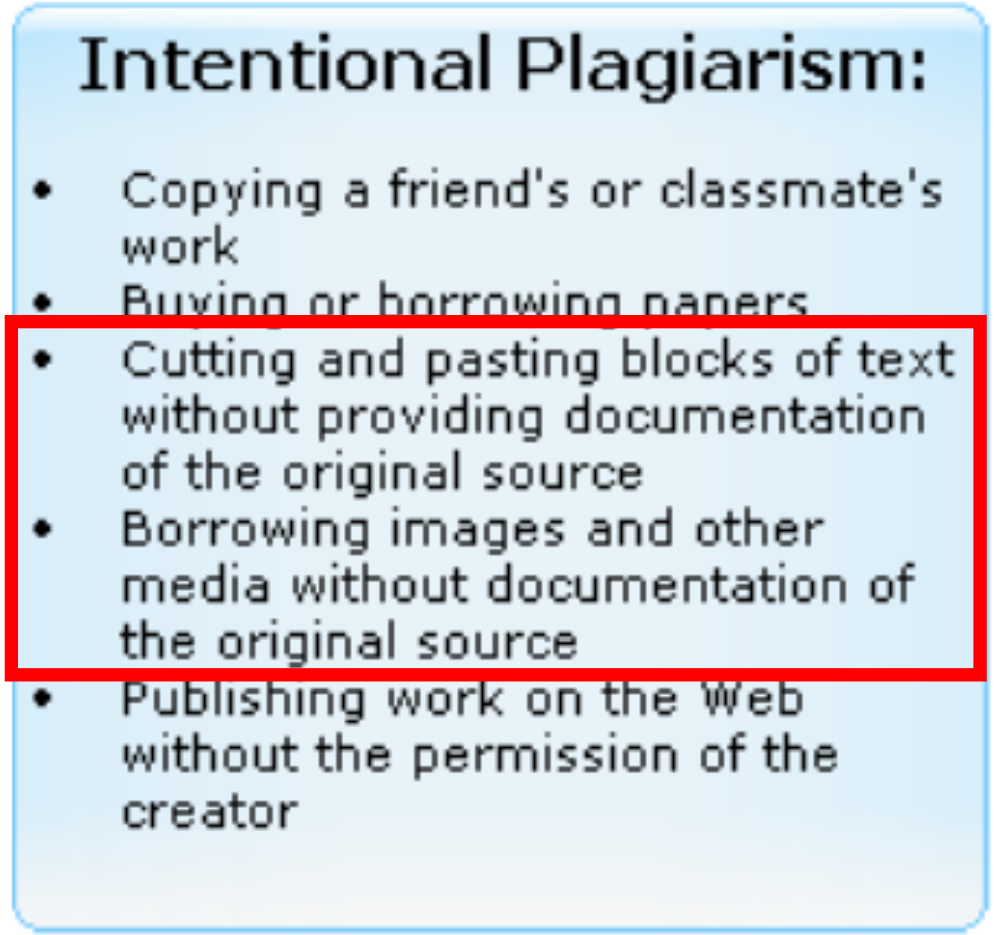

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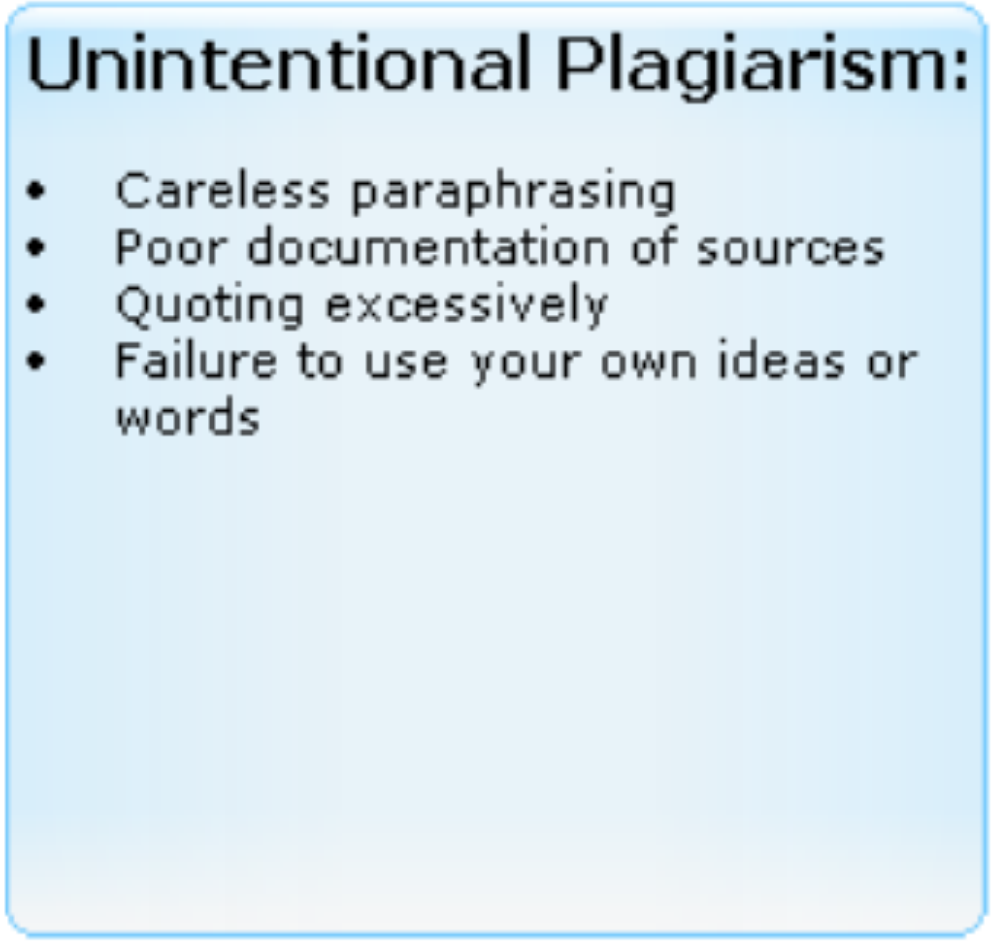

Final Project Paper: Plagiarism - Play It Safe, Give Credit Generously

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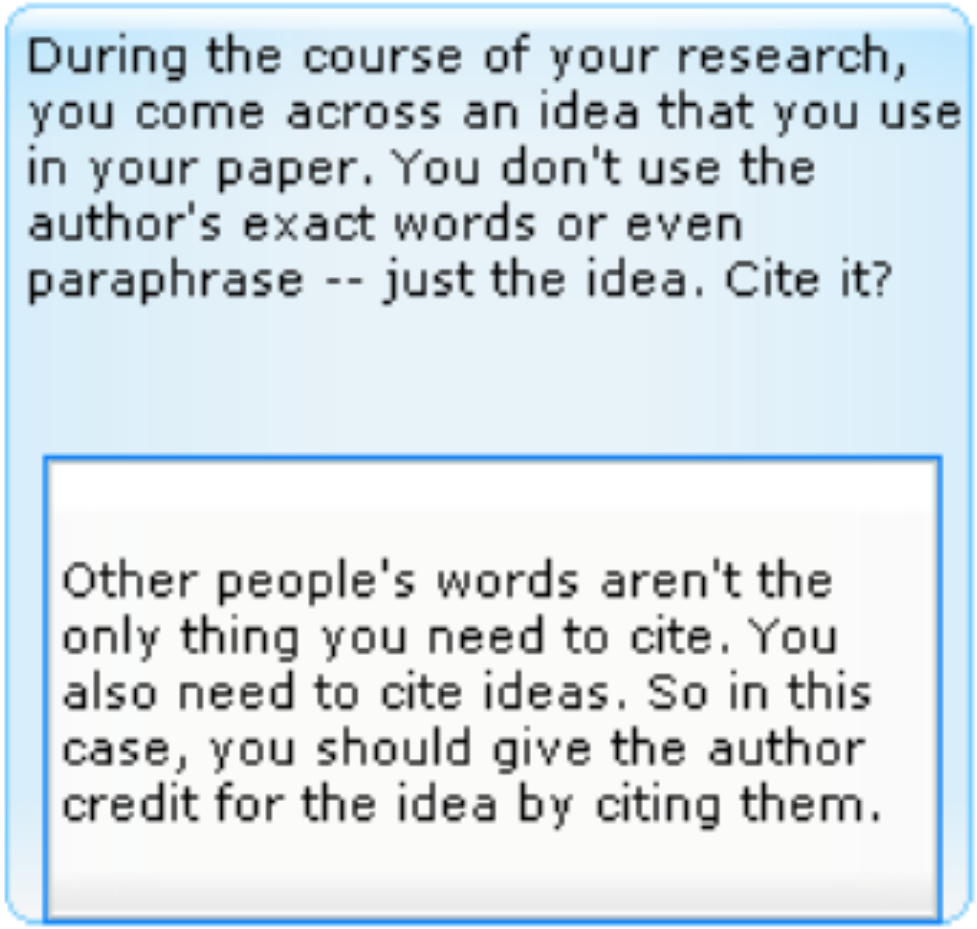

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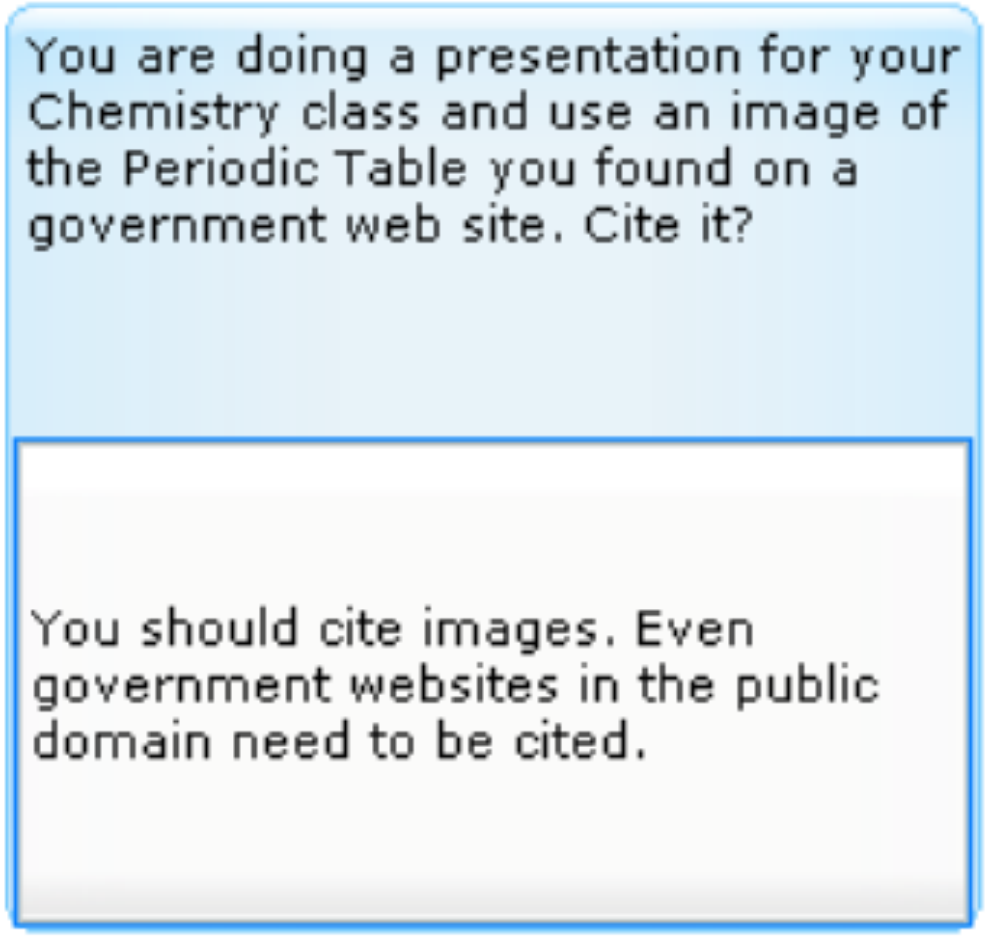

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- What can happen if you are accused of plagiarism?
  - Redo assignment
  - Receive a failing grade
  - Be suspended
  - Be expelled

- What resources can help you to avoid plagiarism?
  - Review: https://legacy.lib.utexas.edu/services/instruction/avoidplagiarism.html
  - Review: https://legacy.lib.utexas.edu/d7/sites/default/files/services/instruction/AvoidingPlagiarism_guide.pdf
  - Visit writing center: http://uwc.utexas.edu/

- Neither you (I believe) nor I have any desire to talk about plagiarism ☺
- Play it safe and give credit generously!!!

Final Project Paper: Writing Support

- Writing center: http://uwc.utexas.edu/
  - can schedule four individual 45-minutes consultation per month

- Tutoring:
  - https://utdirect.utexas.edu/apps/ugs/my/tutoring/student/tutoring-agreement/

Final Project Video

- Video creation/editing resources:
  - https://docs.google.com/document/d/1y1AENPLDGi4N1oUmd7g4Z4id_ih31HwUOmrM1jy2Gjg/edit

- Attributions:
  - Creative commons license generator: https://creativecommons.org/choose/

Give Credit Generously

- Idea: add credit page to your presentation for resources used
  - e.g., Microsoft Azure
  - e.g., freely-shared code/libraries
  - e.g., links to all images
  - …