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|  | **Computer Vision** |  |

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## For the following activities you will be using the Microsoft Azure Machine Learning Platform, Google’s computer Vision, and Neural Network-based Automatic Image Colorization research project funded by JST CREST.

Microsoft Azure [Face](https://azure.microsoft.com/en-us/services/cognitive-services/face/?v=18.05)

With the people sitting next to you, take a picture of the group.

Upload that picture to the Face Detection area.

* For each member of the group record the machine learning algorithms prediction of age, emotion, gender, and hair color. Put a star next to every correct guess and an X by each incorrect guess.

Person #1 Person #2 Person #3

Age 11 X 48 X 46 X

Gender Female \* Male \* Female \*

Hair Color Blond \* Brown \* Blond \*

Emotion Happy \* Happy \* Happy \*

* Based on the numbers in the JSON fields, what do you think are important fields that the algorithm looks for in assigning gender?

I think that long hair and makeup are two of the most important characteristics when categorizing females and short hair and facial hair are the two for males.

* Based on the numbers in the JSON fields, what do you think are important fields that the algorithm looks for in assigning age?

Amount of wrinkles, hair color

Microsoft Azure [Computer Vision](https://azure.microsoft.com/en-us/services/cognitive-services/computer-vision/?v=18.05)

Find an image with many different subjects and things happening.

Plug that image into the Analyze an image section.

* Paste the description from the JSON and the picture into this worksheet here.

{ "tags": [ "person", "road", "outdoor", "people", "crowd", "street", "large", "group", "riding", "crossing", "holding", "walking", "cross", "traffic", "man", "track", "many", "board", "snow", "city", "skiing", "standing" ], "captions": [ { "text": "a group of people crossing a street in front of a crowd", "confidence": 0.932173 } ] }



[Google Cloud Vision](https://cloud.google.com/vision/)

Use the same image you used for the Microsoft Azure Computer Vision.

* What differences do you notice between Microsoft and Google Vision?

Microsoft identified several different things, not just the people as Google did.

* If you were a company spokesperson choosing between these two platforms, which would you choose to advise you corperation to use and why?

Depending on the use I would most likely go for Microsoft for details and grand ideas with Google for more specific limited subjects.

* What are some practical uses for this software? List at least five with one sentence each.

This software can be used for identifying people. This software can be used for the disabled that can’t see and can be used to describe the image. This software can be used for quick identification and classification of images. This software can be used for security systems. This software can be used for photo taking.

* [Microsoft Azure Ink Recognizer](https://azure.microsoft.com/en-us/services/cognitive-services/ink-recognizer/#features) Try to stump the text recognition software. If you are successful, what confuses the machine learning algorithm? If not, what did you try to do to confuse the algorithm?

I did a signature that confused it as I did it fast and sloppy like my parents’.

* For the Recognize celebrities and landmarks section, plug in a picture of any mainstream celebrity that you can find on the internet. Did it figure out who the person is?

Yes it recognized Rihanna.

* Try a picture of yourself. Did it recognize you as a celebrity? What did it name the picture and what was the confidence of the algorithm in the JSON?

No. I was unknown.

## How does this work?

[Project](http://iizuka.cs.tsukuba.ac.jp/projects/colorization/en/)

Demo :[Neural Network-based Automatic Image Colorization](http://iizuka.cs.tsukuba.ac.jp/projects/colorization/web/) [Image Colorization #2](https://deepai.org/machine-learning-model/colorizer)

Go to the link above and insert four pictures from a Google search for black and white images.

Paste the results below under each number.

1. A macaw
2. A tiger
3. An eye
4. A historic image of your choosing (Must be a photo not a graphic.)

* What assumptions of color did the network make? There are multiple colors of each of the first three images. Why did the network choose what it chose to display?

It chose to display a grey toned macaw as it didn’t know what color it was. This was the same for all other images except for the historical image which I did MLK and it got that right.

* The neural network that this application runs on needed to be trained to do what it does. What do you believe that the training data for this neural network included?

I think it included easy one color pictures of items as it can have a better percentage correct.

* Bias and ethics: What problems do you foresee that could be ethical issues that this network could have gotten wrong? List at least three problems based on what you know about neural networks so far and generalizations the network needs to make by definition.

If you show it to a person that is not necessarily caucasion or its as famous, the network is more likely to mess these up. I know that in most training with these networks, they use caucasions, but they tend to forget about the other ethnicities. Another problem is with pictures that can be several different colors. When I plugged in a rainbow it just showed me in grey scale as it didn’t recognize what I was showing it. This is a perfect example of the many different colors. Another problem is the fact that most neural networks run on stereotypes such as females have long hair and men have facial hair. This is a big ethical problem as these networks cannot accurately classify and identify diversity in anything.