ARTIFICE - AI workshop

Data, Algorithm & Computation, Creativity

Janet Huang

2023.10.11

Objectives of this AI workshop

- Understand how to turn your idea into practice
  - Understand how to use tools for supporting consolidating your idea
  - Understand how to use tools/libraries/algorithms for supporting prototyping with data and AI
- Build an AI (i.e., an image/audio/pose classifier) based on **your own data**
- Build an AI (i.e., an object detector) with **a pre-trained model** to recognize 80 everyday objects
- Design/build an entire system, as **a blueprint**, for realizing your project idea

Workshop Structure

- **Session 0**: Reflect on your mini assignment **(15 mins)**
  - build an image classifier using Teachable Machine
- **Session I:** Design your AI agents **(25 mins)**
  - MS-COCO dataset
  - thingCV tool
  - exercise 1: design your agent with AI canvas
- **Session II:** Build your own thingCV
  - introduction to p5.js, ml5.js and Data Foundry **(10 mins)**
  - exercise 2: object detector (data foundry, p5.js, ml5.js) **(30 mins)**
  - exercise 3: store your data in DF (data foundry, IoT dataset) **(20 mins)**
  - exercise 4: data visualization (d3.js, data foundry) **(20 mins)**
- **Recap**

Session 0: Teachable Machine

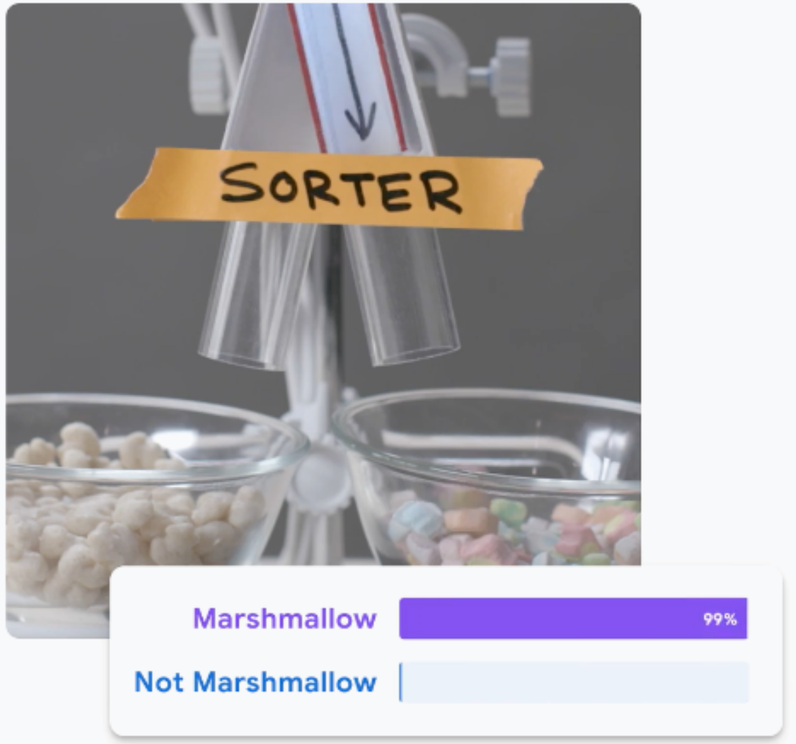
About FAQ Get Started

Teachable Machine

Train a computer to recognize your own images, sounds, & poses.

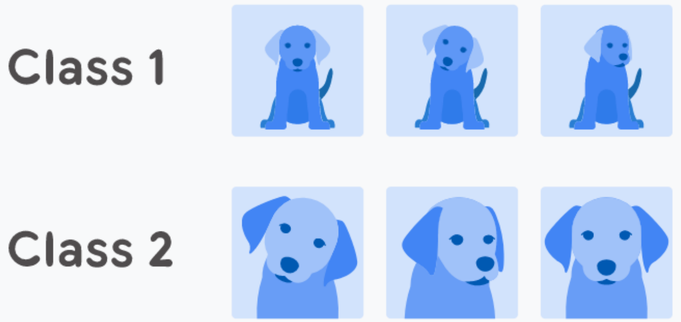
A fast, easy way to create machine learning models for your sites, apps, and more – no expertise or coding required.

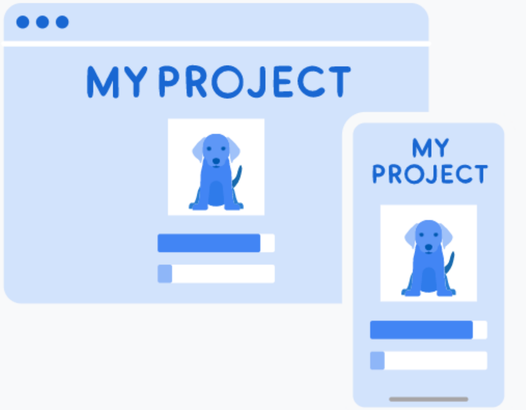
Get Started



https://teachablemachine.withgoogle.com

Teachable Machine





1 Gather

Gather and group your examples into classes, or categories, that you want the computer to learn.

2 Train

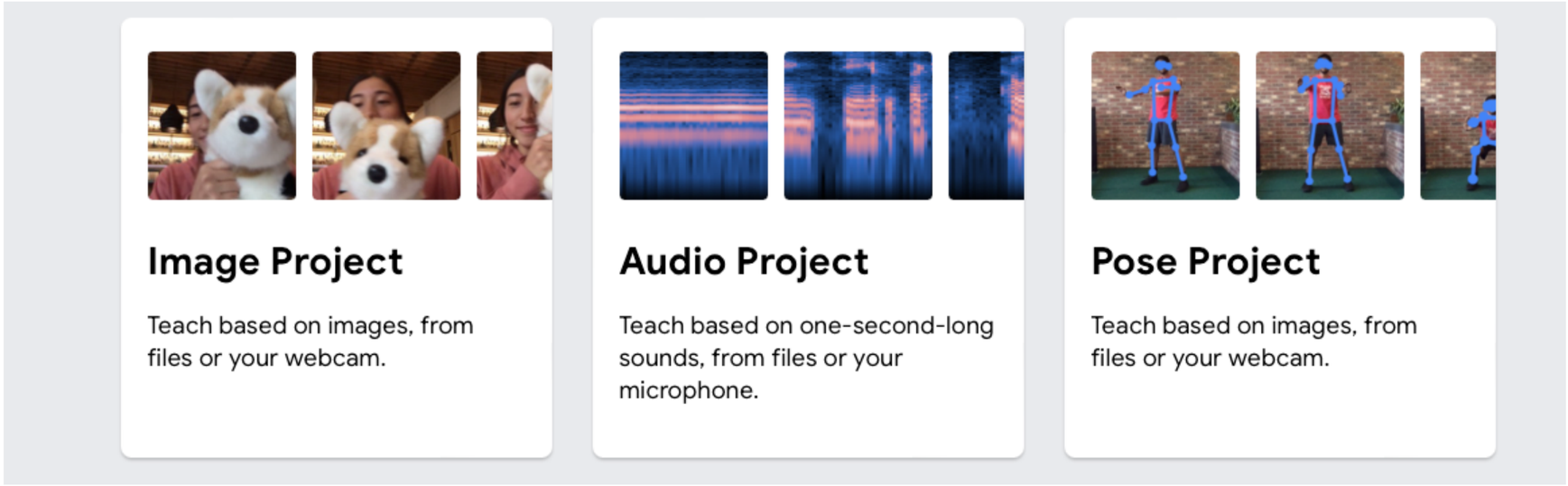
Train your model, then instantly test it out to see whether it can correctly classify new examples.

3 Export

Export your model for your projects: sites, apps, and more. You can download your model or host it online for free.

Warm-up Exercise: (5 mins)

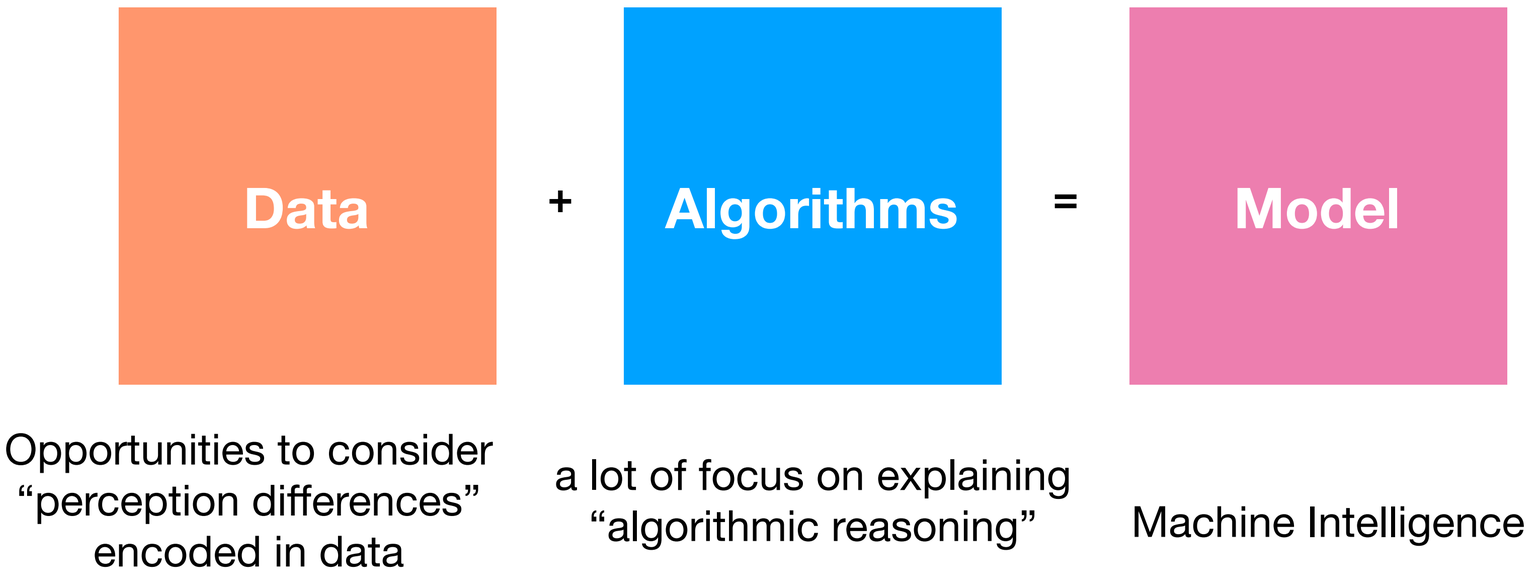
Play with the model trained from your peers



Share your reflection with us!

AI: What is inside?

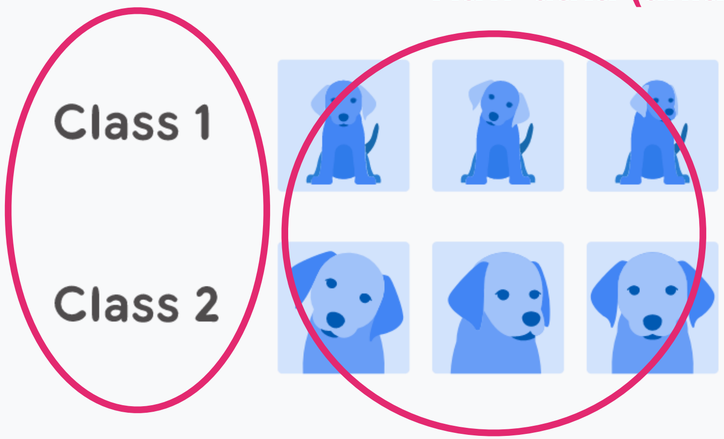
- Data
  - raw data vs labels (i.e., human annotation)
- Feature
- Parameters
- Algorithms
- Model



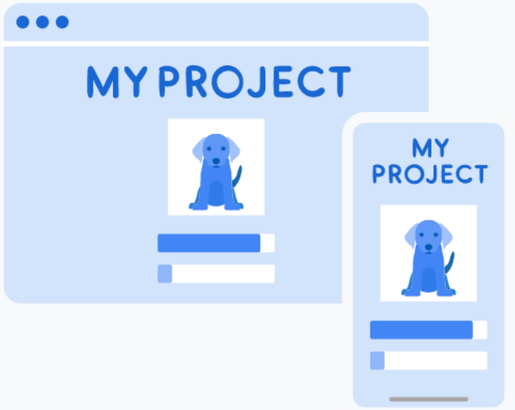
Teachable Machine

(class) labels

Raw data (unlabeled data)



(image, audio, or pose) classifier



1 Gather

Gather and group your examples into classes, or categories, that you want the computer to learn.

2 Train

Train your model, then instantly test it out to see whether it can correctly classify new examples.

3 Export

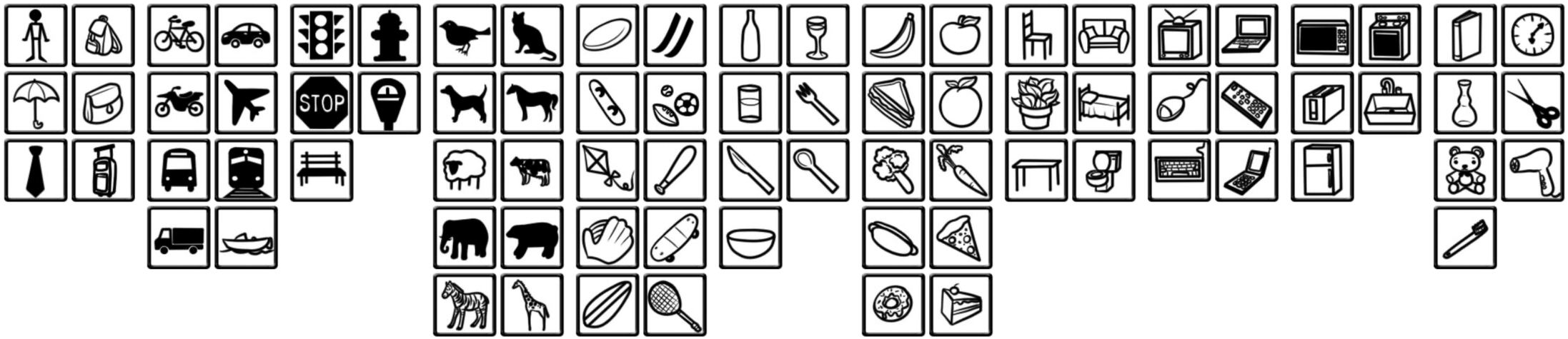
Export your model for your projects: sites, apps, and more. You can download your model or host it online for free.

algorithm: “transfer learning”

Session I: Design your AI agents

Task: Design Your AI Agents

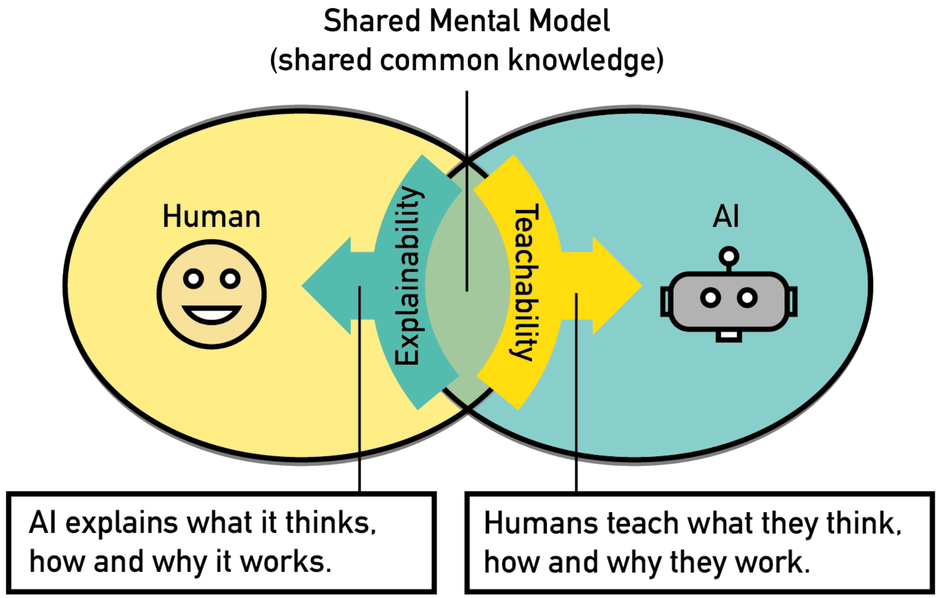
Pickup one object and redesign it as an AI agent in a IoT ecosystem



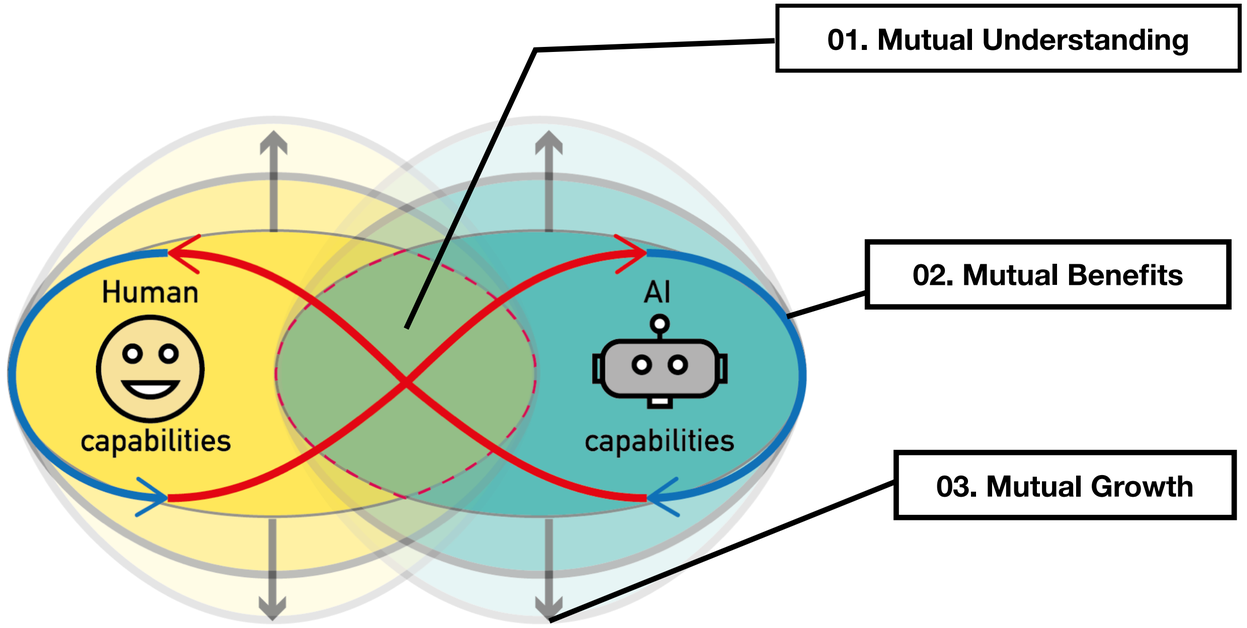
Prompt: Illustration of a designer with a worry face, surrounded by crumpled design sketches, symbolizing his confusion and uncertainty about his work. Created by DALL-E 3

Prompt: Illustration of a female designer with a concerned expression, holding her head in her hands, amidst a chaotic workspace filled with design drafts and tools. Created by DALL-E 3

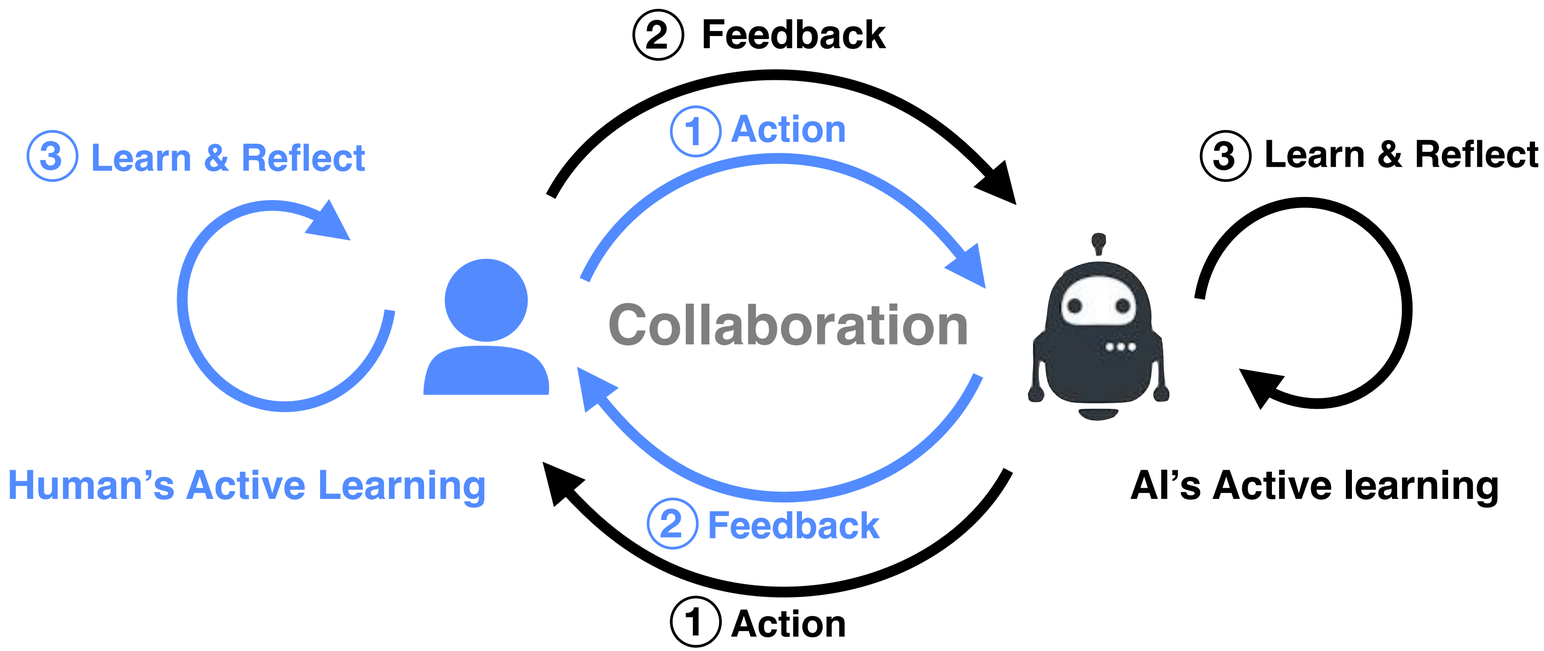
Human-AI Interaction



Human-AI Co-Learning

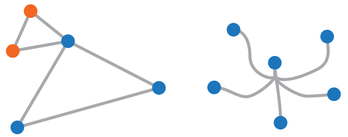


Human-AI Collaboration Framework

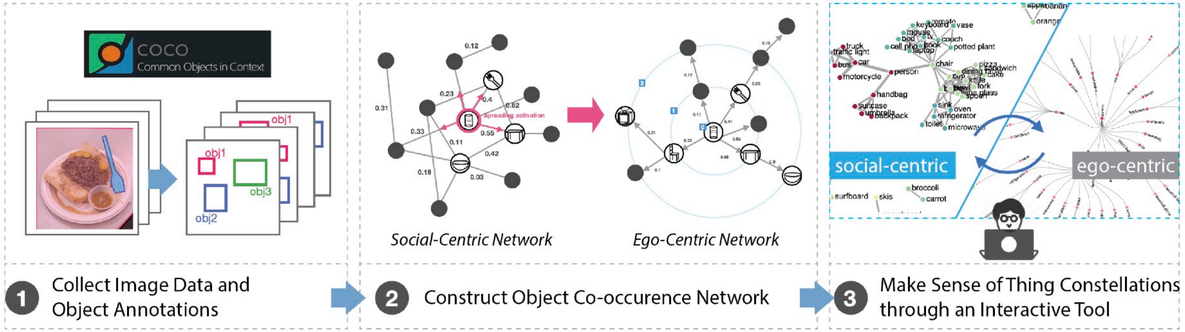


Thing Constellation Visualizer

Exploring Emergent Relationships of Everyday Objects



Data-Driven Design Exploration



Data-driven pattern + Human interpretation

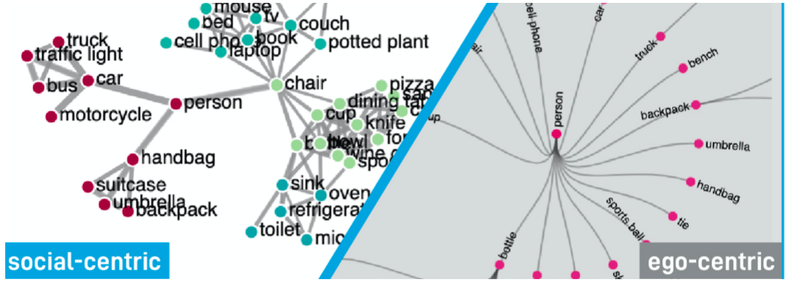
Contributions

This work presents Thing Constellation Visualizer (ThingCV), **a new approach and tool** that **empowers** designers to **use alternative perspectives to revisit everyday practice** and contributes **new insights** from two workshops on **in-depth understandings of emergent relationships among objects.**

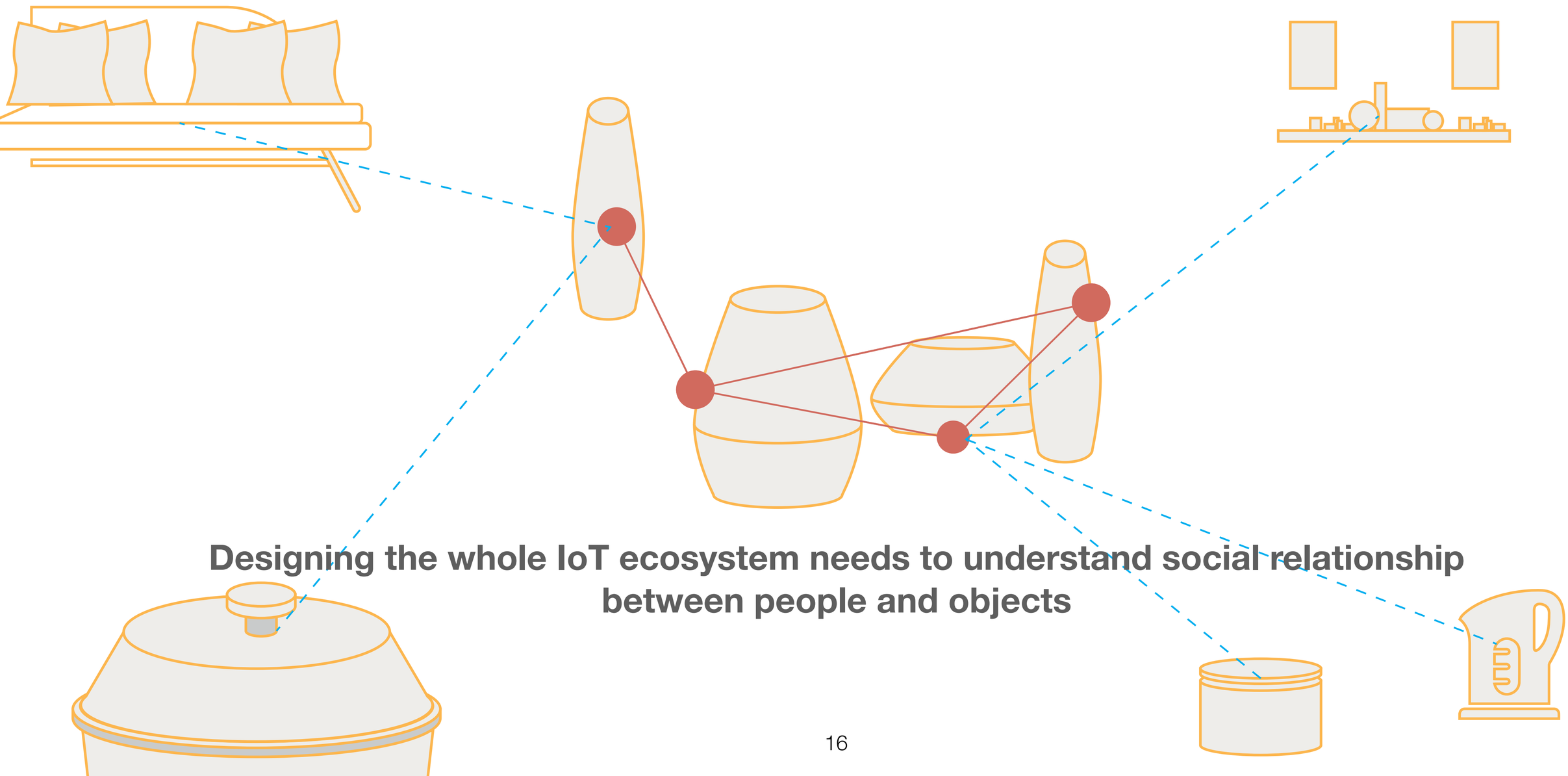
The approach, tool, and insights will contribute to **the future design of IoT ecosystems.**

Janet Huang
TU Eindhoven
TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

thingCV (https://thingconstellation.github.io)

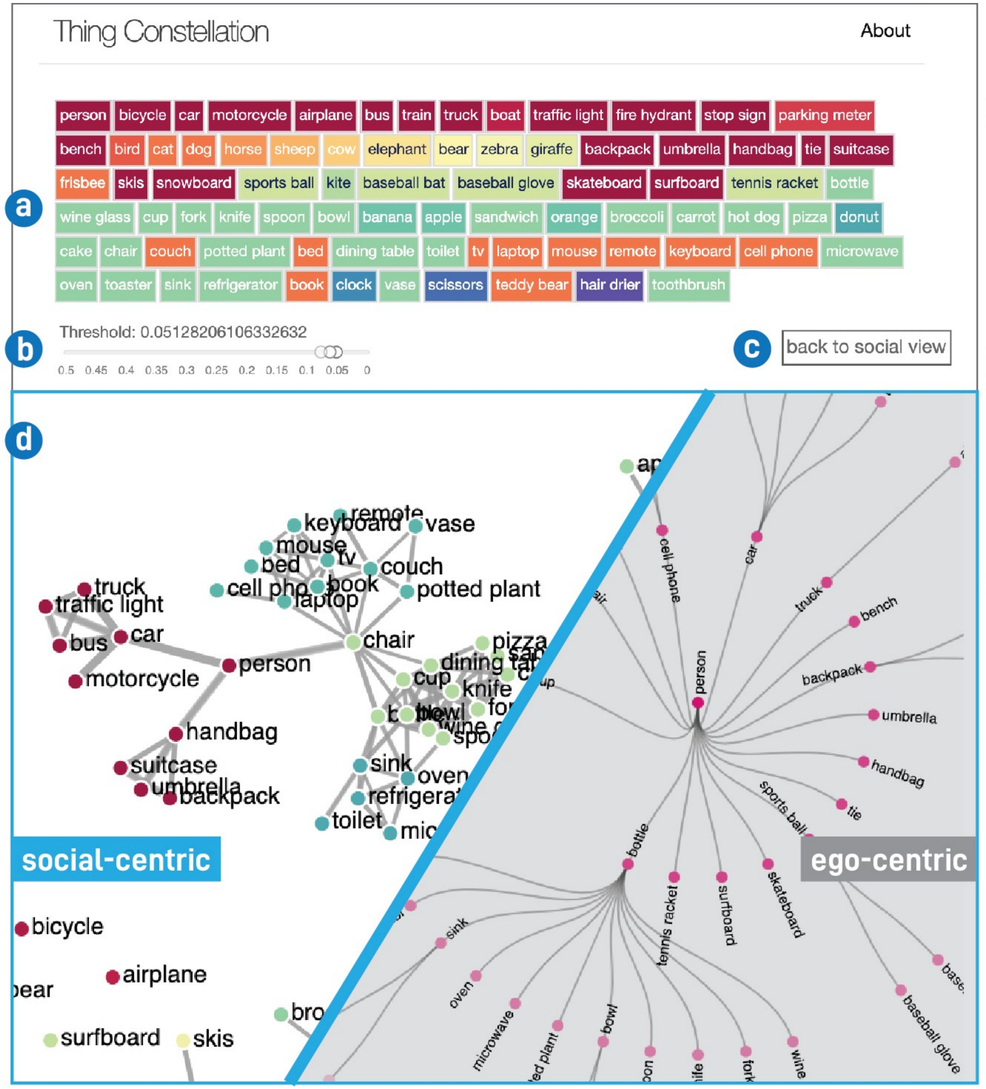


Yi-Ching (Janet) Huang, Yu-Ting Cheng, Rung-Huei Liang, Jane Yung-jen Hsu, and Lin-Lin Chen. 2021. Thing Constellation Visualizer: Exploring Emergent Relationships of Everyday Objects. Proc. *ACM Hum.-Comput. Interact*. 5, CSCW2, Article 479 (October 2021), 29 pages. DOI:https://doi.org/10.1145/3479866



Designing the whole IoT ecosystem needs to understand social relationship between people and objects

Thing Constellation Visualizer



a Object Panel
- objects in the same community are filled with the same colors.
- click any object to zoom into ego-centric view.

b Threshold Slider
- adjust threshold value to determine the density (i.e. numbers of links between nodes).

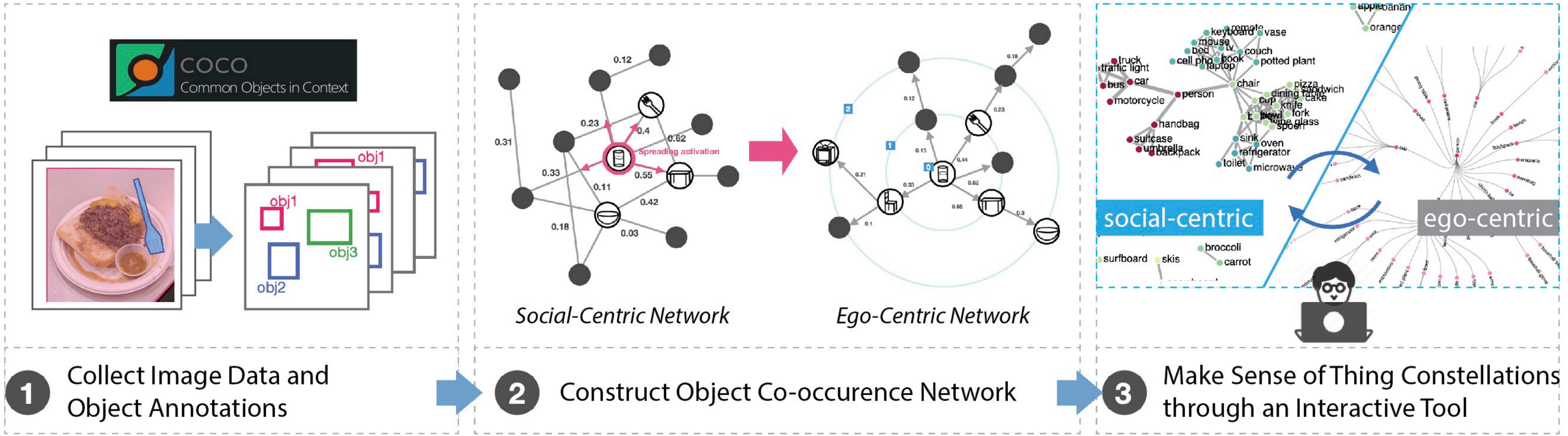
c Switch Button
- switch two views under the same threshold value.

d Thing Constellation Visualisation
- based on the previous selections, here shows the result which can be social-centric or ego-centric constellation.

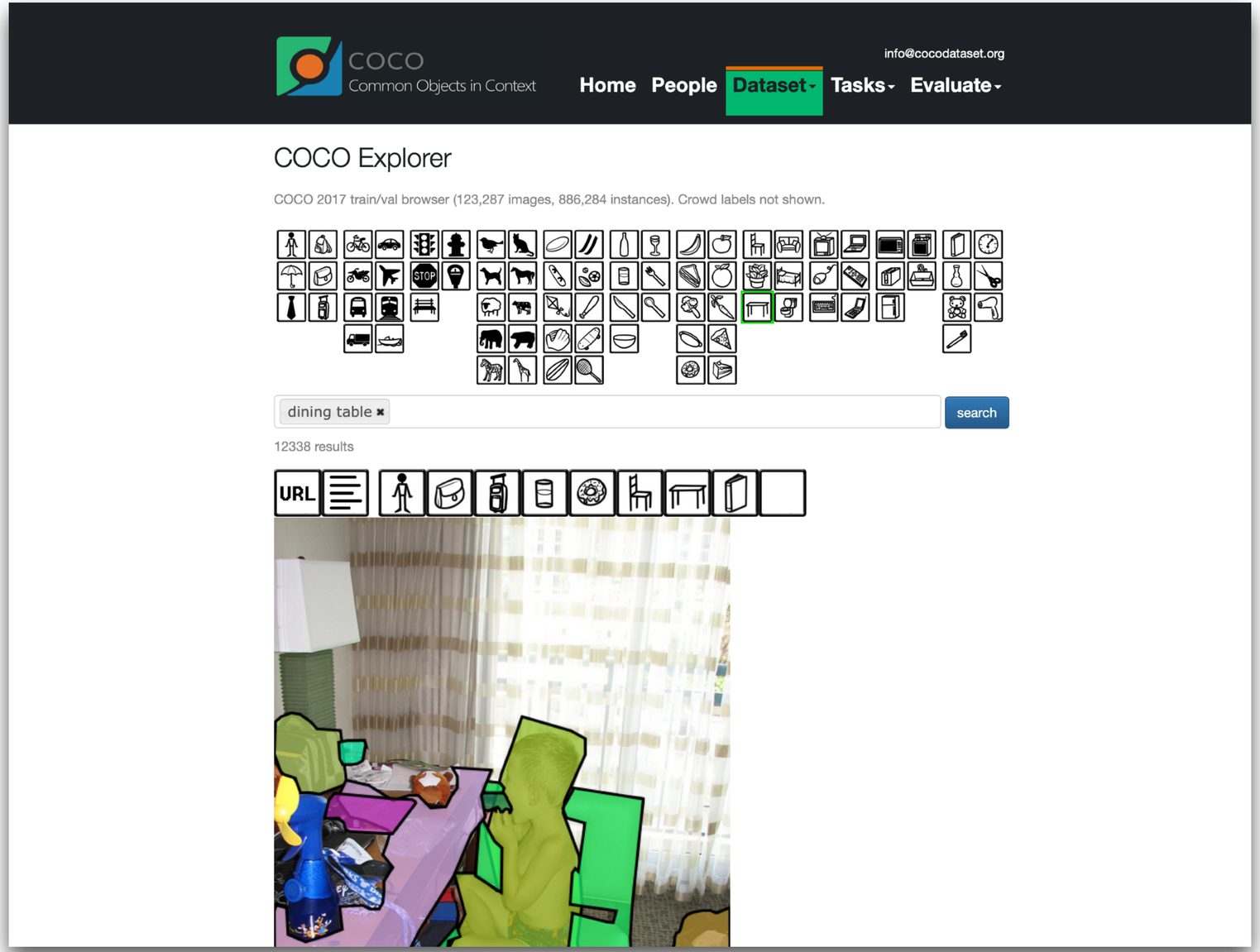
https://thingconstellation.github.io

https://www.youtube.com/watch?v=ASsgLMPhwZo

Data-Driven Design Exploration



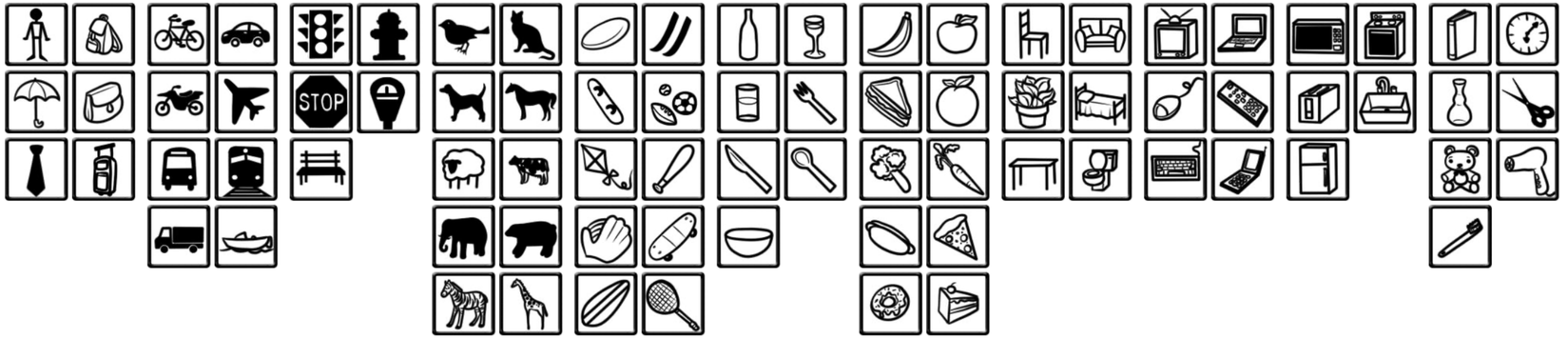
Dataset inside thingCV: COCO dataset



https://cocodataset.org/#home

Exercise 1: Design Your AI agents (20 mins)

- Every group/individual use 15 mins to
  - play with an **existing image dataset (i.e., COCO dataset)**
  - use **thingCV tool** to explore the ecosystem of everyday objects
  - **redesign 1 everyday object** from 80 objects, and think about how this object interact with people.



https://miro.com/app/board/uXjVNbhJJ9M=/?share_link_id=143046459680

AI Canvas

Concept / Idea Description

Describe your idea in 2-3 sentences

1

Contextual situations

When and where will the characters (i.e., target users, multiple stakeholder) use your concept? What is the context (i.e., place, environment, time, etc)

2

The Role of Human

What specific role does human play in your concept? What specific task does human perform?

3

The Role of AI

What specific role does AI play in your concept? What type of AI? What specific task does AI perform?

4

Input Data

Which data items does AI use? How many data does AI need?

5

Feature

What specific characteristic of the data? A feature is a measurable property of the object (data) you are trying to analyze. Features are independent variables that ack like inputs in your system.

6

Output Results

What is the result of your system? Is a binary answer or a numerical number? Or is a multiple-class answer?

7

Open questions / problems?

What AI still cannot do in your concept? Which aspects are still unclear for you in terms of your AI system?

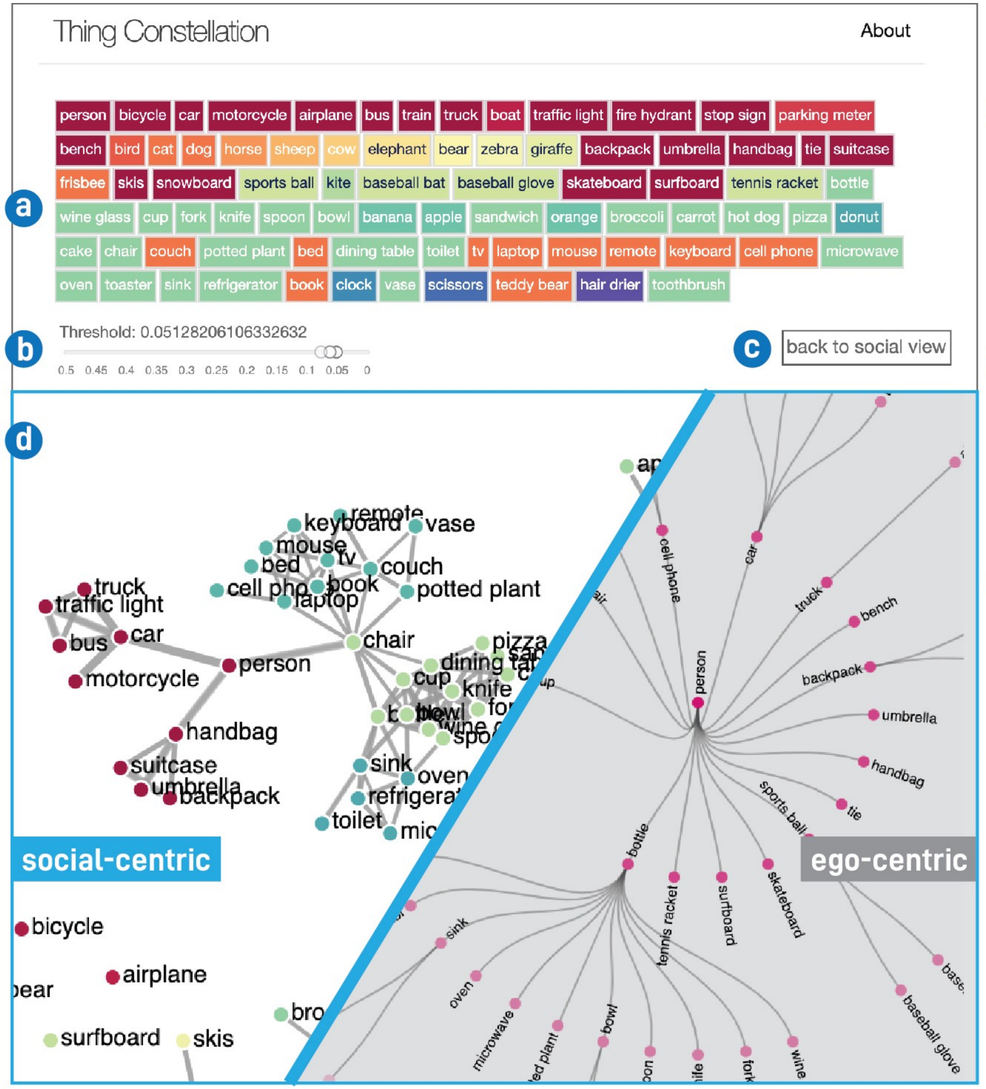
8

AI Canvas, created by Janet

Break

Session II: Build your own thingCV

Thing Constellation Visualizer



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- objects in the same community are filled with the same colors.
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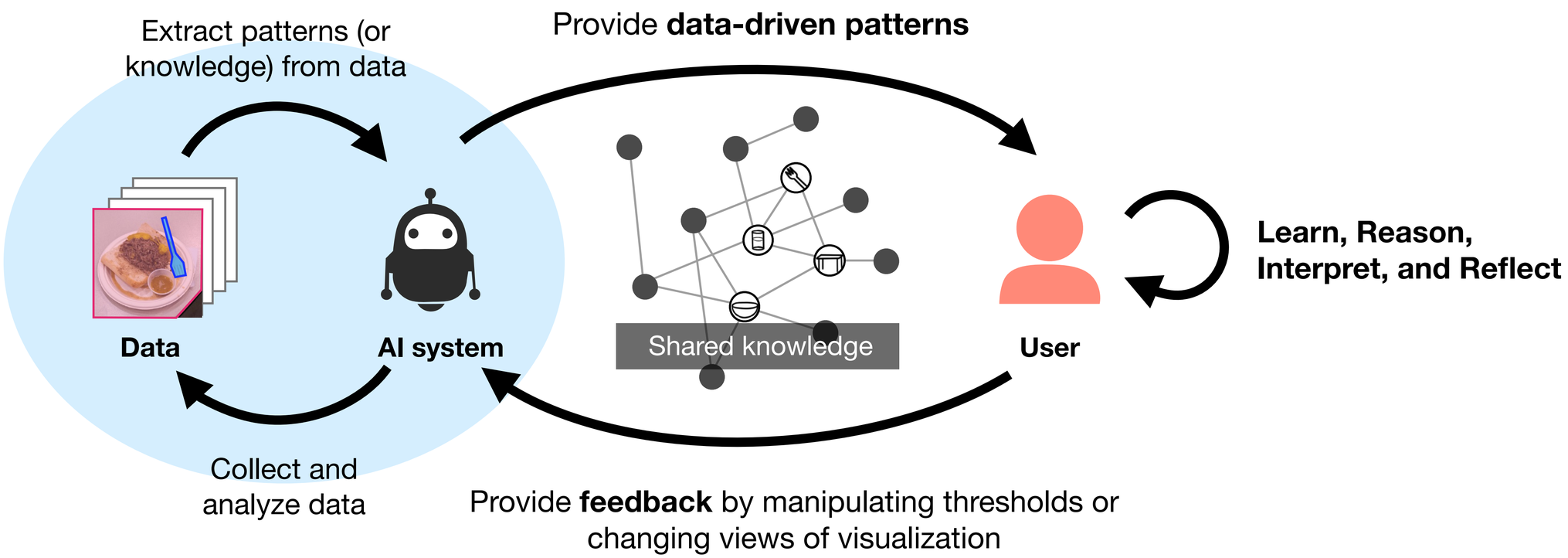
- based on the previous selections, here shows the result which can be social-centric or ego-centric constellation.

https://thingconstellation.github.io



Data-driven pattern + **Human interpretation**

AI Canvas

Object detector

Concept / Idea Description

Describe your idea in 2-3 sentences

Support designers to design IoT ecosystem by enabling them to explore relationships among objects in everyday contexts

1

Contextual situations

When and where will the characters (i.e., target users, multiple stakeholder) use your concept? What is the context (i.e., place, environment, time, etc)

Designers use this tool to understand emergent patterns through data captured on everyday contexts, and further use this tool to come up with future scenarios in which objects collaborate with each other

2

The Role of Human

What specific role does human play in your concept? What specific task does human perform?

* **designers collect data and then fed into AI.**
* **designers interact with data patterns by changing different views through an interface**

3

The Role of AI

What specific role does AI play in your concept? What type of AI? What specific task does AI perform?

- ThingCV will (1) extracts emergent patterns based on a large numbers of photos, (2) visualize the patterns, (3) enable human to play with data patterns through an interactive interface

4

- Object detector identifies objects from a photo or a camera stream

Input Data

Which data items does AI use? How many data does AI need?

* **image data collected from phone**

5

Feature

What specific characteristic of the data? A feature is a measurable property of the object (data) you are trying to analyze. Features are independent variables that ack like inputs in your system.

* **pixel colors (r,g,b), size of image**

6

Output Results

What is the result of your system? Is a binary answer or a numerical number? Or is a multiple-class answer?

* **One or more objects in a phone, each object is indicated by a bounding box, object category, and a confidence score**

7

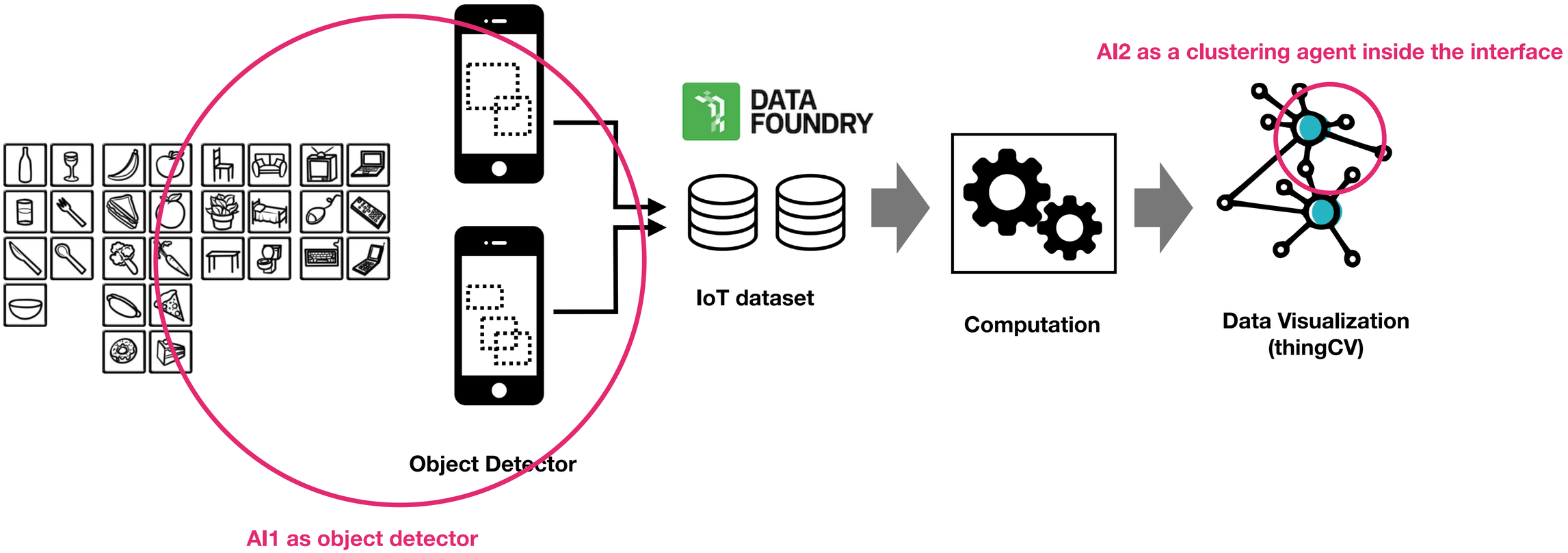
Open questions / problems?

What AI still cannot do in your concept? Which aspects are still unclear for you in terms of your AI system?

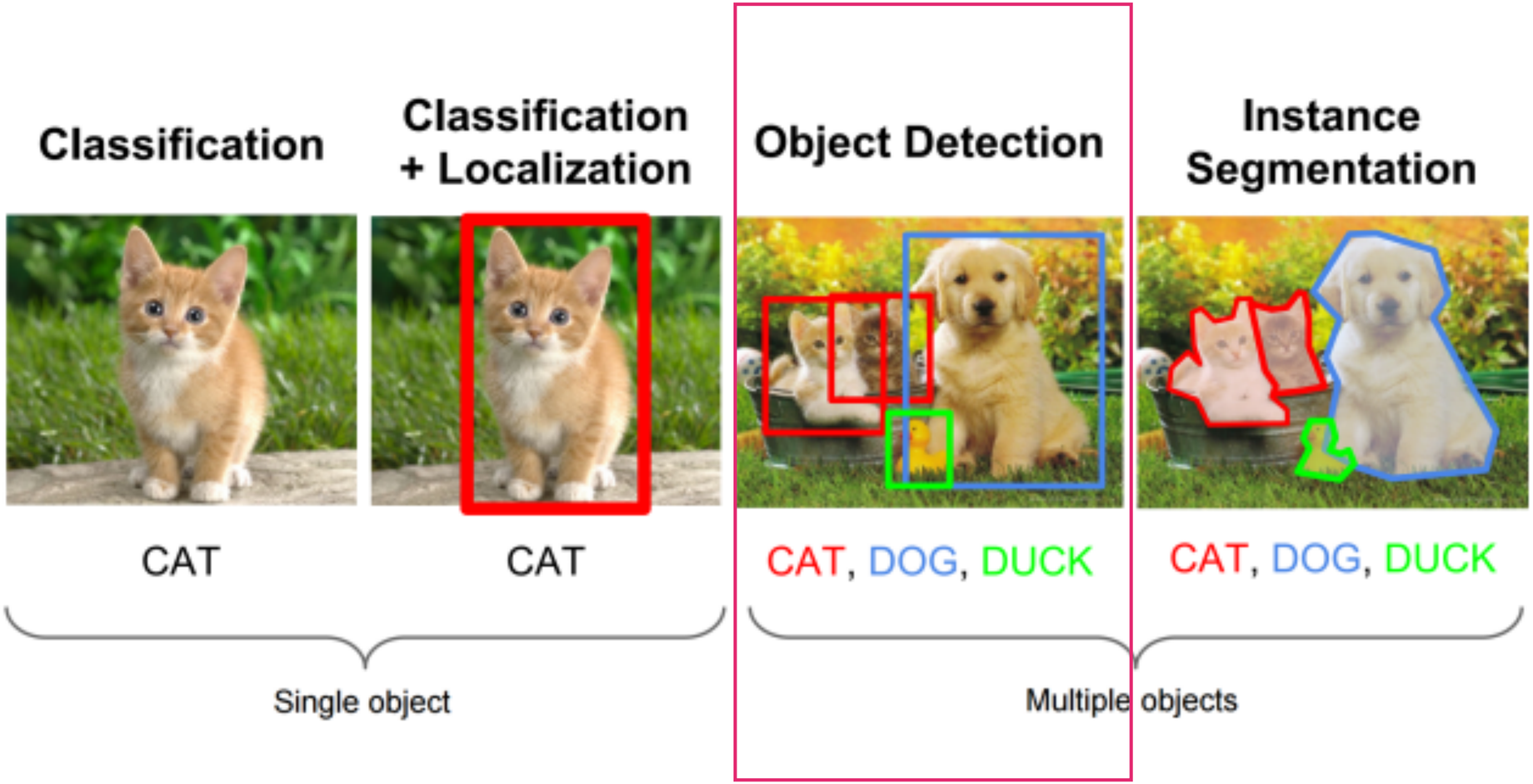
8

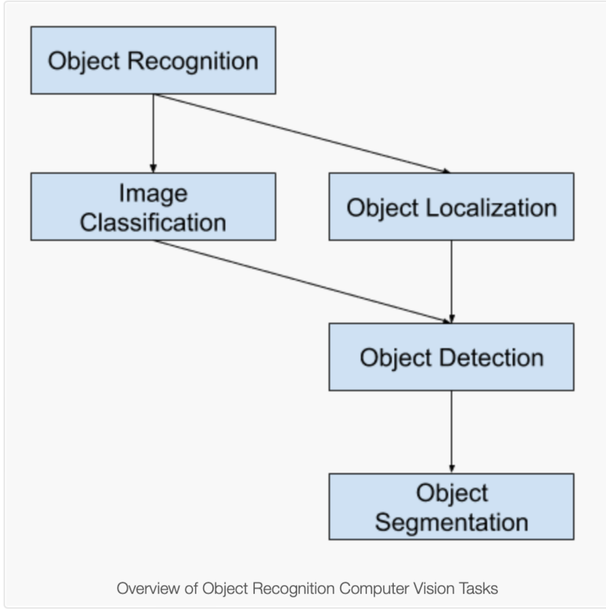
AI Canvas, created by Janet

System Workflow



Object Recognition

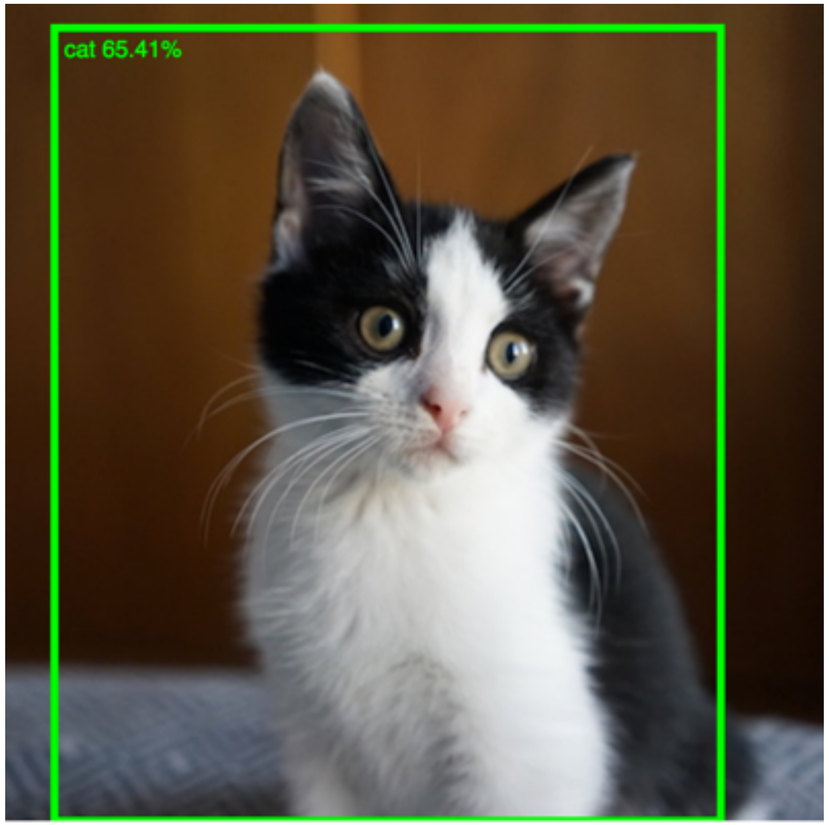




Overview of Object Recognition Computer Vision Tasks

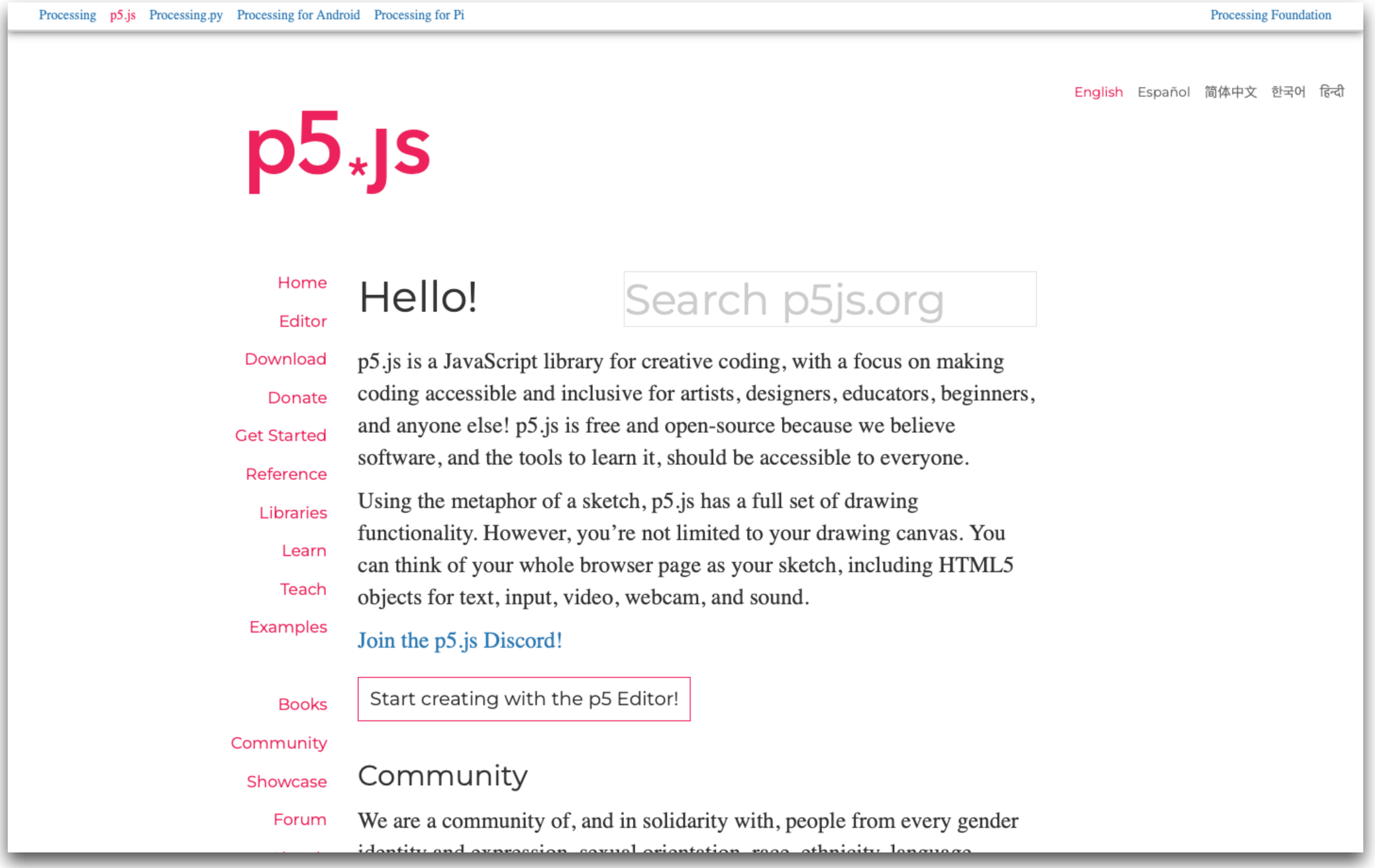
https://medium.com/zylapp/review-of-deep-learning-algorithms-for-object-detection-c1f3d437b852
https://machinelearningmastery.com/object-recognition-with-deep-learning/

Object Detector using ML5.js




```
const video = document.getElementById('video');

// Create a ObjectDetector method
const objectDetector = ml5.objectDetector('cocossd', {}, modelLoaded);

// When the model is loaded
function modelLoaded() {
  console.log('Model Loaded!');
}

// Detect objects in the video element
objectDetector.detect(video, (err, results) => {
  console.log(results); // Will output bounding boxes of detected objects
});
```

https://learn.ml5js.org/#/reference/object-detector



https://p5js.org

https://ml5js.org

What ml5.js can do?

image

ImageClassifier

PoseNet

BodyPix

UNET

Handpose

Facemesh

FaceApi

StyleTransfer

pix2pix

CVAE

SketchRNN

ObjectDetector

sound

SoundClassification

PitchDetection

text

CharRNN

Sentiment

Word2Vec

helpers

NeuralNetwork

FeatureExtractor

KNNClassifier

Kmeans

https://learn.ml5js.org/#/reference/index

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>Getting Started with ml5.js</title>
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <!-- p5 -->
    <script src="https://cdnjs.cloudflare.com/ajax/libs/p5.js/1.0.0/p5.min.js"></script>
    <script src="https://cdnjs.cloudflare.com/ajax/libs/p5.js/1.0.0/addons/p5.sound.min.js"></
script>
    <!-- ml5 -->
    <script src="https://unpkg.com/ml5@latest/dist/ml5.min.js"></script>
  </head>

  <body>
    <script>
      function setup() {
        createCanvas(400, 400);
      }

      function draw() {
        background(200);
      }
    </script>
  </body>
</html>
```

How to use ml5.js?

1. Call ml5 function and load the model
2. Apply the ml5 function to an input (e.g., image, video, text)
3. Do something with the output (e.g., value, labels, points, etc)

p5* File Edit Sketch Help English Hello, janetyc!

Auto-refresh ImageClassification by ml5

Sketch Files

- images
- index.html
- sketch.js

sketch.js

```
Image classification using MobileNet and p5.js
This example uses a callback pattern to create the classifier
=== */

// Initialize the Image Classifier method with MobileNet. A callback needs to be passed.
let classifier;

// A variable to hold the image we want to classify
let img;

function preload() {
  classifier = ml5.imageClassifier('MobileNet');
  img = loadImage('images/bird.jpg');
}

function setup() {
  createCanvas(400, 400);
  classifier.classify(img, gotResult);
  image(img, 0, 0);
}

// A function to run when we get any errors and the results
function gotResult(error, results) {
  // Display error in the console
  if (error) {
    console.error(error);
  }
  // The results are in an array ordered by confidence.
  console.log(results);
  createDiv('Label: ' + results[0].label);
  createDiv('Confidence: ' + nf(results[0].confidence, 0, 2));
}
```

Console Clear

Preview

Image classification using MobileNet and p5.js

imageClassifier('MobileNet')

My guess is a toaster.

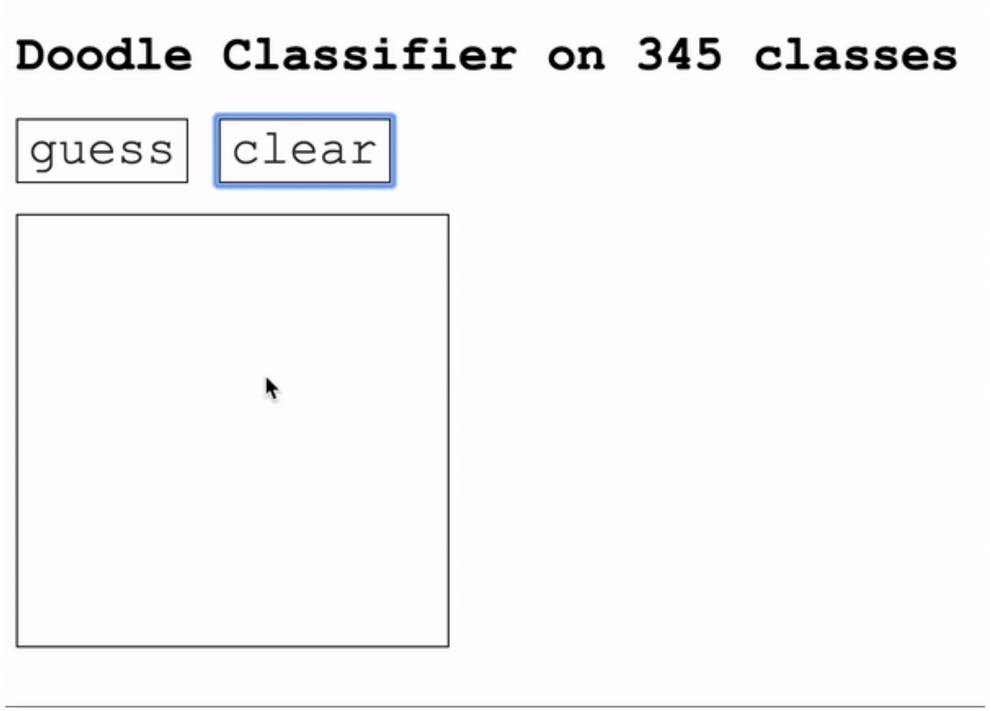
My confidence is 0.12.

```
const classifier = ml5.imageClassifier('MobileNet');

classifier.classify(video, gotResult);

function gotResult(error, result) {
  console.log(result);
}
```

Examples are borrowed from Yining Shi's course "Machine Learning for the web" [slides]

https://editor.p5js.org/ml5/sketches/ImageClassification_Video

imageClassifier('DoodleNet')



https://github.com/yining1023/doodleNet

```
const classifier = ml5.imageClassifier('DoodleNet');

classifier.classify(canvas, gotResult);

function gotResult(error, result) {
  console.log(result);
}
```

https://editor.p5js.org/ml5/sketches/ImageClassification_DoodleNet_Canvas

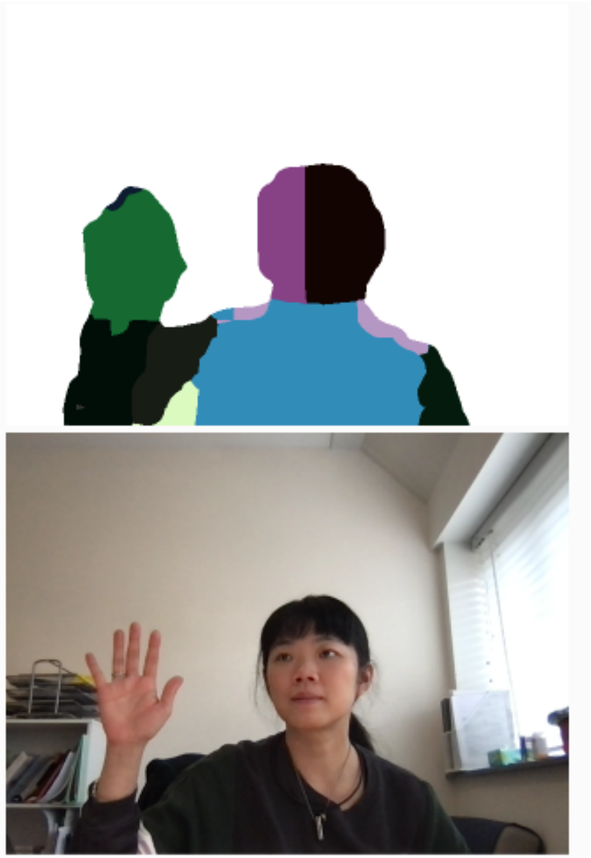
PoseNet

[Image source]

```
const video = document.getElementById('video');

// Create a new poseNet method
const poseNet = ml5.poseNet(video, modelLoaded);

// When the model is loaded
function modelLoaded() {
  console.log('Model Loaded!');
}
// Listen to new 'pose' events
poseNet.on('pose', (results) => {
  poses = results;
});
```

https://editor.p5js.org/ml5/sketches/PoseNet_webcam

BodyPix



```
const bodypix = ml5.bodyPix(modelReady);

function modelReady() {
  // segment the image given
  bodypix.segment(img, gotResults);
}

function gotResults(error, result) {
  if (error) {
    console.log(error);
    return;
  }
  // log the result
  console.log(result.backgroundMask);
}
```

https://editor.p5js.org/ml5/sketches/BodyPix_Webcam_Parts

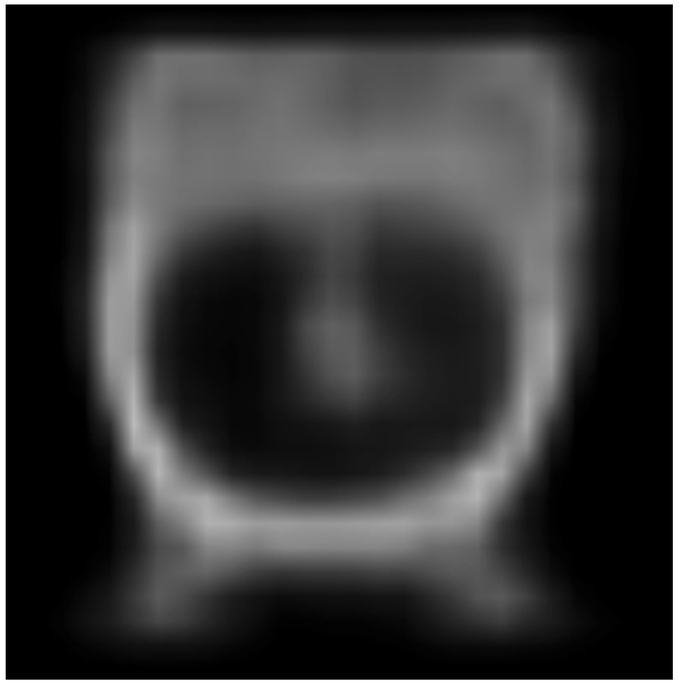
Style Transfer

[Image source]

```
// Create a new Style Transfer Instance
const style = ml5.styleTransfer('data/myModel/', modelLoaded);

// When the model is loaded
function modelLoaded() {
  console.log('Model Loaded!');
}
// Grab a img element and generate a new image.
style.transfer(document.getElementById("img"), function(error, result)
{
  img.src = result.src;
});
```

https://github.com/ml5js/ml5-library/tree/main/examples/p5js/StyleTransfer/StyleTransfer_Video

CVAE (conditional variational autoencoder)

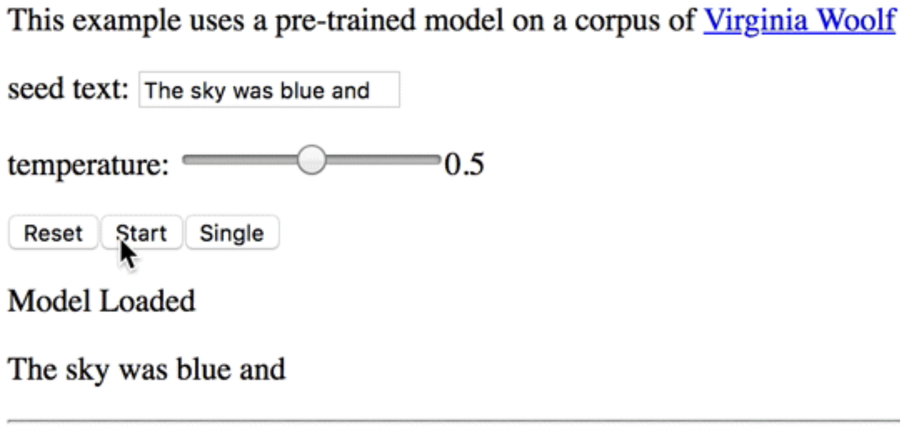


[Image source]

```
const cvae = ml5.CVAE('model/quick_draw/manifest.json', modelReady);

function modelReady() {
  // generate an image of an airplane
  cvae.generate('airplane', gotImage);
}

function gotImage(error, result) {
  if (error) {
    console.log(error);
    return;
  }
  // log the result
  console.log(result);
}
```

https://editor.p5js.org/ml5/sketches/CVAE_QuickDraw

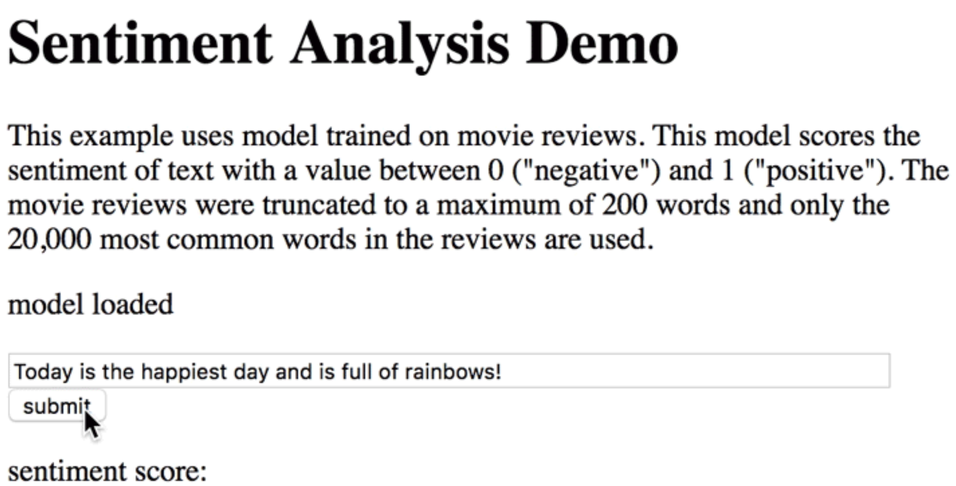
CharRNN




```
// Create the character level generator with a pre trained model
const rnn = ml5.charRNN('models/bolaño/', modelLoaded);

// When the model is loaded
function modelLoaded() {
  console.log('Model Loaded!');
}

// Generate content
rnn.generate({ seed: 'the meaning of pizza is' }, (err, results) => {
  console.log(results);
});
```

https://github.com/ml5js/ml5-library/tree/main/examples/p5js/CharRNN/CharRNN_Text_Stateful

Sentiment Analysis

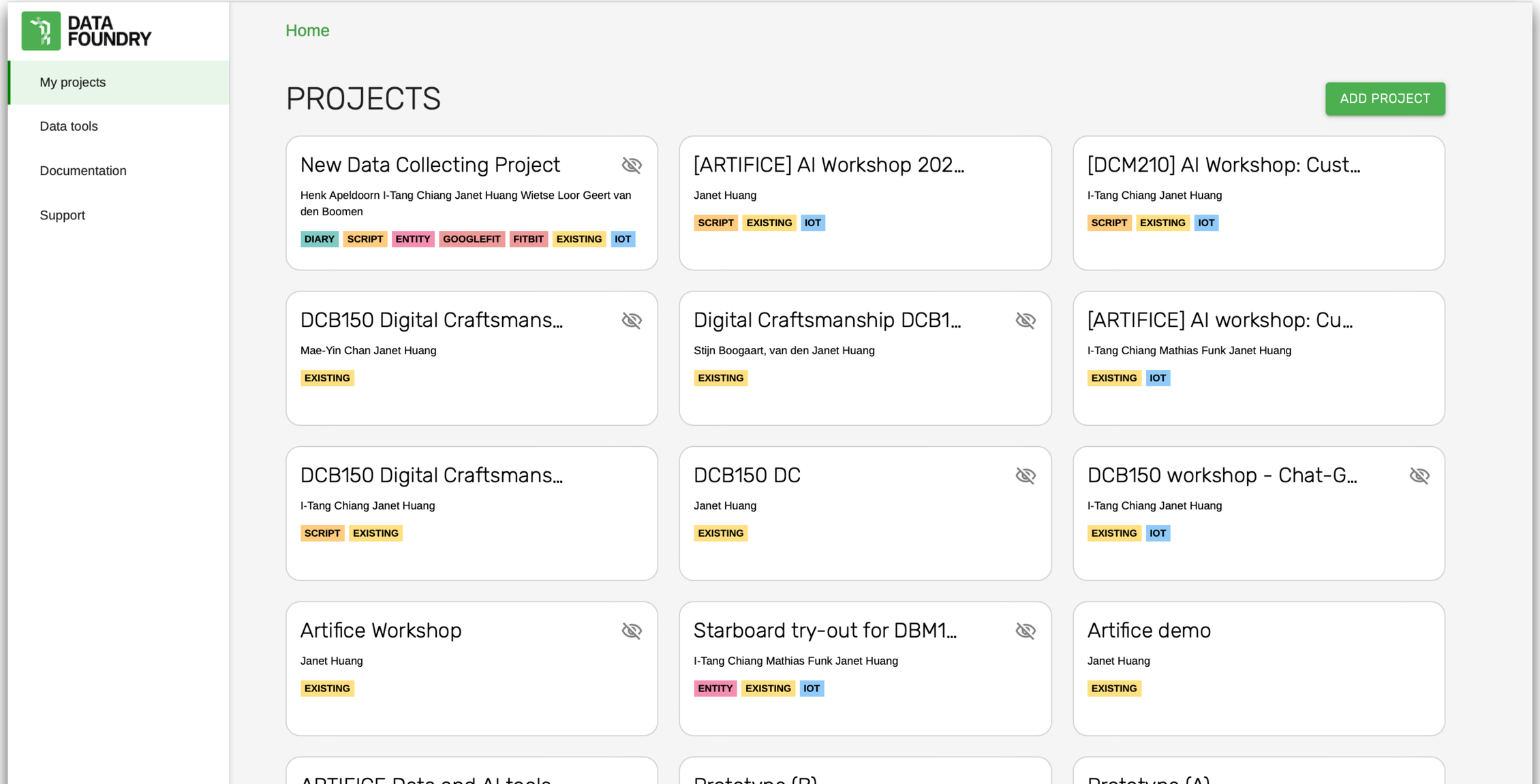



```
// Create a new Sentiment method
const sentiment = ml5.sentiment('movieReviews', modelReady);

// When the model is loaded
function modelReady() {
  // model is ready
  console.log('Model Loaded!');
}

// make the prediction
const prediction = sentiment.predict(text);
console.log(prediction);
```

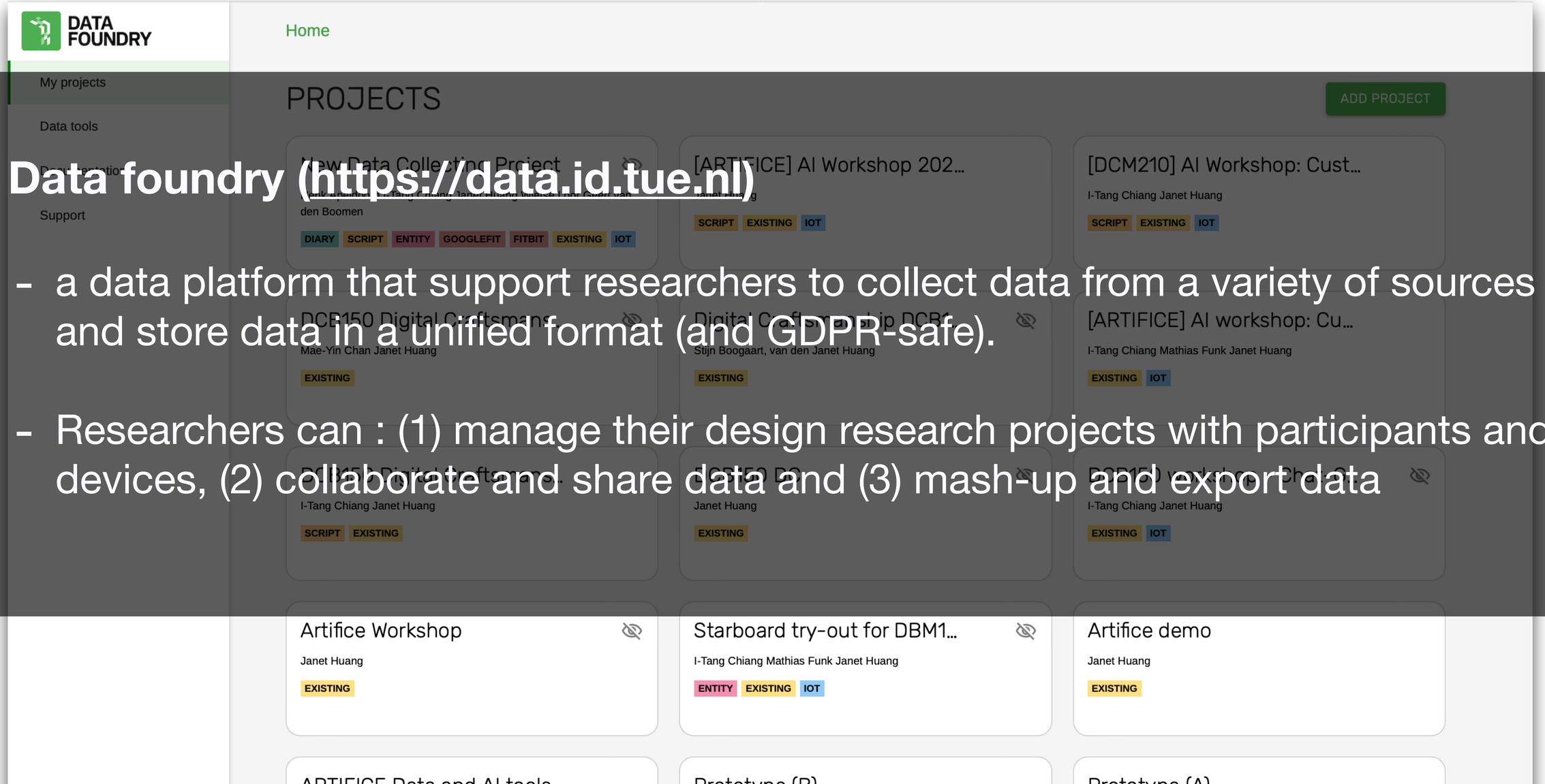
https://editor.p5js.org/ml5/sketches/Sentiment_Interactive

https://data.id.tue.nl

What is Data Foundry?



What is Data Foundry?



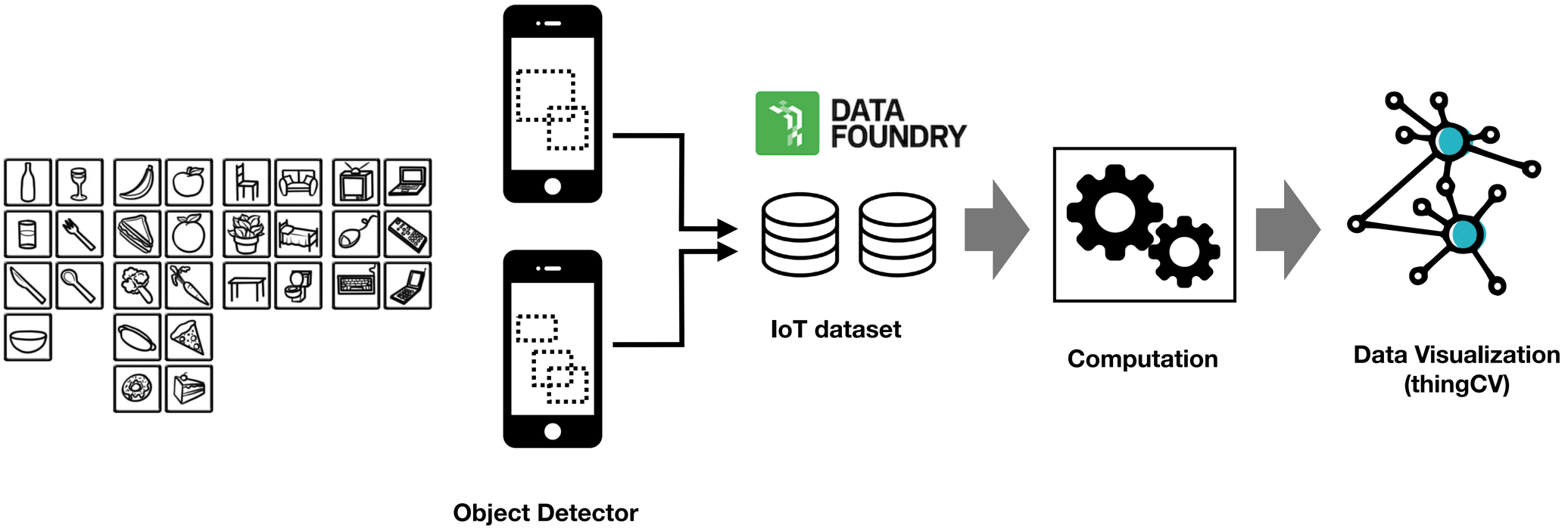
Data foundry (https://data.id.tue.nl)

- a data platform that support researchers to collect data from a variety of sources and store data in a unified format (and GDPR-safe).

- Researchers can : (1) manage their design research projects with participants and devices, (2) collaborate and share data and (3) mash-up and export data

Session II-(1): Object Detector

System Workflow



1

DATA FOUNDRY

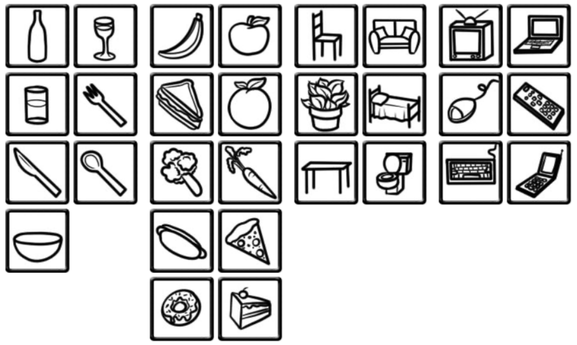
existing dataset

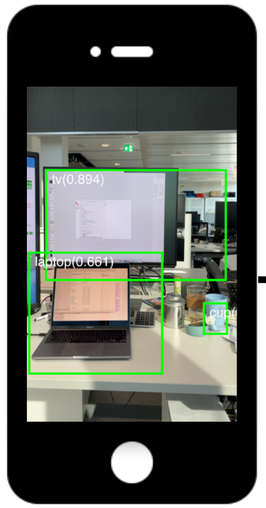
p5.js

ml5

Use DF to host your website that includes an object detector using a pre-trained model

80 everyday objects





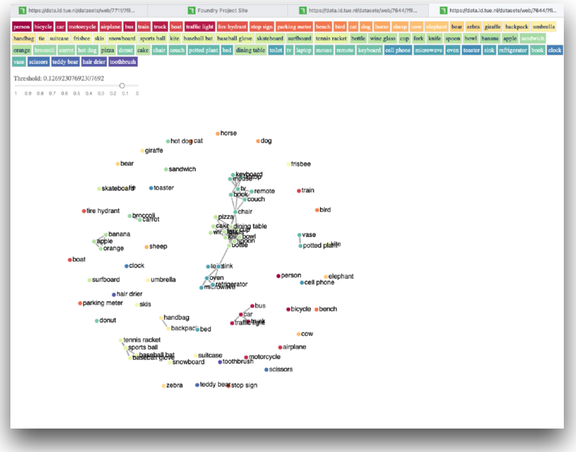
Object Detector

2

DATA FOUNDRY

IoT dataset

Use DF to store object data collected from your object detector



DATA FOUNDRY

existing dataset

3

Use DF to host your website that includes a data visualization

1

DATA FOUNDRY

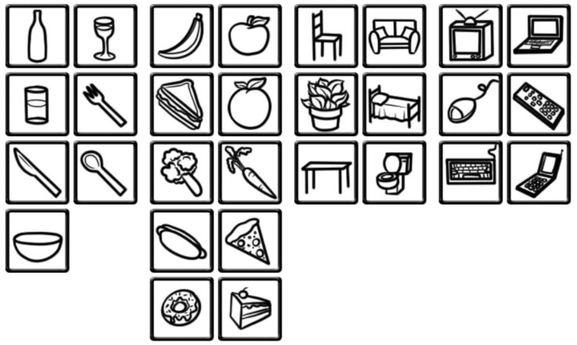
existing dataset

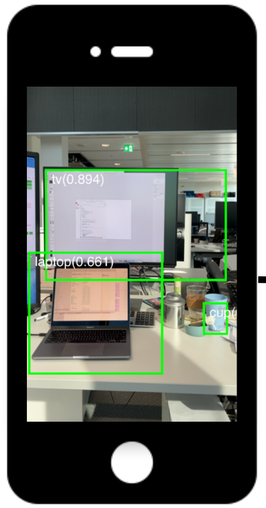
p5.js

ml5

Use DF to host your website that includes an object detector using a pre-trained model

80 everyday objects





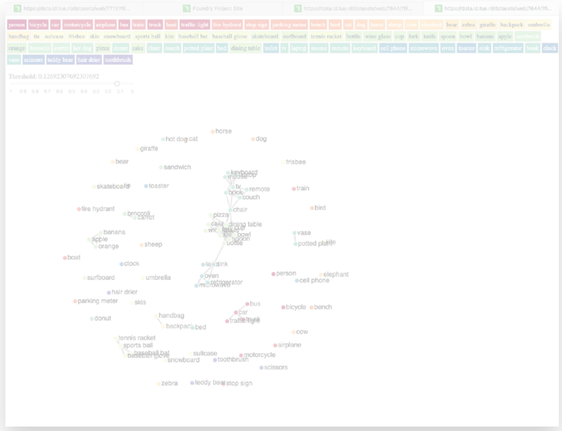
Object Detector

2

DATA FOUNDRY

IoT dataset

Use DF to store object data collected from your object detector



3

DATA FOUNDRY

existing dataset

Use DF to host your website that includes a data visualization

editor.p5js.org

gmail Research agent wiki Good Sites Class Tools Dict Design tool oTranscribe Time Zone academics - Dropbox TU/e 圖庫&Icon

p5.js Web Editor | MDC_Workshop_1_ObjectDetector_Webcam

p5* File Edit Sketch Help English Hello, janetyc!

Auto-refresh MDC_Workshop_1_ObjectDetector_Webcam by janetyc

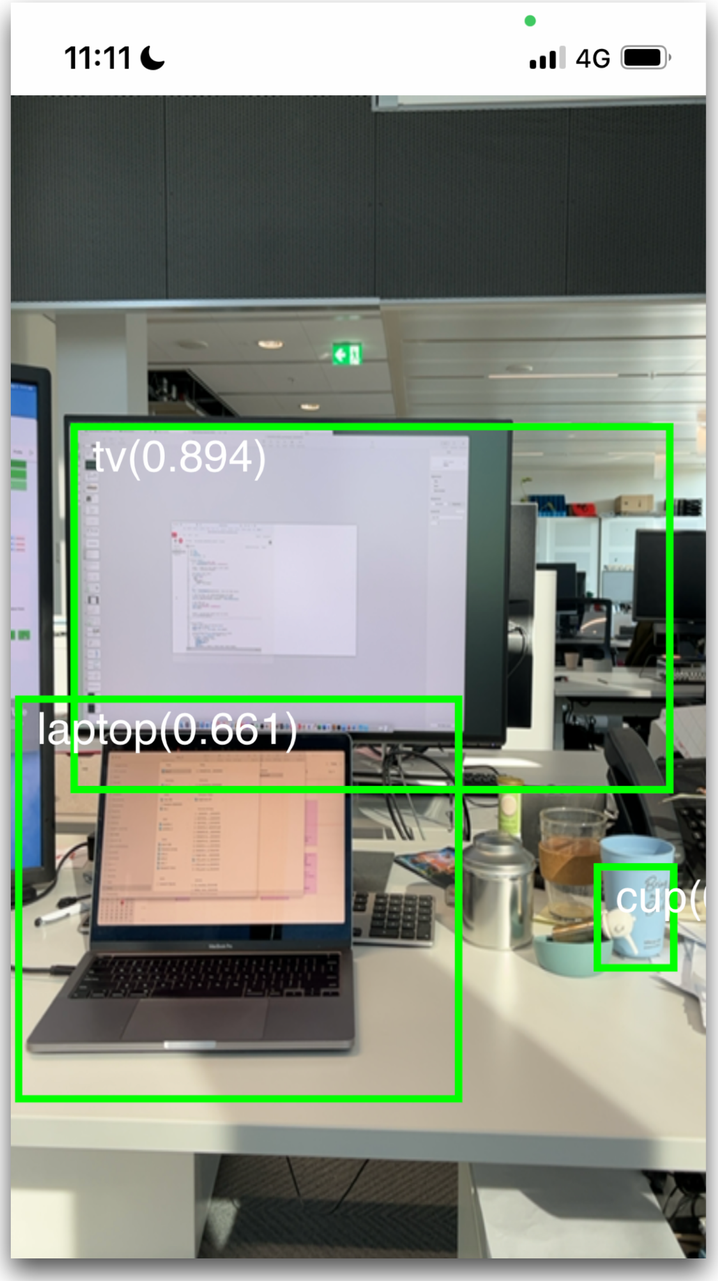
Sketch Files

- index.html
- sketch.js
- style.css

sketch.js Saved: about 18 hours ago Preview

```
let cnv;
let video;
let detector;
let detections = [];

function setup() {
 // cnv = createCanvas(500, 500);
  cnv = createCanvas(windowWidth, windowHeight);

  //Step 1: change the front camera to back camera
  //video = createCapture(VIDEO);

  //use phone's back camera
  var constraints = {
    audio: false,
    video: {
      facingMode: {
        exact: "environment"
      }
    }
  };
  video = createCapture(constraints); //save the video results

  // The line below + the videoLoadedCallback were added
  // after the video was shot to fix compability issues.
  video.elt.addEventListener('loadeddata', videoLoadedCallback);

  // set video size
  //video.size(500, 500);
  video.size(windowWidth, windowHeight);
  video.hide();


  //Step 3: log data when people touch the screen
  //cnv.touchEnded(logData);

}

function draw() {
  //Step 2: draw video and detected objects
  //draw video on canvas
  image(video, 0, 0, video.width, video.height);

  //draw bounding boxes for detected objects on canvas
  for (let i = 0; i < detections.length; i++) {
    let object = detections[i];
    if(object.confidence > 0.6) {
      stroke(0, 255, 0);
      strokeWeight(4);
      noFill();
      rect(object.x, object.y, object.width, object.height);
```

Console Clear



```
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>Getting Started with ml5.js</title>
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <!-- p5 -->
    <script src="https://cdnjs.cloudflare.com/ajax/libs/p5.js/1.0.0/p5.min.js"></script>
    <script src="https://cdnjs.cloudflare.com/ajax/libs/p5.js/1.0.0/addons/p5.sound.min.js"></
script>
    <!-- ml5 -->
    <script src="https://unpkg.com/ml5@latest/dist/ml5.min.js"></script>
  </head>

  <body>
    <script>
      function setup() {
        createCanvas(400, 400);
      }

      function draw() {
        background(200);
      }
    </script>
  </body>
</html>
```

Or you could put the code into “sketch.js” and include it here

```
<body>
  <script src="sketch.js"></script>
</body>
```

```
let cnv;
let video;
let detector;
let detections = [];
```

setup

```
function setup() {
  cnv = createCanvas(windowWidth, windowHeight);
  cnv.touchEnded(logData);
  var constraints = {
    audio: false,
    video: {
      facingMode: {
        exact: "environment"
      }
    }
  };
  video = createCapture(constraints);

  // The line below + the videoLoadedCallback were added
  // after the video was shot to fix compability issues.
  video.elt.addEventListener('loadeddata', videoLoadedCallback);

  video.size(windowWidth, windowHeight);
  video.hide();

}
```

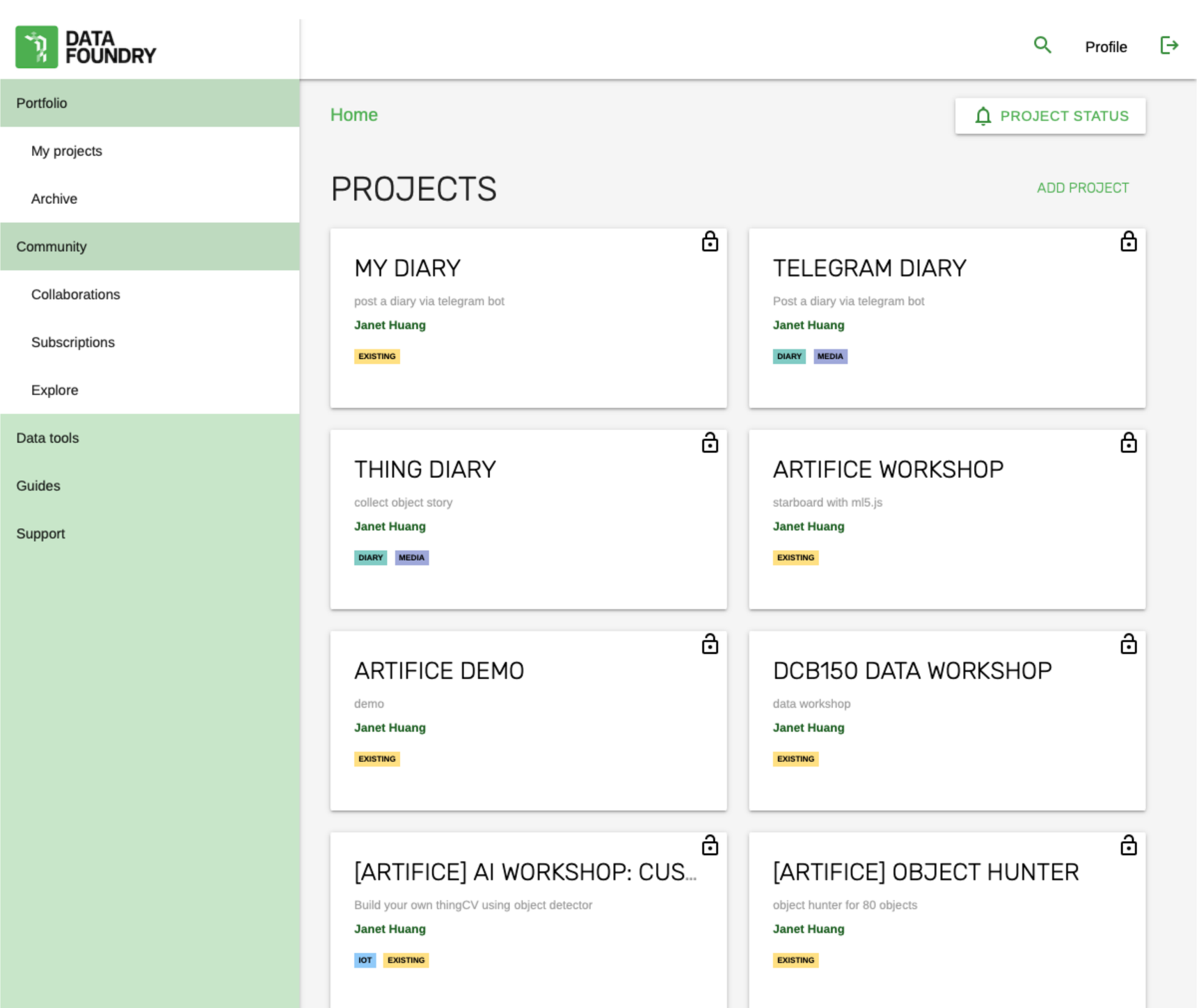
draw

```
function draw() {
  image(video, 0, 0, video.width, video.height);

  for (let i = 0; i < detections.length; i++) {
    let object = detections[i];
    if(object.confidence > 0.6) {
      stroke(0, 255, 0);
      strokeWeight(4);
      noFill();
      rect(object.x, object.y, object.width, object.height);
      noStroke();
      fill(255);
      textSize(24);
      text(object.label+"("+object.confidence.toFixed(3)+")", object.x + 10, object.y + 24);
    }
  }
}
```

objectDetector

```
//solve loaded video issues
function videoLoadedCallback() {
  print("Video Loaded");

  //call model here
  // Models available are 'cocossd', 'yolo'
  detector = ml5.objectDetector('cocossd', modelReady);
}

function modelReady() {
  detector.detect(video, gotDetections);
}

function gotDetections(error, results) {
  if (error) {
    console.error(error);
  }
  detections = results;
  detector.detect(video, gotDetections);
}
```

https://editor.p5js.org/janetyc/sketches/B3OQu3wvU

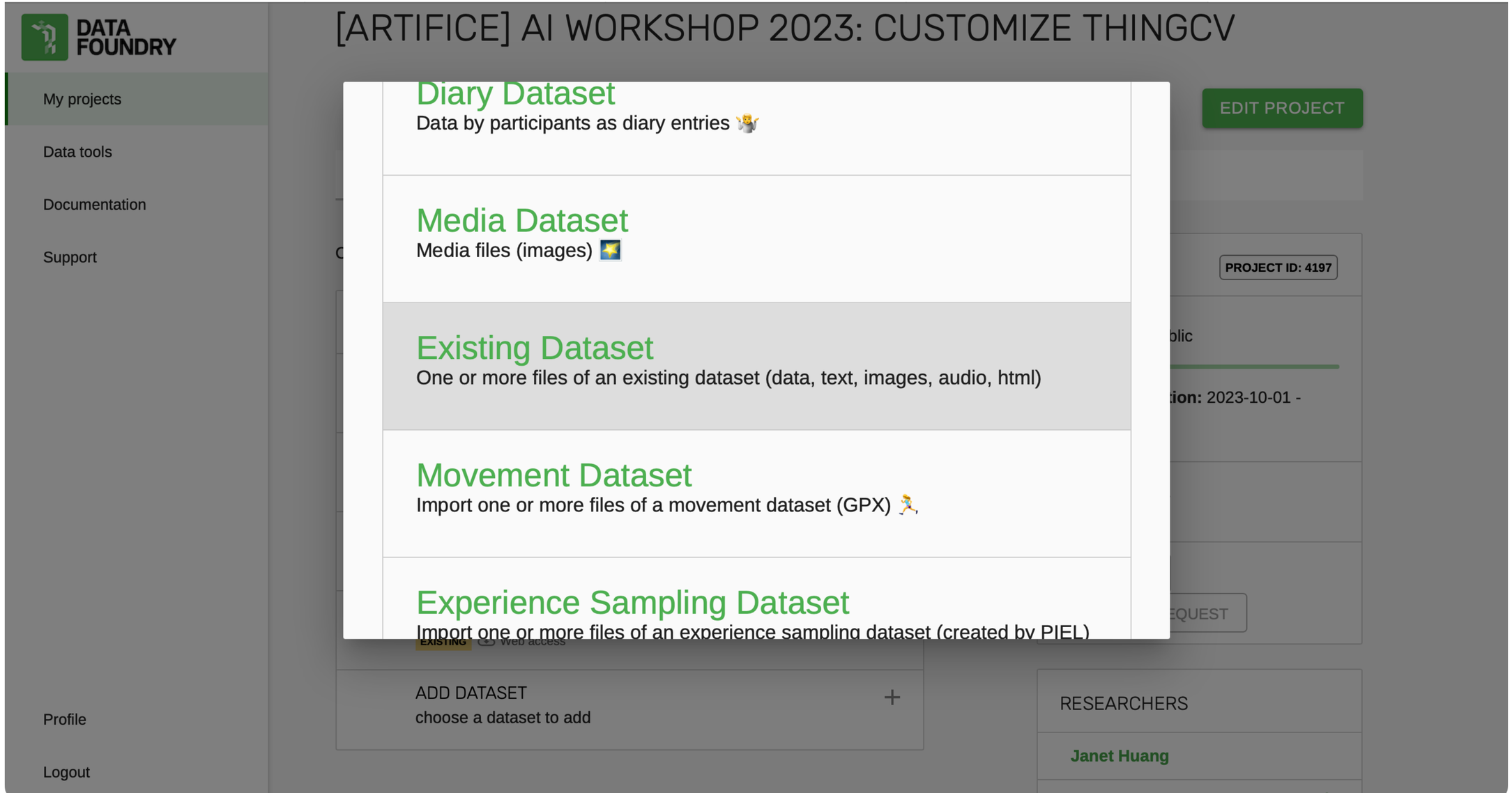


Data Foundry

Data Foundry is a platform that supports researchers to design intelligent interactive product.

It enables an easier way of collecting data, storing data, connecting data, and sharing data with other people. It also provides multiple useful tools for researchers to do rapid prototyping.

Data Foundry: Existing Dataset



DATA FOUNDRY

Profile

- Portfolio
  - My projects
  - Archive
- Community
  - Collaborations
  - Subscriptions
  - Explore
- Data tools
- Guides
- Support

Home > [DCM210] AI Workshop: Customized your thingCV > Object Detector using ml5.js

id: 7641 EXISTING PUBLIC MIT

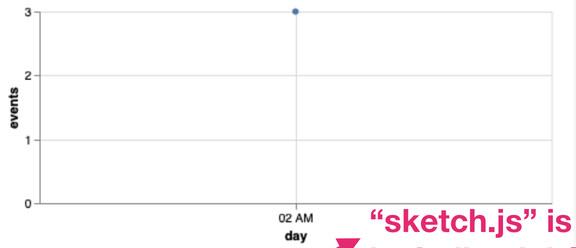
OBJECT DETECTOR USING ML5.JS

2023-03-01 — 2024-03-01

an object detector that can detect 80 objects through a camera

INFO

License: MIT



VIEW DATA

DOWNLOAD

UPLOAD FILE(S)

"sketch.js" is the main file we are working on, including init() and draw()

DATASET FILES

File name	Description	Uploaded	
sketch.js	object detector	Mar 01 at 14:27	edit | delete
style.css	object detector	Mar 01 at 14:27	edit | delete
index.html	object detector	Mar 01 at 14:27	edit | delete

"index.html" is the entry point for your website

CONFIGURATION

CSV/JSON TOK... | WEB-ACCESS | OOCSI STREAM

Access the data as a website

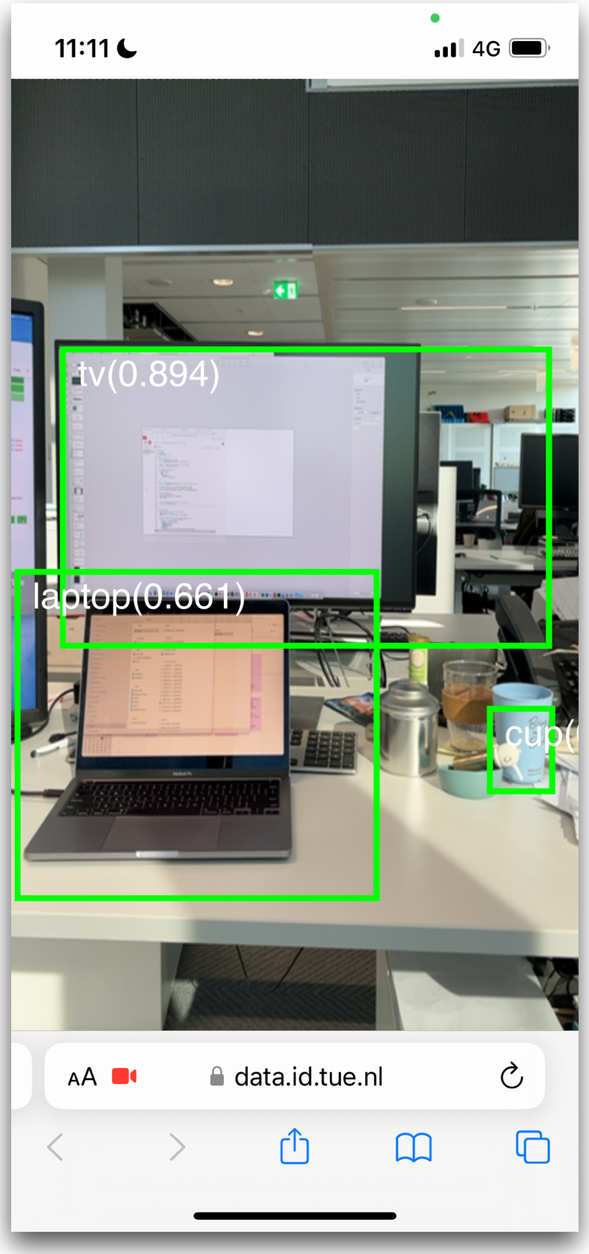
As the *research team*, you can always access the dataset as a website, if the dataset is active. (This is independent from public accessibility.)

This dataset is accessible as a public website with the following link:

It is a link for your public website

`https://data.id.tue.nl/web/dStvaTU4ZGZKVVZLeGtPNU5FTVVlQWs1MFFidk1xMlZQUVlp`

ACTIVATE WEB ACCESS DISABLE WEB ACCESS



Exercise 2: Build a object detector (20 mins)

Step 1: Create you DF project
Step 2: Create “an existing dataset”
Step 3: Download the source code and submit the code to the existing dataset
Step 4: Find the link and play with your object detector

DATA FOUNDRY

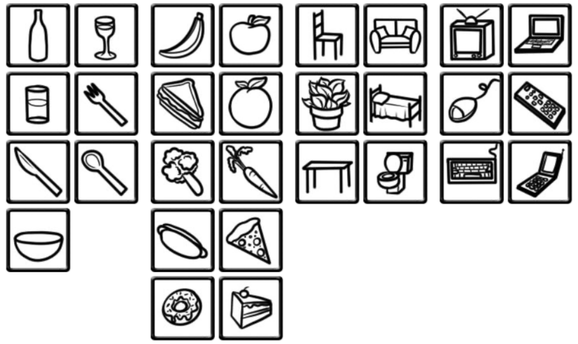
existing dataset

p5.js

ml5

Use DF to host your website that includes an object detector using a pre-trained model

80 everyday objects



Object Detector

Share your thoughts with your peers!!

Break

Session II-(2) : Store data in DF

1

DATA FOUNDRY

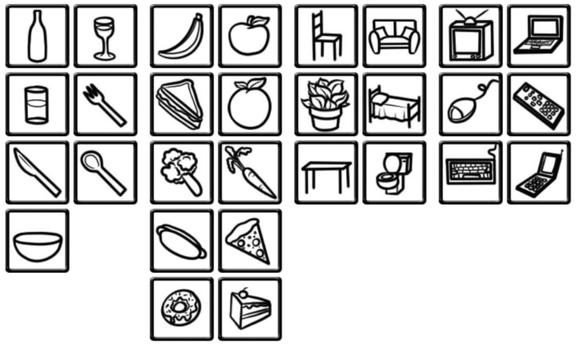
existing dataset

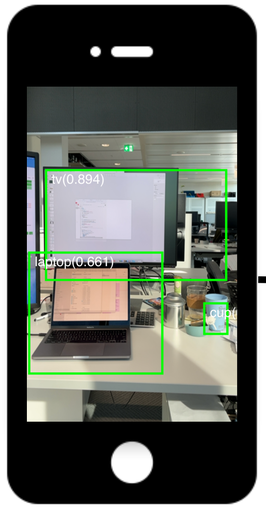
p5.js

ml5

Use DF to host your website that includes an object detector using a pre-trained model

80 everyday objects





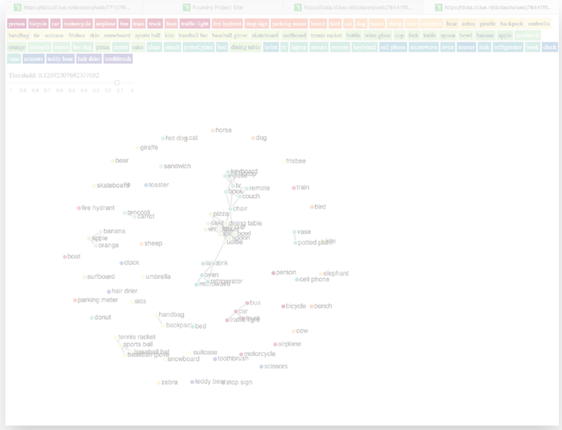
Object Detector

2

DATA FOUNDRY

IoT dataset

Use DF to store object data collected from your object detector



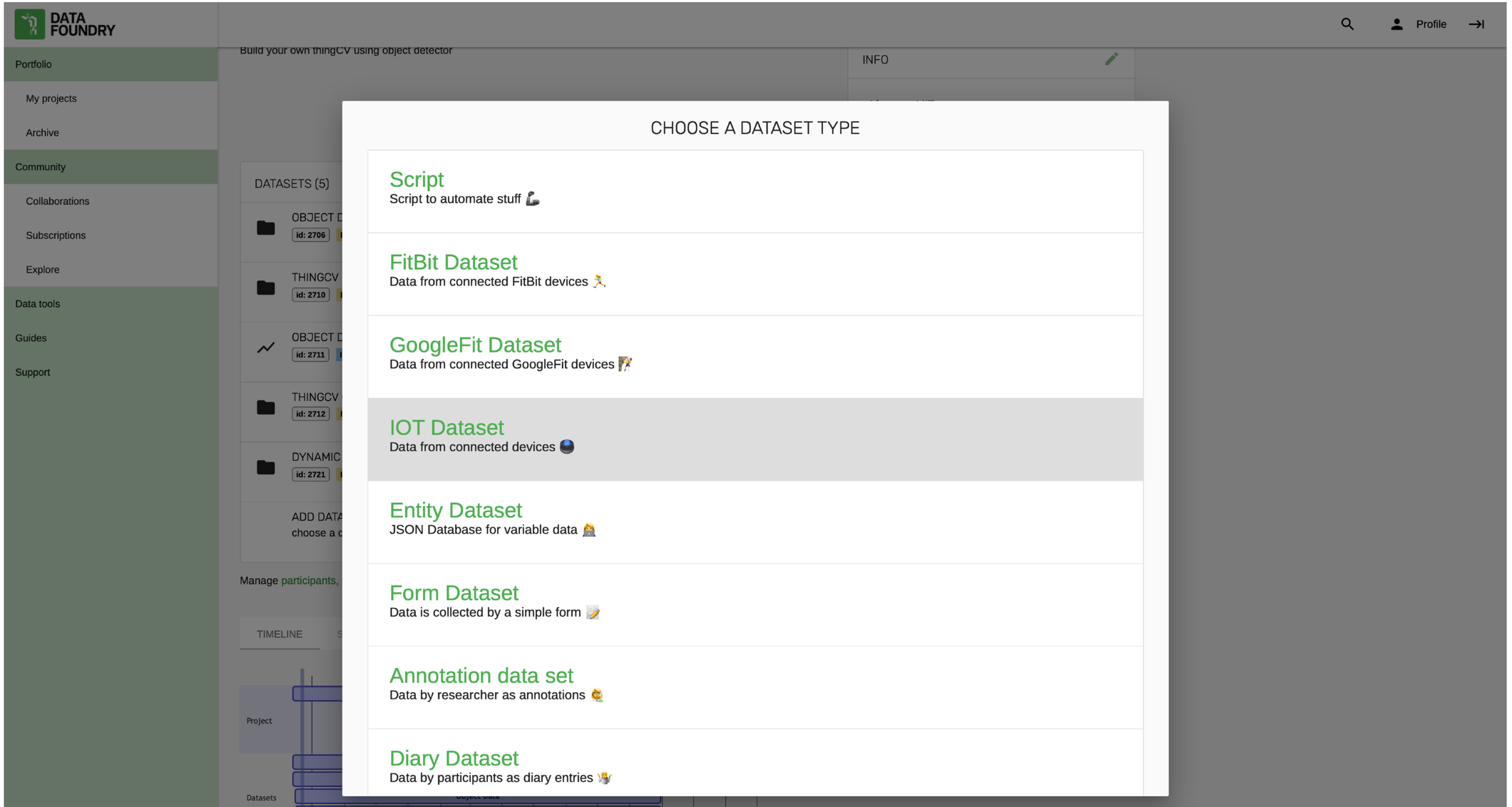
DATA FOUNDRY

existing dataset

3

Use DF to host your website that includes a data visualization

Data Foundry: IoT Dataset



CONFIGURATION

HTTP-POST | OOCSI STREAM | CSV/JSON TOKEN LINK | OOCSI STREAM

HTTP POST requests for this dataset (ID: **9330**)

POST requests are easy to send from a wide variety of platforms and technologies. Find a list of possible options on the right side.

To allow these requests to store data in the dataset, you need to send them with a special token:

Token

N3pCQTRjbUlldFdWMXZkTmJpOFBlMmlCOGlCRnhPUGRhaTd1amt2TnhDUT0=

GENERATE DELETE

Generate a token to activate this inlet, delete the token to deactivate.

HTTP POST Diagnostics

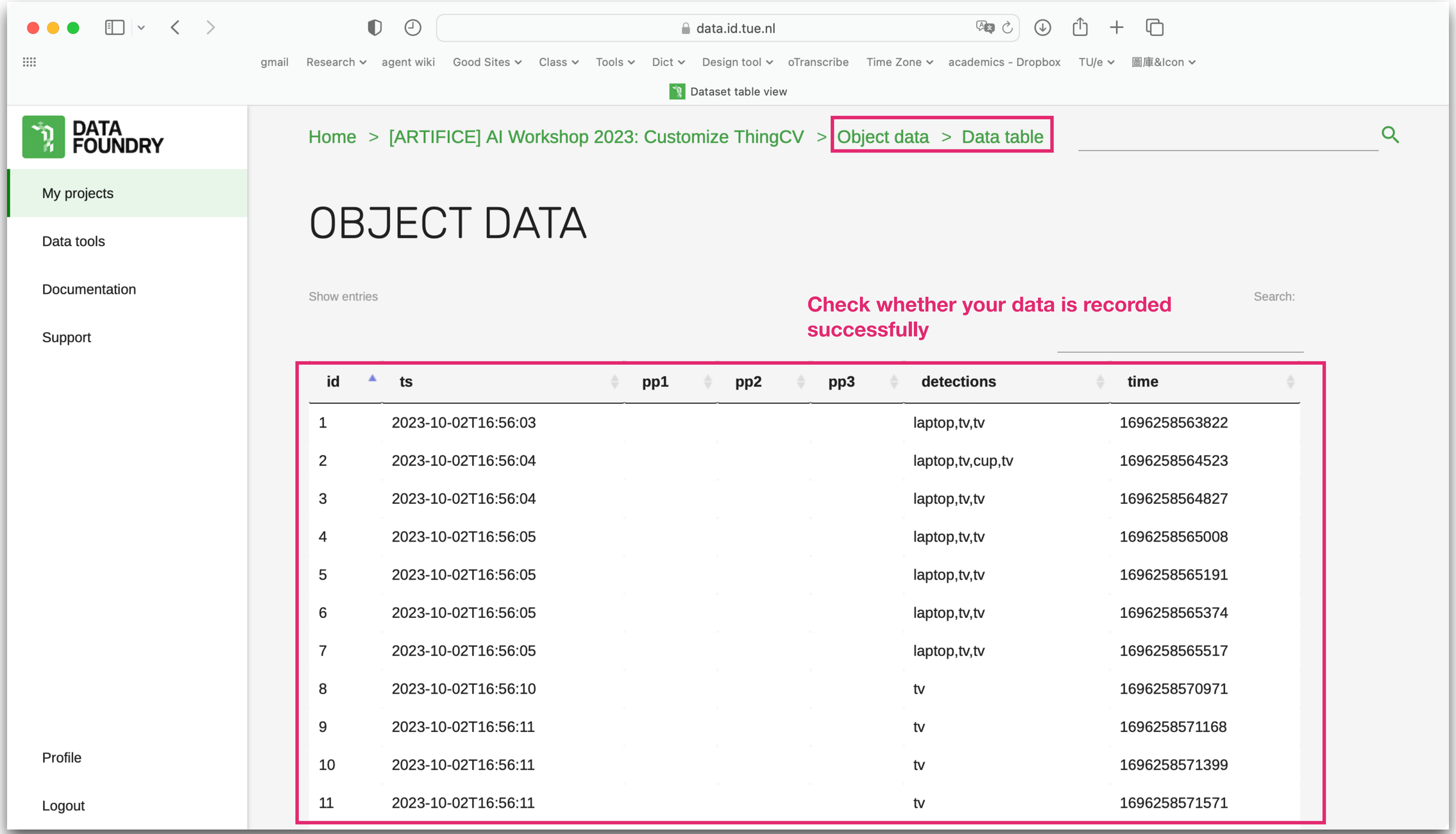
How to use this?

JavaScript

```
var data = { ... your data goes here ... }
var jsonBody = {
    activity: 'ACTIVITY',
    source_id: 'DEVICE_ID',
    data: JSON.stringify(data)
}
fetch('https://data.id.tue.nl/datasets/ts/record/9330/N3pCQTRjbUlIdFdWMXZkTmJpOFBlMmlCOGlCRnhPUGRhaTd1amt2T
    method: 'POST',
    mode: 'cors',
    cache: 'no-cache',
    headers: {
            'Content-Type': 'application/json'
    },
    redirect: 'follow',
    referrerPolicy: 'no-referrer',
    body: JSON.stringify(jsonBody)
});
```

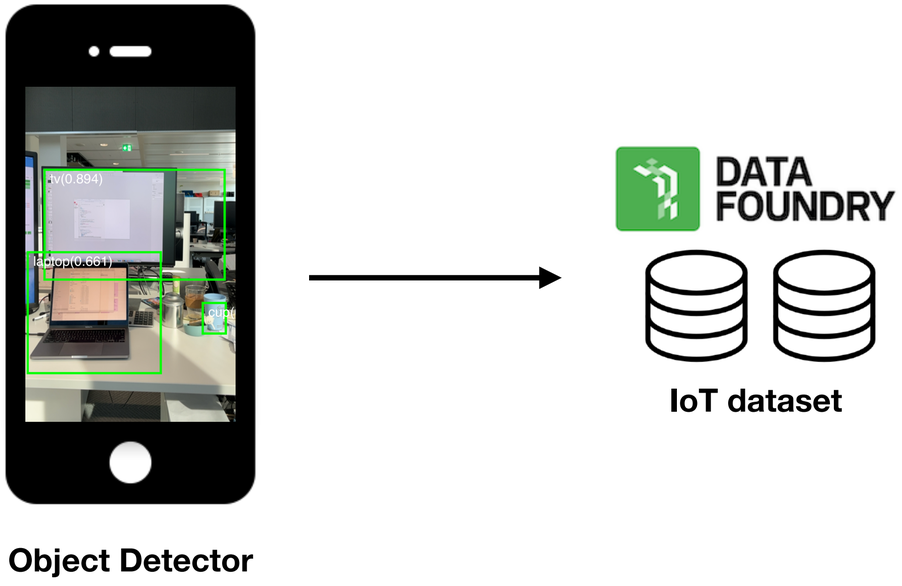
Replace DEVICE_ID by the refId attribute of any device in the project. Use any ACTIVITY or leave empty. Provide `data` in JSON format, such as `{"parameter1": 2, "parameter2": 5}`

```
92
93  function logData() {
94    final_detections = detections
95    objectList = getDetectionObjects(final_detections);
96
97    let data= {
98      time: +(new Date),
99      detections: objectList
100   }
101
102   let jsonBody = {
103     activity: 'Customize_ThingCV',
104     data: JSON.stringify(data)
105   }
106
107   fetch('https://data.id.tue.nl/datasets/ts/record/7642/MzIySFJHSFNqUjkzMHVWSmovSS9DMEhkMitEY25GV3
108       method: 'POST',
109       mode: 'cors',
110       cache: 'no-cache',
111       headers: {
112               'Content-Type': 'application/json'
113       },
114       redirect: 'follow',
115       referrerPolicy: 'no-referrer',
116       body: JSON.stringify(jsonBody)
117   });
118 }
119
```


data.id.tue.nl
gmail
Research
agent wiki
Good Sites
Class
Tools
Dict
Design tool
oTranscribe
Time Zone
academics - Dropbox
TU/e
圖庫&Icon
Dataset table view
DATA FOUNDRY
My projects
Data tools
Documentation
Support
Profile
Logout
Home > [ARTIFICE] AI Workshop 2023: Customize ThingCV > Object data > Data table
OBJECT DATA
Show entries
Check whether your data is recorded successfully
Search:
id
ts
pp1
pp2
pp3
detections
time
1 2023-10-02T16:56:03 laptop,tv,tv 1696258563822
2 2023-10-02T16:56:04 laptop,tv,cup,tv 1696258564523
3 2023-10-02T16:56:04 laptop,tv,tv 1696258564827
4 2023-10-02T16:56:05 laptop,tv,tv 1696258565008
5 2023-10-02T16:56:05 laptop,tv,tv 1696258565191
6 2023-10-02T16:56:05 laptop,tv,tv 1696258565374
7 2023-10-02T16:56:05 laptop,tv,tv 1696258565517
8 2023-10-02T16:56:10 tv 1696258570971
9 2023-10-02T16:56:11 tv 1696258571168
10 2023-10-02T16:56:11 tv 1696258571399
11 2023-10-02T16:56:11 tv 1696258571571

Exercise 3: Store object data to DF

Step 1: Create an IoT dataset
Step 2: Find the HTTP-POST link under the IoT dataset storing your object data
Step 3: Create a mouse-clicked event to upload your object data through the HTTP-POST link
Step 4: Check whether your data been stored on DF successfully



Use DF to store object data collected from your object detector

DATA FOUNDRY

existing dataset

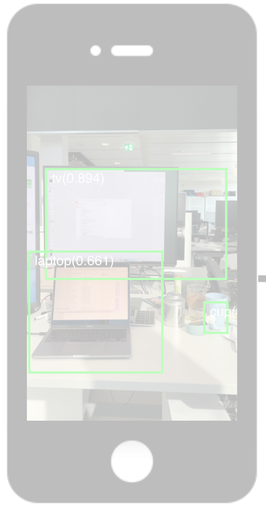
1

p5.js

ml5

Use DF to host your website that includes an object detector using a pre-trained model

80 everyday objects



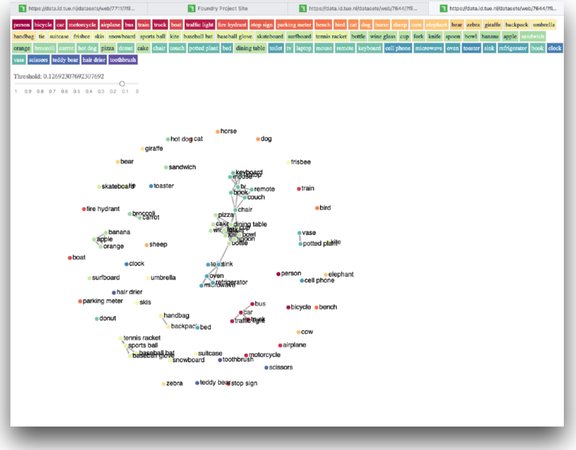
Object Detector

2

DATA FOUNDRY

IoT dataset

Use DF to store object data collected from your object detector



DATA FOUNDRY

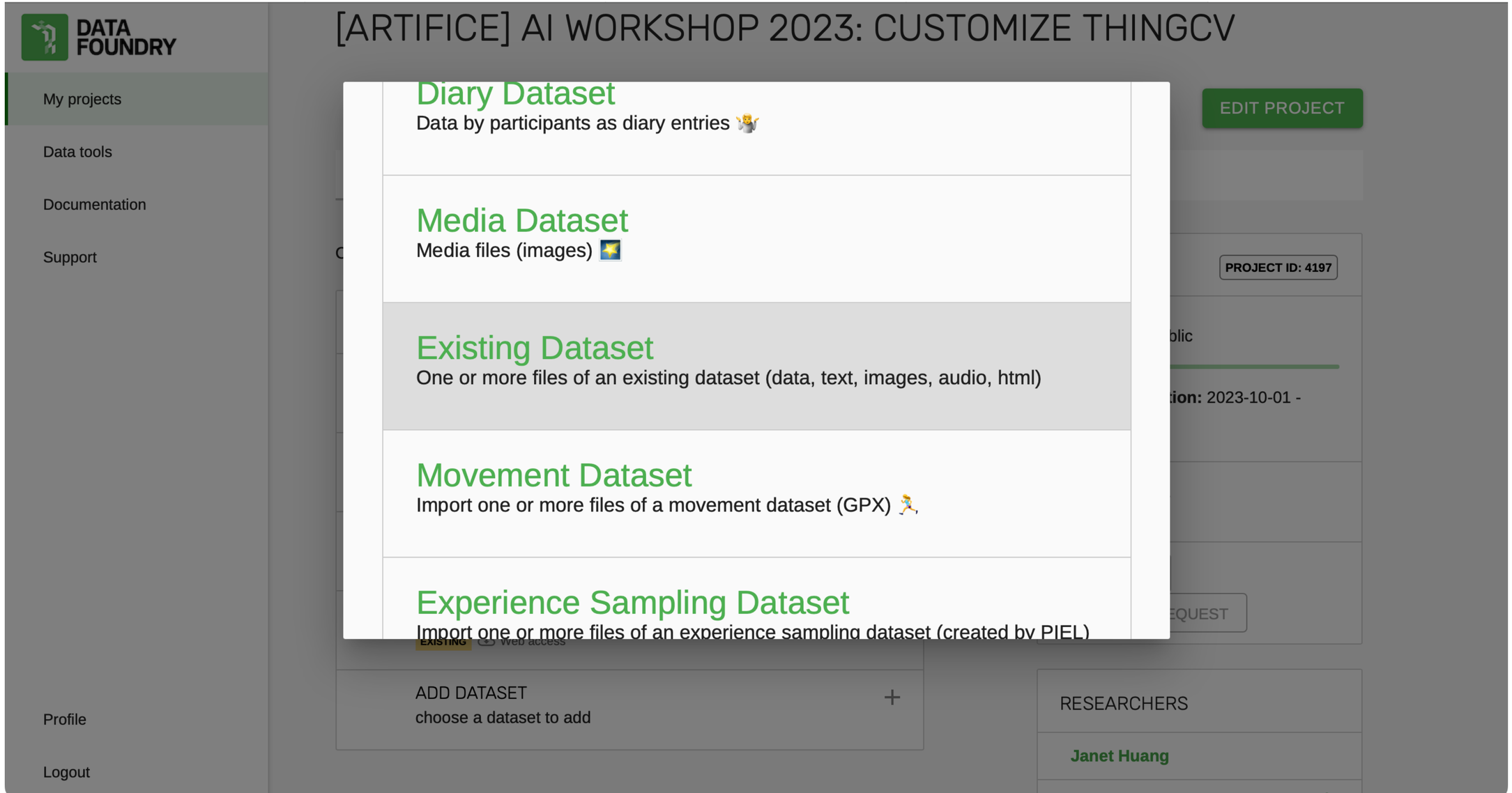
existing dataset

3

Use DF to host your website that includes a data visualization

Session II-(3) : Data Visualizer

Data Foundry: Existing Dataset



Home > [ARTIFICE] AI Workshop 2023: Customize ThingCV > thingCV

THINGCV

EDIT DATASET

visualization for thingCV

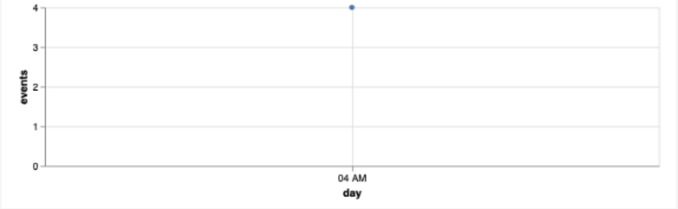
INFO ID: 9332

Type: EXISTING

Visibility: Public

Dataset activity: 2023-10-01 - 2024-02-29

License: MIT



VIEW DATA TABLE

DOWNLOAD DATA

UPLOAD FILE(S)

1

2 TASET FILES

File name	Description	Uploaded	
object_graph.json (open in tab)	thingCV	Oct 02 at 16:58	download | edit | delete
jLouvain.js (open in tab)	thingCV	Oct 02 at 16:58	download | edit | delete
jsnetworkx.js (open in tab)	thingCV	Oct 02 at 16:58	download | edit | delete
index.html (open in tab)	thingCV	Oct 02 at 16:58	download | edit | delete

CONFIGURATION

3

CSV/JSON TOKEN LINK | WEB-ACCESS | OOCSI STREAM

Access the data as a website

As the *research team*, you can always access the dataset as a website, if the dataset is active. (This is independent from public accessibility.)

This dataset is accessible as a public website with the following link:

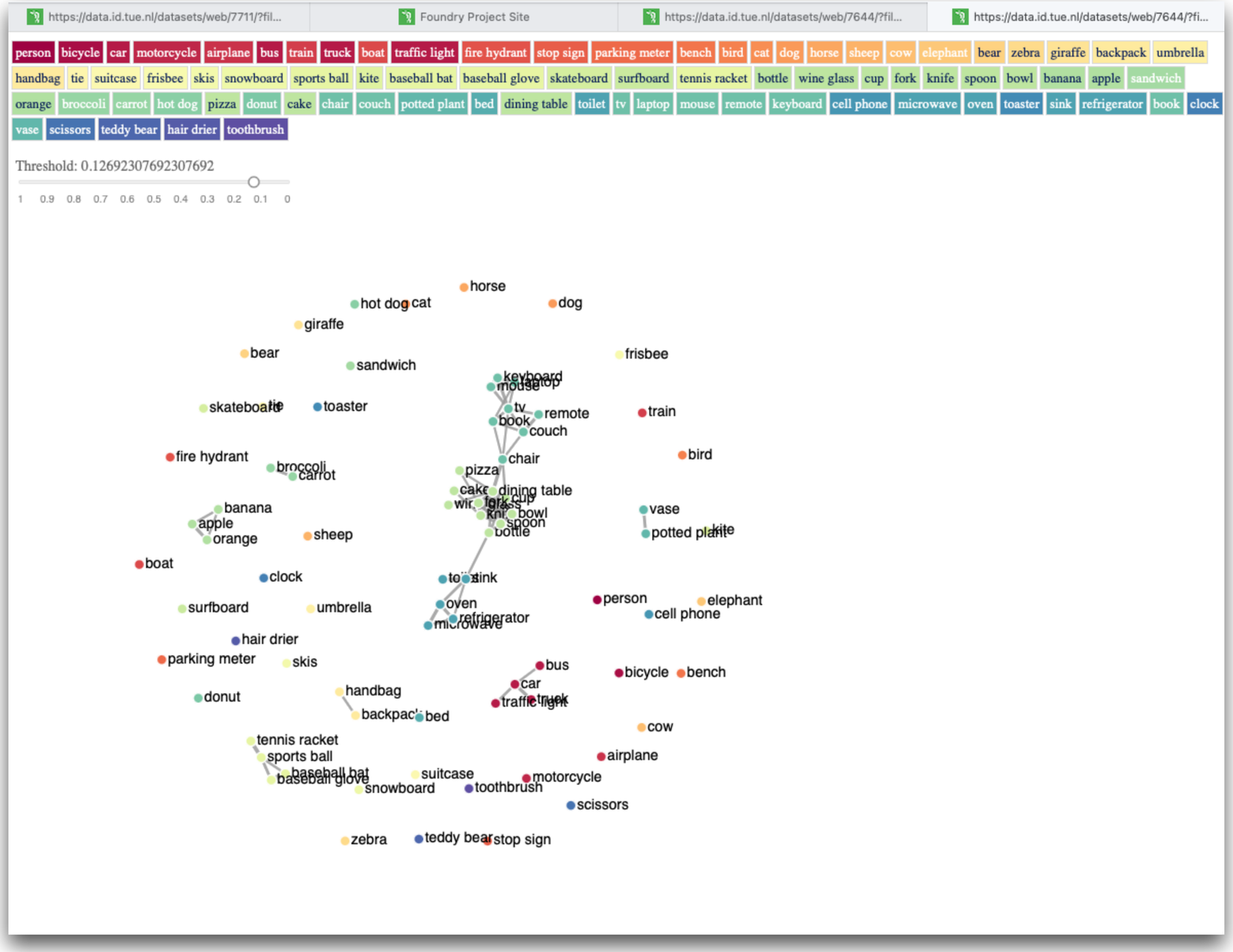
5

`https://data.id.tue.nl/web/elZBQWxRd1F5UDN3N1ExRHhkY0VqZ1JCV2FCVThUbG1QZ2htRWxqTm9uTT0=`

ACTIVATE WEB ACCESS

DISABLE WEB ACCESS

4



Data visualizer

- use DF existing dataset
- input data

object_graph.json (open in tab)

- source code

jLouvain.js (open in tab)
jsnetworkx.js (open in tab)
index.html (open in tab)

https://data.id.tue.nl/web/elZBQWxRd1F5UDN3N1ExRHhkY0VqZ1JCV2FCVThUbG1QZ2htRWxqTm9uTT0=

1

DATA FOUNDRY

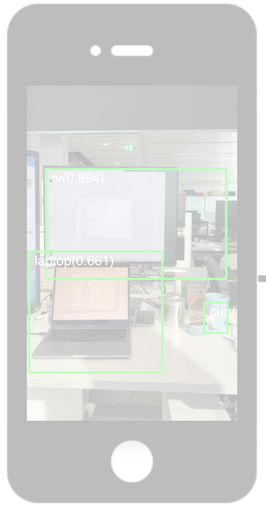
existing dataset

p5.js

ml5

Use DF to host your website that includes an object detector using a pre-trained model

80 everyday objects



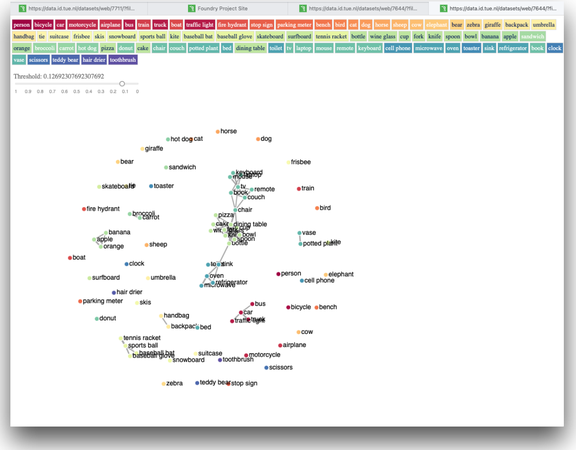
Object Detector

2

DATA FOUNDRY

IoT dataset

Use DF to store object data collected from your object detector



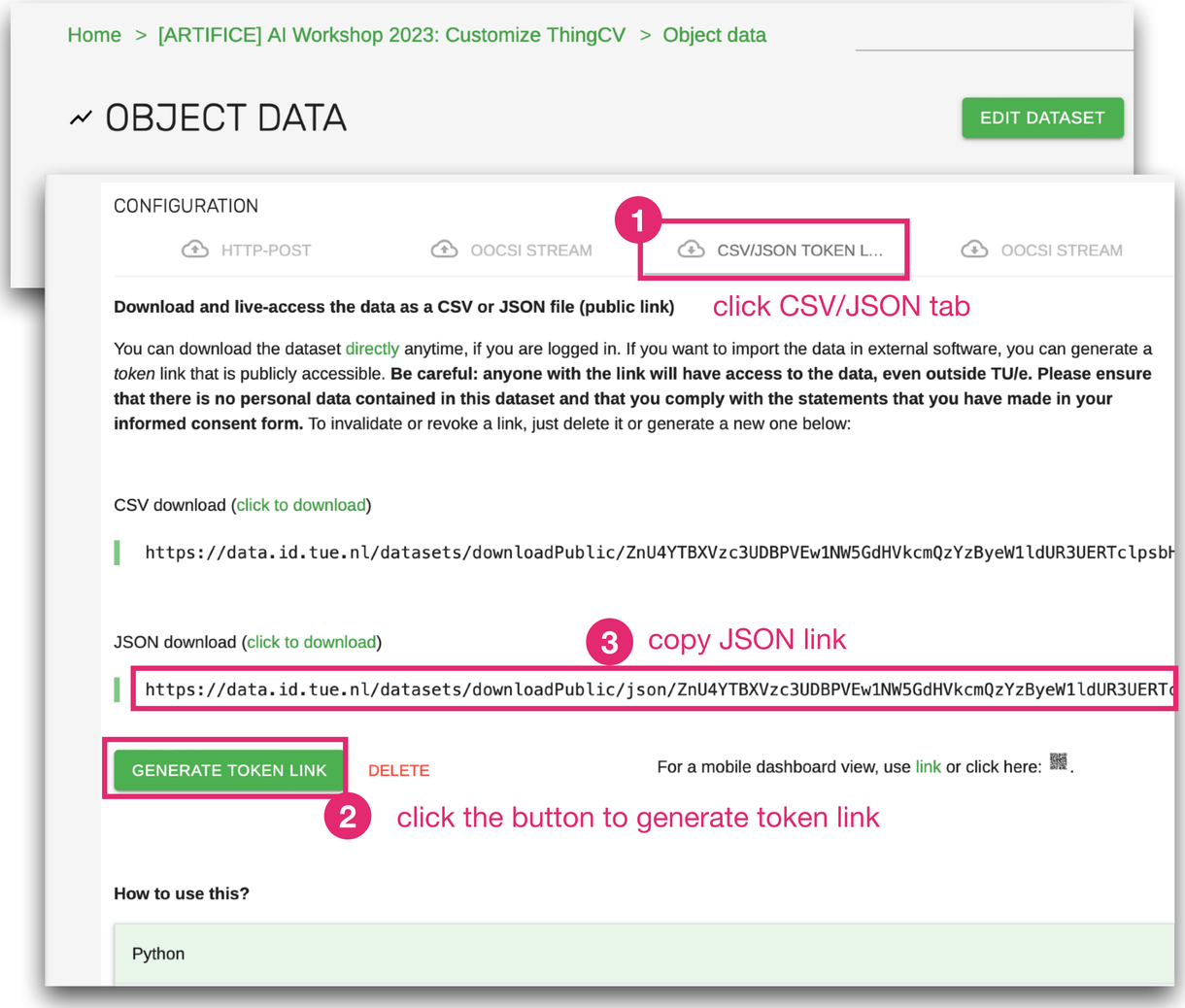
DATA FOUNDRY

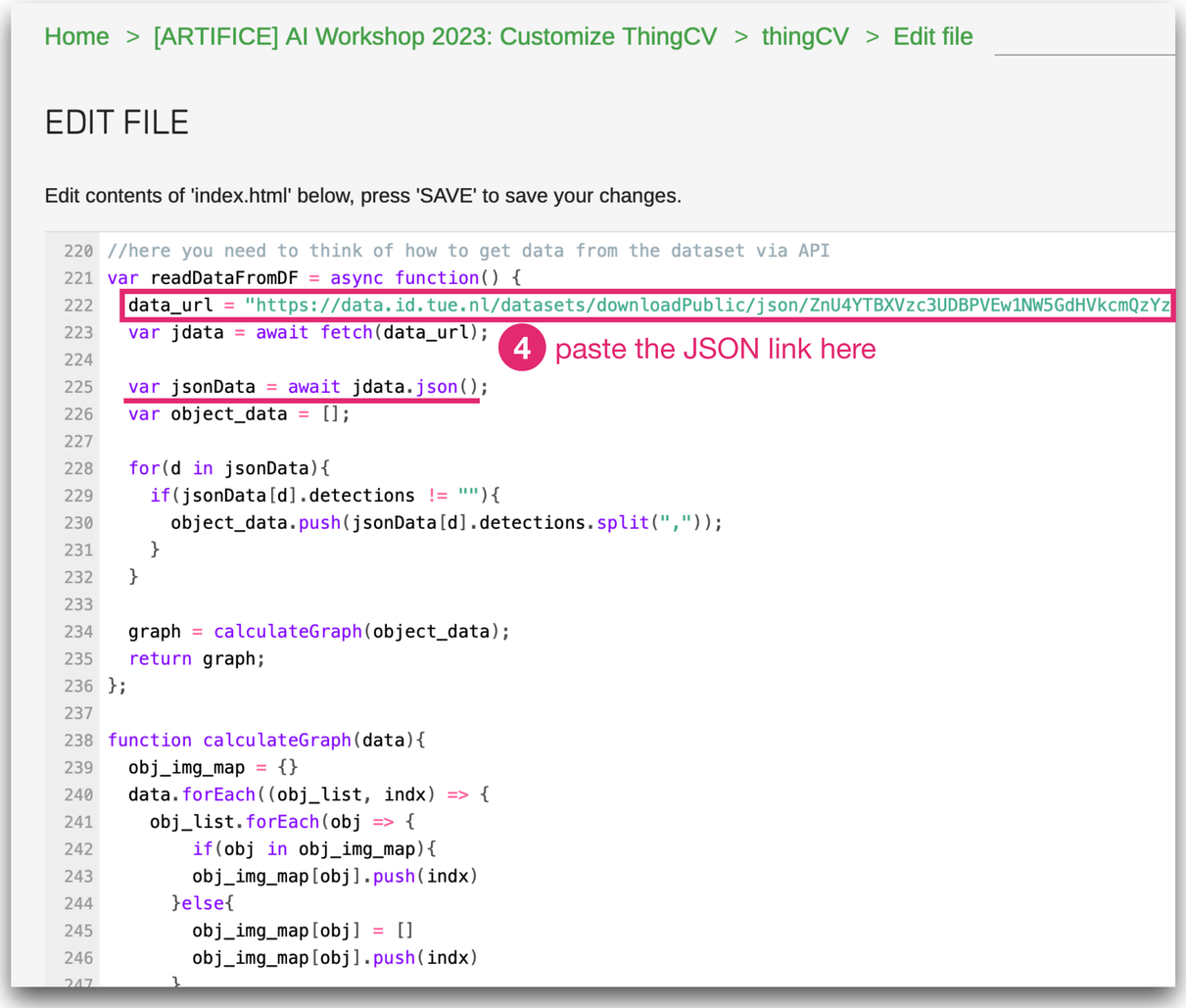
existing dataset

3

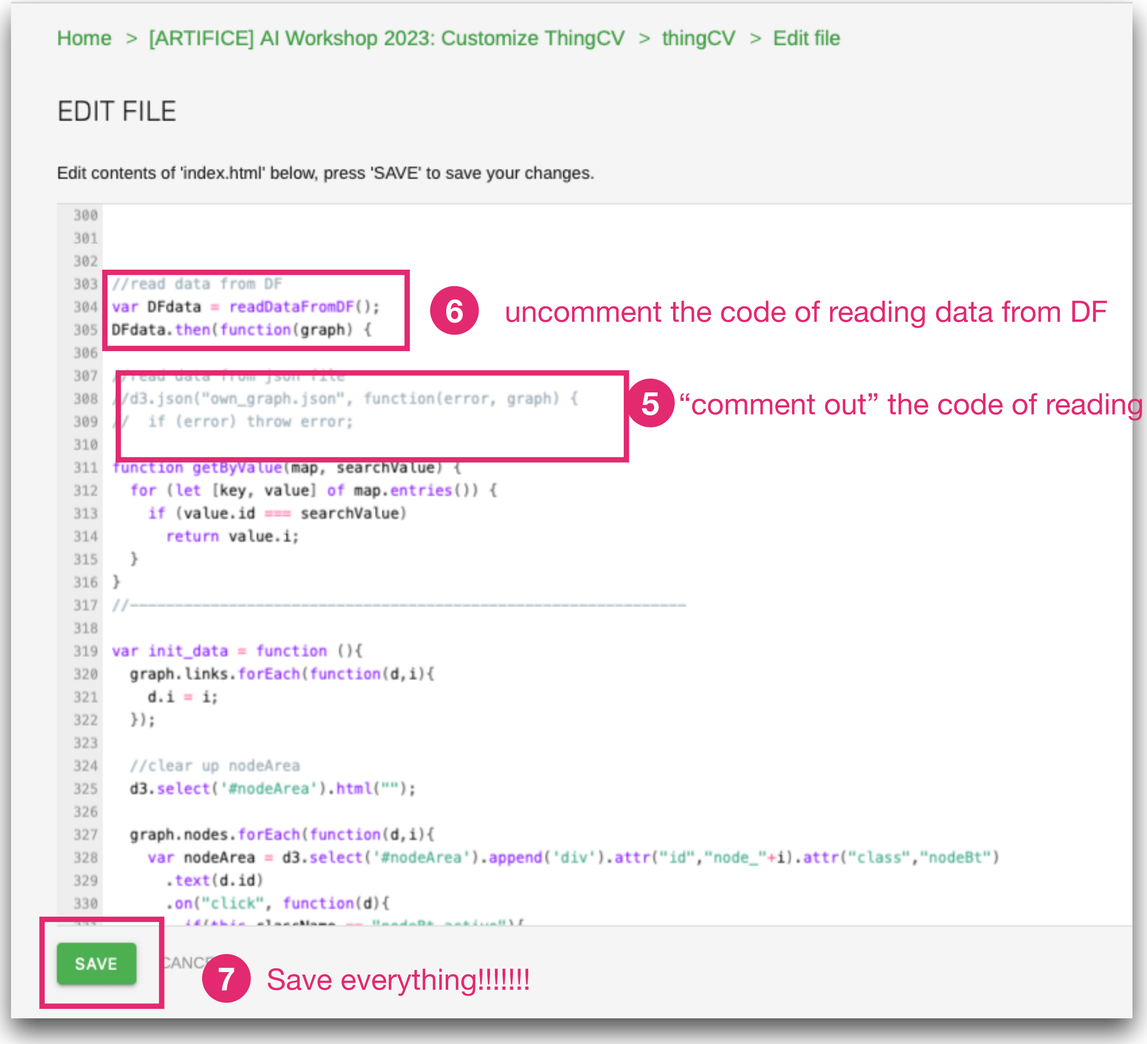
Use DF to host your website that includes a data visualization

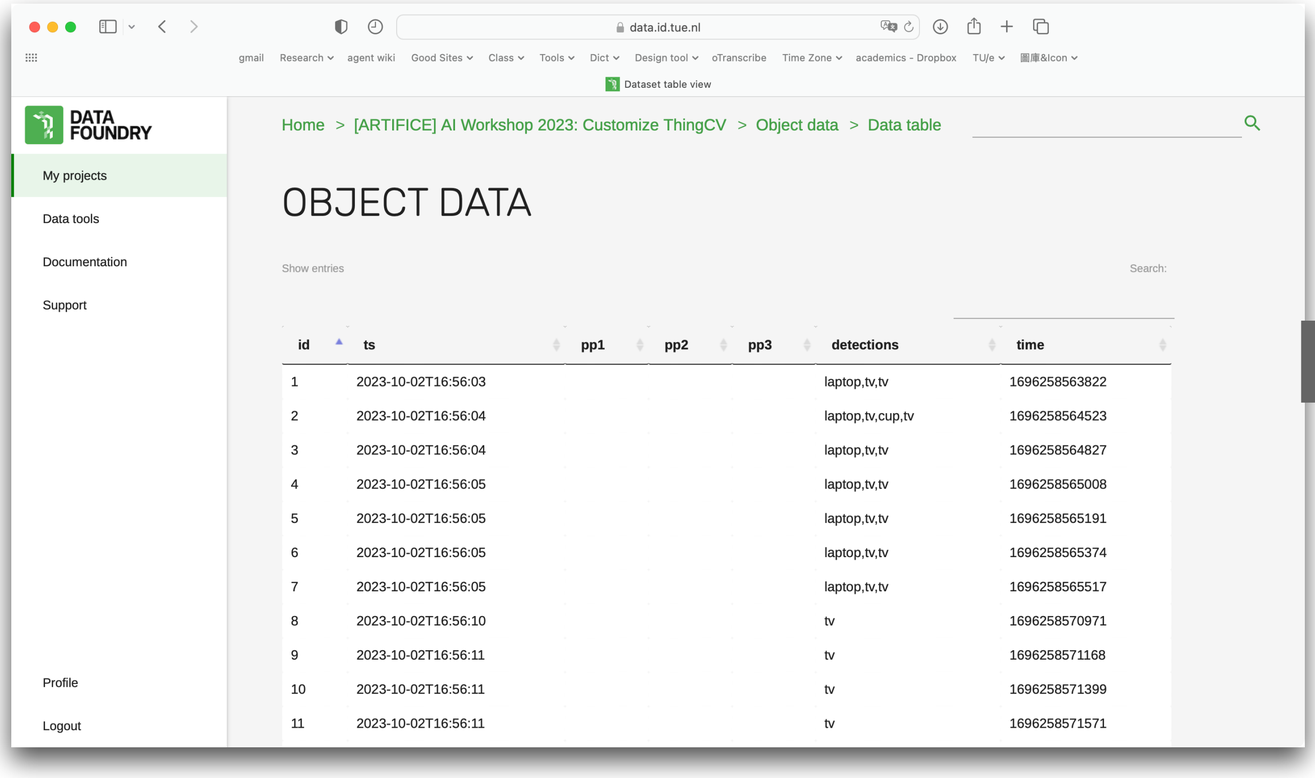
Make a connection between IoT dataset and web interface





Change input from reading a local JSON file to reading data from DF




data.id.tue.nl
gmail
Research
agent wiki
Good Sites
Class
Tools
Dict
Design tool
oTranscribe
Time Zone
academics - Dropbox
TU/e
圖庫&Icon
Dataset table view
DATA FOUNDRY
My projects
Data tools
Documentation
Support
Profile
Logout
Home > [ARTIFICE] AI Workshop 2023: Customize ThingCV > Object data > Data table
OBJECT DATA
Show entries
Search:
id
ts
pp1
pp2
pp3
detections
time
1 2023-10-02T16:56:03 laptop,tv,tv 1696258563822
2 2023-10-02T16:56:04 laptop,tv,cup,tv 1696258564523
3 2023-10-02T16:56:04 laptop,tv,tv 1696258564827
4 2023-10-02T16:56:05 laptop,tv,tv 1696258565008
5 2023-10-02T16:56:05 laptop,tv,tv 1696258565191
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7 2023-10-02T16:56:05 laptop,tv,tv 1696258565517
8 2023-10-02T16:56:10 tv 1696258570971
9 2023-10-02T16:56:11 tv 1696258571168
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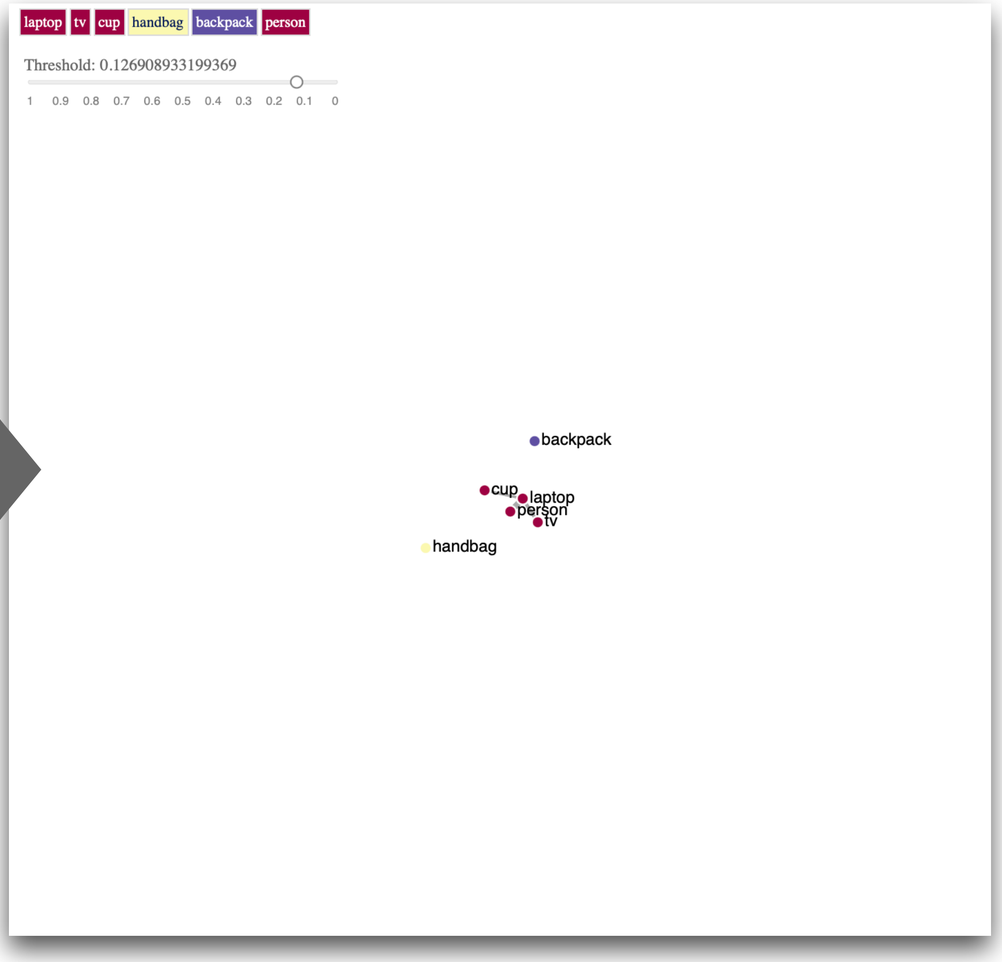

laptop
tv
cup
handbag
backpack
person
Threshold: 0.126908933199369
1 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 0
backpack
cup
laptop
person
tv
handbag

Exercise 4: Data Visualizer

Step 1: Create an existing dataset
Step 2: Download the source code and upload the code to the existing dataset
Step 3: Check whether the default data visualization is live through the website link

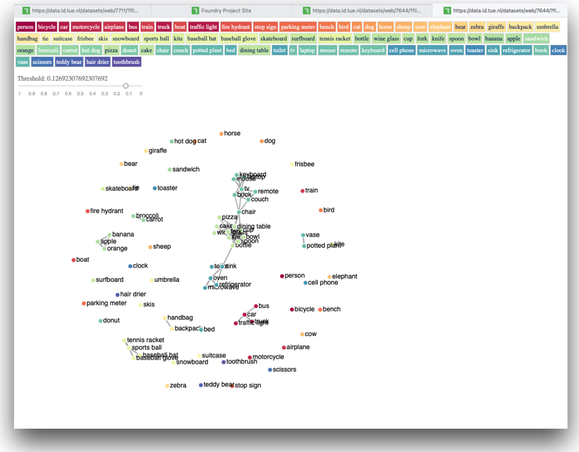
Step 4: Find and copy the data link (JSON link) under the object dataset
Step 5: change the code in “index.html” under data visualizer (in the existing dataset) and change input method (read input data from a json file to the JSON link)
Step 6: Check whether your data visualization that display the actual data stored from the IoT dataset (i.e., object data)

DATA FOUNDRY

existing dataset

DATA FOUNDRY

IoT dataset



Use DF to host your website that includes a data visualization

1

DATA FOUNDRY

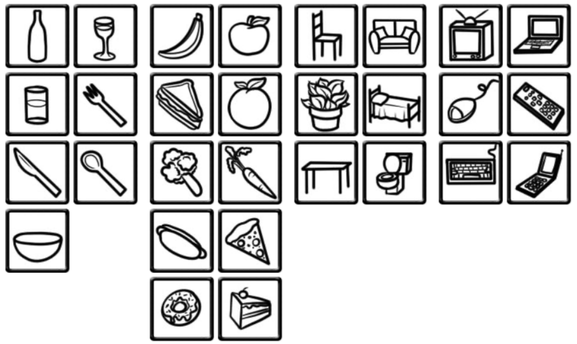
existing dataset

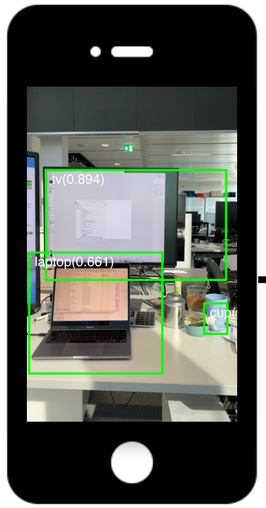
p5.js

ml5

Use DF to host your website that includes an object detector using a pre-trained model

80 everyday objects





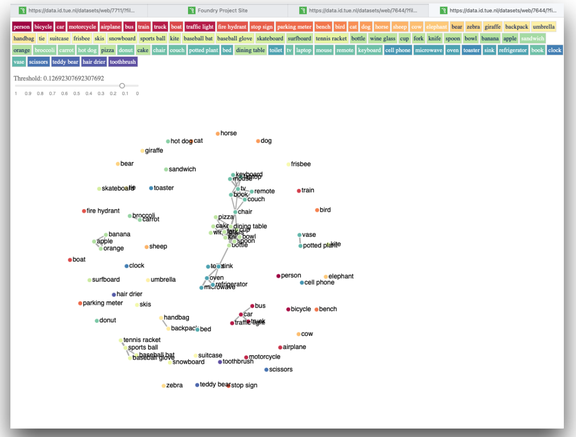
Object Detector

2

DATA FOUNDRY

IoT dataset

Use DF to store object data collected from your object detector



DATA FOUNDRY

existing dataset

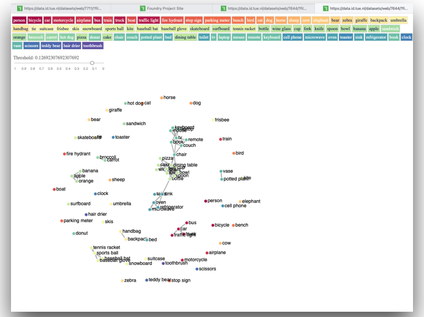
3

Use DF to host your website that includes a data visualization

Play with your own thingCV and celebrate! :)

Object Detector

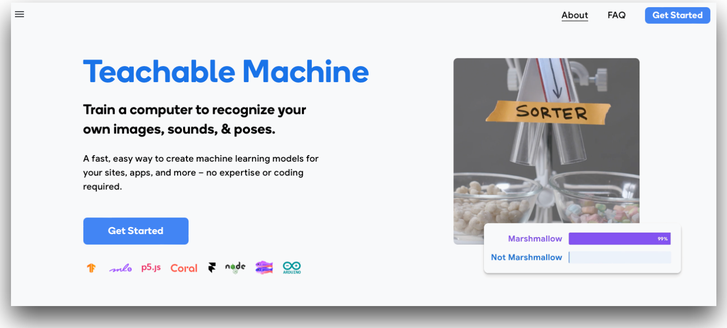
IoT dataset



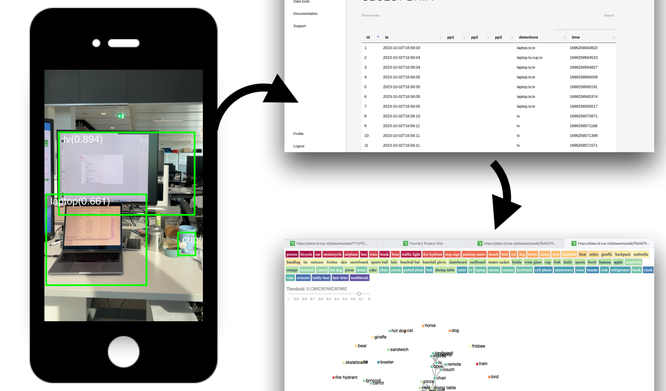
Data Visualizer

Recap

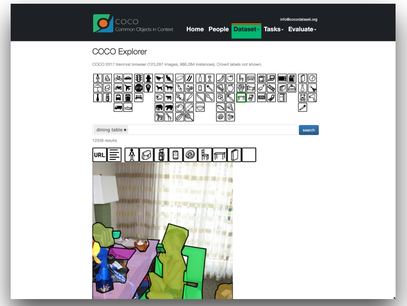
- use Teachable Machine to **train your own classifier**
- use MS-COCO dataset and thingCV to **support your design exploration**
- use AI canvas to **design the whole system**

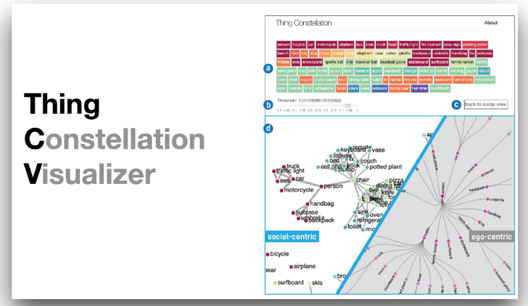


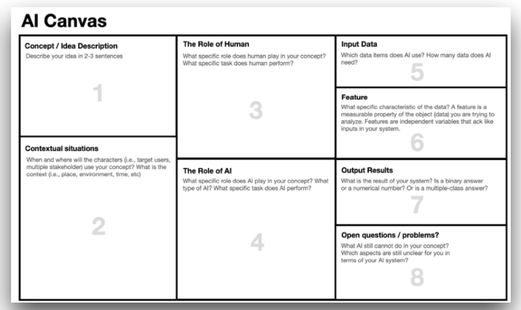
- use Data Foundry, p5.js and ml5.js to **build an entire system**
  - including object detector, data storage, and data visualization
- object detector
  - **build an object detector** using a pre-trained model (i.e., COCO-SD or YOLO)
  - host your object detector in DF
- data storage
  - use DF to **store your data** (i.e., AI-extracted data)
- data visualization
  - use DF to **host your interactive data visualization**



Object Detector







Q&A

Thank you!