

Liberdade e Inovação: como ferramentas livres vão guiar a sua jornada como Desenvolvedor e Cientista de Dados

Gabriela de Queiroz

@gdequeiroz | linktr.ee/gdq

slides: bit.ly/ibm-cloud-girls

Gabriela de Queiroz

Sr. Engineering and Data Science Manager, IBM

- Fundadora do R-Ladies (rladies.org)
- Fundadora do AI Inclusive (ai-inclusive.org)



- Graduação em Estatística (UERJ)
- Mestrado em Epidemiologia (ENSP/Fiocruz)
- Mestrado em Estatística (CSUEB)

Data Scientist + Developer Advocate + Open Source Developer + Manager +
Statistician + Epidemiologist + Community Builder + Mentor + Speaker + Educator



R-Ladies

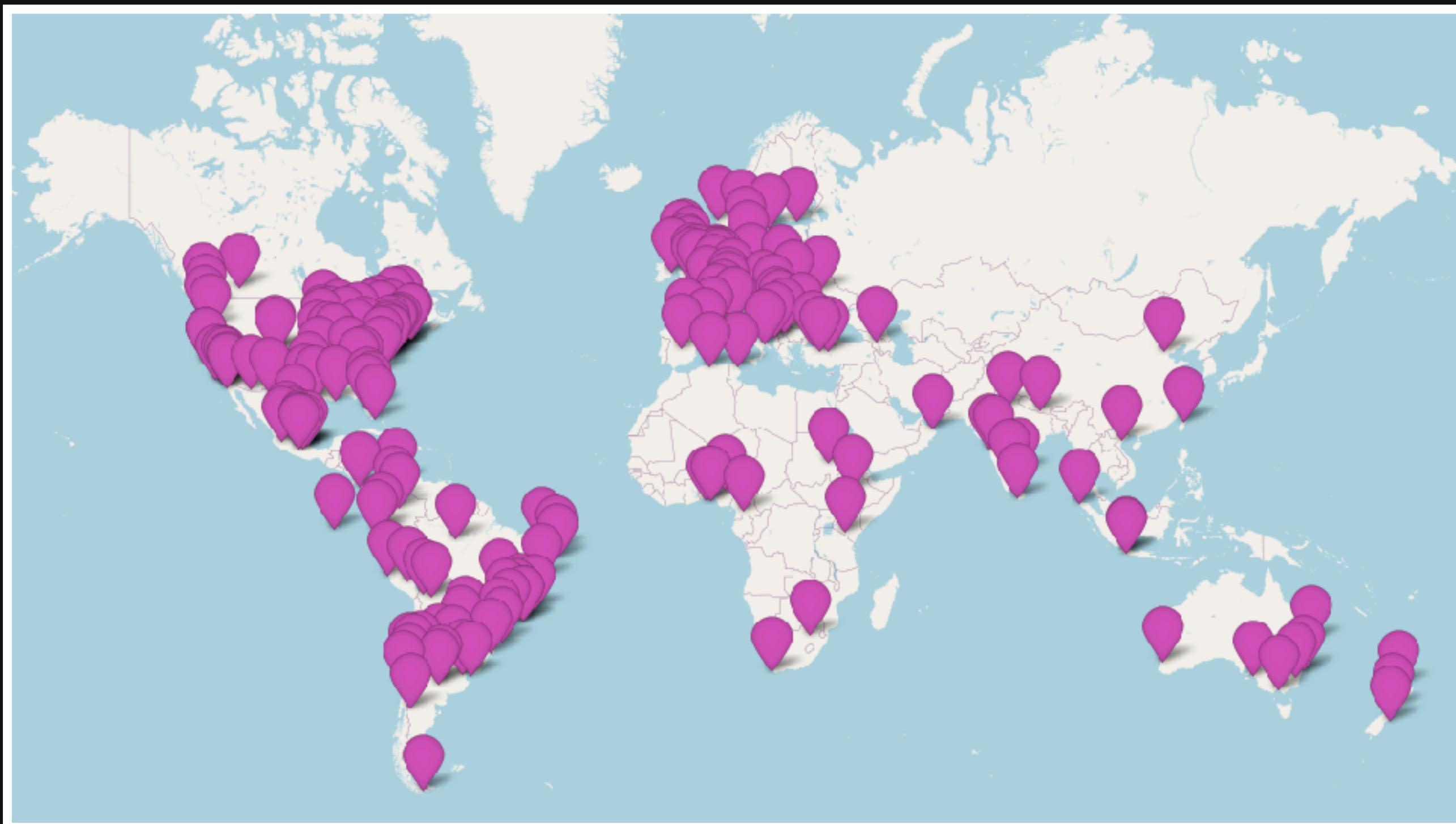
rladies.org

Worldwide organization that promotes

diversity in the R community via meetups

and mentorship in a friendly and safe

environment





AI Inclusive

Together, we are building a community to make **AI** more **inclusive** to everyone.

Missão: Aumentar a **representatividade** e **participação** de minorias em Inteligência Artificial

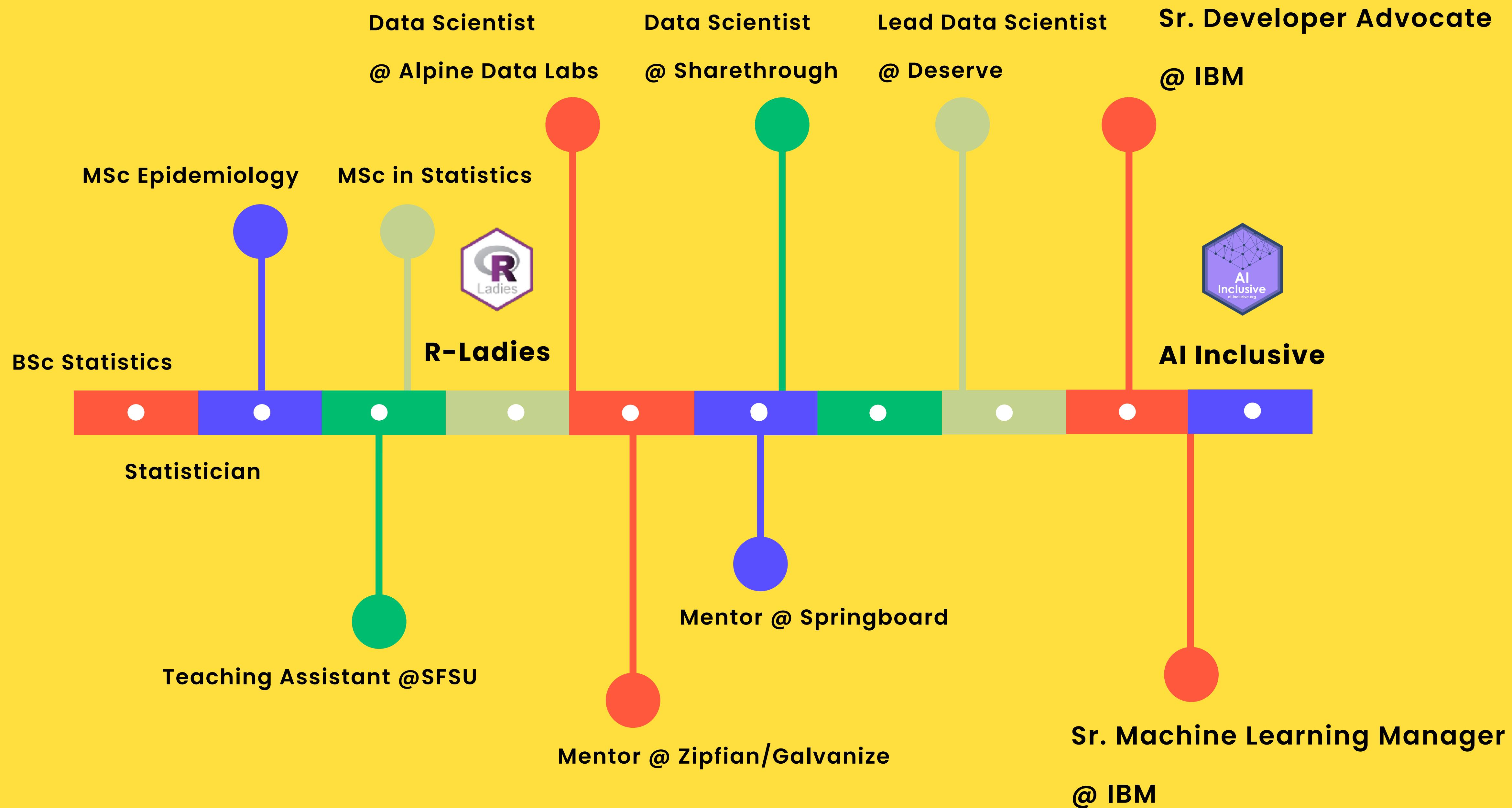
- Website: ai-inclusive.org
- Twitter: bit.ly/ai-inclusive-twitter
- Facebook: bit.ly/ai-inclusive-facebook
- Instagram: bit.ly/ai-inclusive-instagram
- Youtube: bit.ly/ai-inclusive-youtube

Capítulos no Rio de Janeiro, Salvador e em San Francisco (EUA)

Se tiver interesse em criar um capítulo, é só enviar um email: info@ai-inclusive.org



COMO FOI A SUA TRAJETÓRIA ATÉ
CHEGAR À IBM?

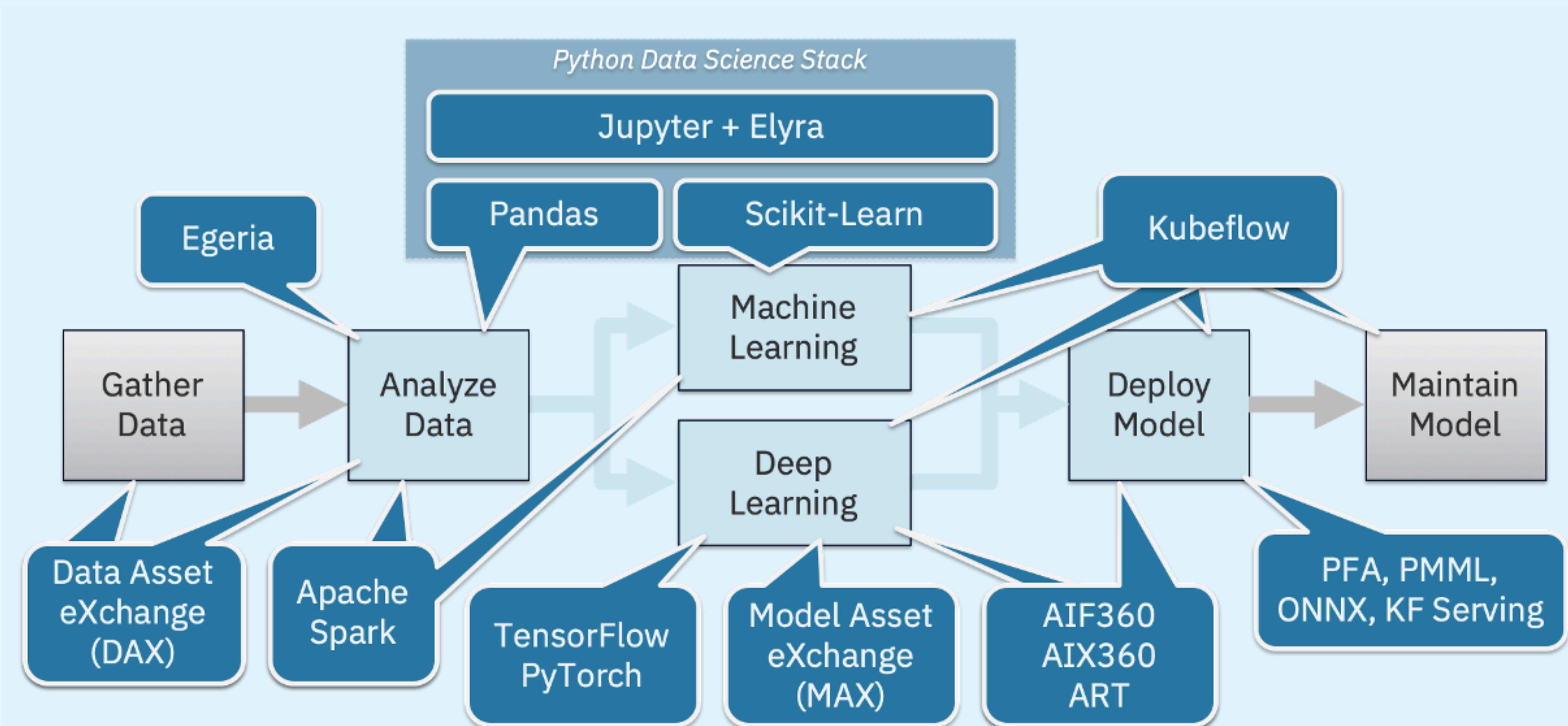


Welcome to IBM

2018

We build tools to make AI accessible and available to everybody

(codait.org)



We contribute to and advocate for the open-source technologies

Model Asset eXchange

Model Asset eXchange

Free, deployable, and trainable code. A place for developers to find and use free and open source deep learning models.

Try the tutorial →
Join the community →

Featured Deployable Trainable

Model Deployable Toxic Comment Classifier Detect 6 types of toxicity in user comments Jun 04, 2019 →	Model Deployable, Trainable Text Sentiment Classifier Detect the sentiment captured in short pieces of text Mar 29, 2019 →	Model Deployable, Trainable Image Segmenter Identify objects in an image, additionally assigning each pixel of the image to a particular object. Sep 21, 2018 →
Model Deployable, Trainable Object Detector Localize and identify multiple objects in a single image. Sep 21, 2018 →	Model Deployable Audio Classifier Identify sounds in short audio clips. Sep 21, 2018 →	Model Deployable Image Caption Generator Generate captions that describe the contents of images. Sep 21, 2018 →

Data Asset eXchange

Data Asset eXchange

Explore useful and relevant data sets for enterprise data science

Learn More →
What's New →
Get Involved →

Dataset CSV NOAA Weather Data - JFK Airport June 30, 2020 →	Dataset IOB format Groningen Meaning Bank - Modified May 14, 2020 →	Dataset CSV Fashion-MNIST September 12, 2019 →
Dataset JPG, JSON PubLayNet October 25, 2019 →	Dataset WAV TensorFlow Speech Commands March 17, 2020 →	Dataset PNG, JSON PubTabNet July 20, 2020 →

ibm.biz/model-exchange

ibm.biz/data-exchange

Model Asset eXchange

Place for developers/data scientists to find and use
free and **open source** deep learning models

ibm.biz/model-exchange

Model Asset eXchange

[Try the tutorial](#)



[Join the community](#)



Free, deployable, and trainable code. A place for developers to find and use free and open source deep learning models.

[Featured](#) [Deployable](#) [Trainable](#)

Model | Deployable

Toxic Comment Classifier

Detect 6 types of toxicity in user comments

Jun 04, 2019

Model | Deployable, Trainable

Text Sentiment Classifier

Detect the sentiment captured in short pieces of text

Mar 29, 2019

Model | Deployable, Trainable

Image SegmenTer

Identify objects in an image, additionally assigning each pixel of the image to a particular object.

Sep 21, 2018

Model | Deployable, Trainable

Object Detector

Localize and identify multiple objects in a single image.

Sep 21, 2018

Model | Deployable

Audio Classifier

Identify sounds in short audio clips.

Sep 21, 2018

Model | Deployable

Image Caption Generator

Generate captions that describe the contents of images.

Sep 21, 2018

[View all models](#)

Model Deployable, Trainable Question Answering Answer questions on a given corpus of text Sep 17, 2019 →	Model Deployable Text Summarizer Generate a summarized description of a body of text Jul 09, 2019 →	Model Deployable Toxic Comment Classifier Detect 6 types of toxicity in user comments Jun 04, 2019 →	Model Deployable Image Colorizer Adds color to black and white images. Sep 21, 2018 →	Model Deployable, Trainable Image Segmenter Identify objects in an image, additionally assigning each pixel of the image to a particular object. Sep 21, 2018 →	Model Deployable Image Classifier - Inception ResNet v2 Identify objects in images using a third-generation deep residual network. Sep 21, 2018 →
Model Deployable Chinese Phonetic Similarity Estimator Estimate the phonetic distance between Chinese words and get similar sounding candidate words. May 28, 2019 →	Model Deployable Image Resolution Enhancer Upscale an image by a factor of 4, while generating photo-realistic details. Mar 29, 2019 →	Model Deployable, Trainable Text Sentiment Classifier Detect the sentiment captured in short pieces of text Mar 29, 2019 →	Model Deployable News Text Generator Generate English-language text similar to the news articles in the One Billion Words data set. Sep 21, 2018 →	Model Deployable, Trainable Object Detector Locate and identify multiple objects in a single image. Sep 21, 2018 →	Model Deployable, Trainable Image Classifier - ResNet50 Identify objects in Images using a first-generation deep residual network. Sep 21, 2018 →
Model Deployable Nucleus Segmenter Identify nuclei in a microscopy image and assign each pixel of the image to a particular nucleus. Mar 28, 2019 →	Model Deployable Speech to Text Converter Converts spoken words into text form. Mar 27, 2019 →	Model Deployable Human Pose Estimator Detect humans in an image and estimate the pose for each person. Dec 12, 2018 →	Model Deployable Review Text Generator Generate English-language text similar to the text in the Yelp® review data set. Sep 21, 2018 →	Model Deployable Scene Classifier Classify images according to the place/location labels in the Places365 data set. Sep 21, 2018 →	Model Deployable Sports Video Classifier Classify sporting activities in videos. Sep 21, 2018 →
Model Deployable, Trainable Named Entity Tagger Locate and tag named entities in text. Oct 31, 2018 →	Model Deployable Fast Neural Style Transfer Generate a new image that mixes the content of a source image with the style of another image. Sep 21, 2018 →	Model Deployable Image Caption Generator Generate captions that describe the contents of images. Sep 21, 2018 →	Model Deployable Weather Forecaster Predict hourly weather features given historical data for a specific location Sep 21, 2018 →	Model Trainable Word Embedding Generator Generates word embedding vectors from text files. Sep 21, 2018 →	Model Deployable Audio Classifier Identify sounds in short audio clips. Sep 21, 2018 →

30 ready to use deep learning models

Model Asset eXchange (MAX)

- Wide variety of domains (text, audio, image, etc)
- Multiple deep learning frameworks (TensorFlow, PyTorch, Keras)
- **Trainable** and **Deployable** versions

The screenshot shows the homepage of the Model Asset eXchange (MAX) website. At the top right, there are two buttons: "Try the tutorial" (blue background) and "Join the community" (grey background). Below the header, a main text area states: "Free, deployable, and trainable code. A place for developers to find and use free and open source deep learning models." Underneath this, there are six model cards arranged in a grid. Each card includes a title, a brief description, and a date. The cards are:

- Toxic Comment Classifier**: Model | Deployable. Detect 6 types of toxicity in user comments. Jun 04, 2019.
- Text Sentiment Classifier**: Model | Deployable, Trainable. Detect the sentiment captured in short pieces of text. Mar 29, 2019.
- Image Segmenter**: Model | Deployable, Trainable. Identify objects in an image, additionally assigning each pixel of the image to a particular object. Sep 21, 2018.
- Object Detector**: Model | Deployable, Trainable. Localize and identify multiple objects in a single image. Sep 21, 2018.
- Audio Classifier**: Model | Deployable. Identify sounds in short audio clips. Sep 21, 2018.
- Image Caption Generator**: Model | Deployable. Generate captions that describe the contents of images. Sep 21, 2018.

At the bottom right of the page is a blue button labeled "View all models".

Model Asset eXchange

Try the tutorial →

Join the community →

Free, deployable, and trainable code. A place for developers to find and use free and open source deep learning models.

Featured Deployable Trainable

Model | Deployable

Toxic Comment Classifier

Detect 6 types of toxicity in user comments

Jun 04, 2019 →

Model | Deployable, Trainable

Text Sentiment Classifier

Detect the sentiment captured in short pieces of text

Mar 29, 2019 →

Model | Deployable, Trainable

Image Segmenter

Identify objects in an image, additionally assigning each pixel of the image to a particular object.

Sep 21, 2018 →

Model | Deployable, Trainable

Object Detector

Localize and identify multiple objects in a single image.

Sep 21, 2018 →

Model | Deployable

Audio Classifier

Identify sounds in short audio clips.

Sep 21, 2018 →

Model | Deployable

Image Caption Generator

Generate captions that describe the contents of images.

Sep 21, 2018 →

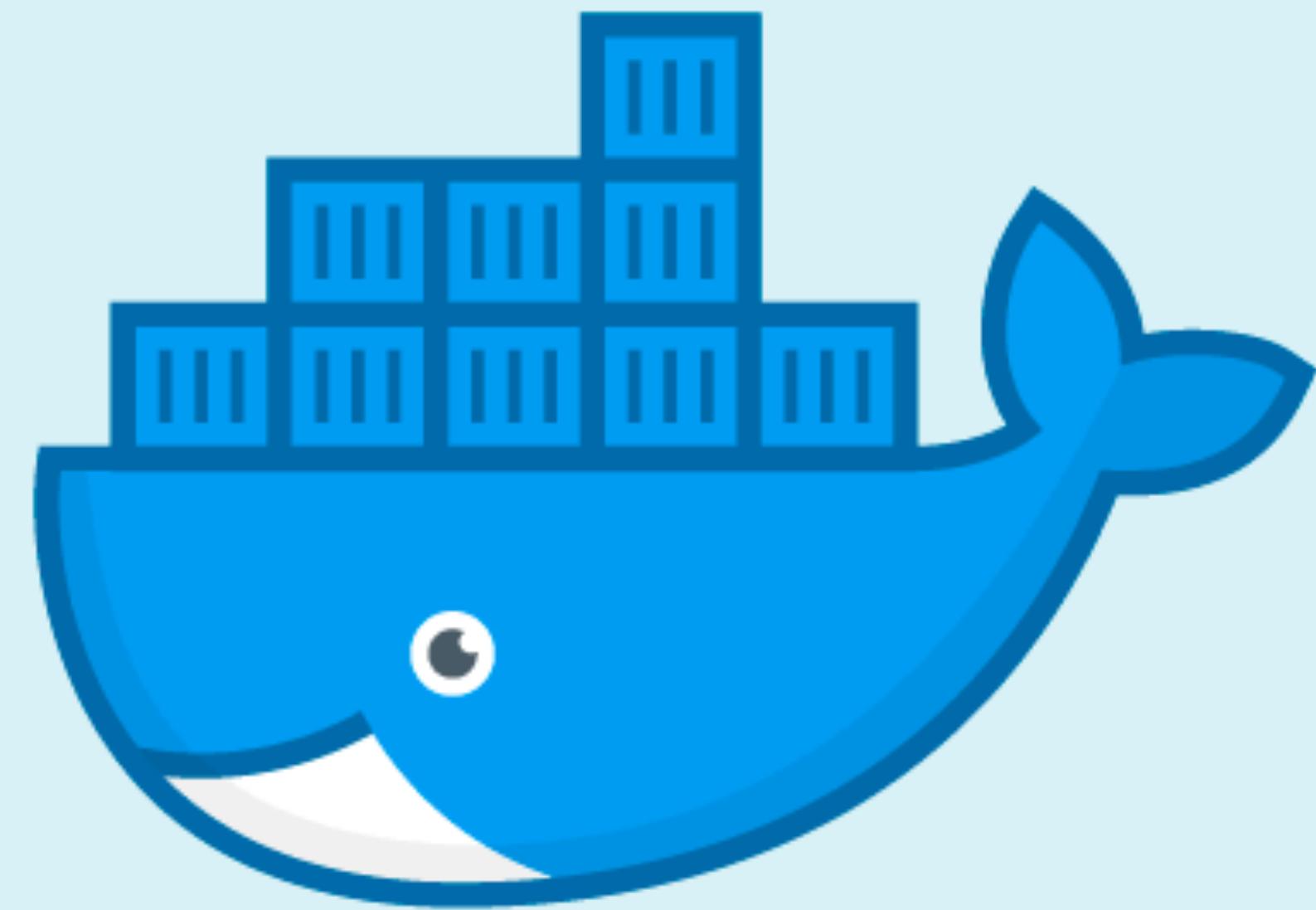
View all models

ibm.biz/model-exchange

What do I need to get started?

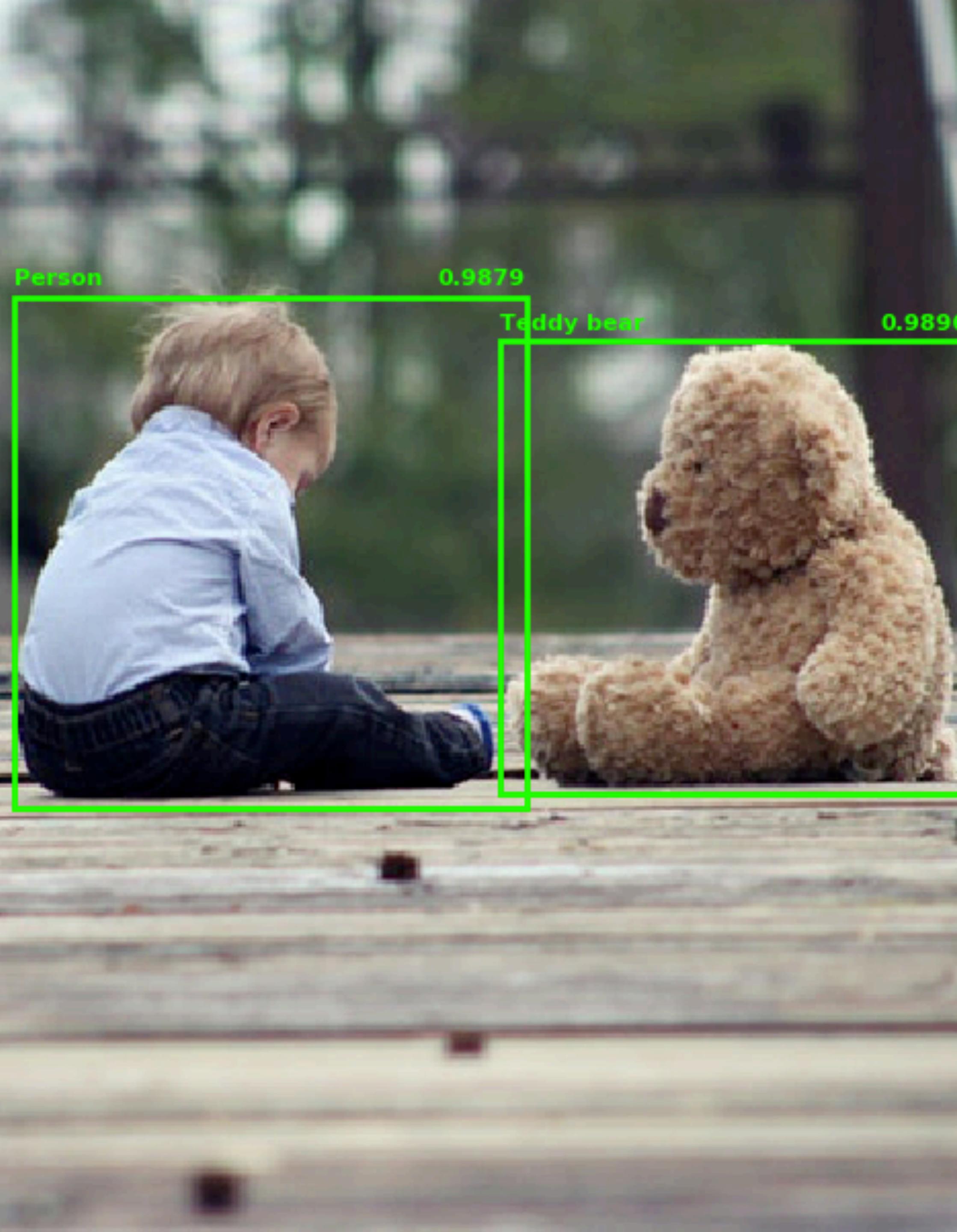


START
HERE.



docker

<https://www.docker.com>



OBJECT DETECTOR

Localize and identify multiple objects in a single image

Model Asset eXchange

Free, deployable, and trainable code. A place for developers to find and use free and open source deep learning models.

Try the tutorial →
Join the community →

Featured Deployable Trainable

Model | Deployable

Toxic Comment Classifier

Detect 6 types of toxicity in user comments

Jun 04, 2019 →

Model | Deployable, Trainable

Text Sentiment Classifier

Detect the sentiment captured in short pieces of text

Mar 29, 2019 →

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Image Segmente

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Sep 21, 2018 →

Model | Deployable, Trainable

Audio Classifier

Identify sounds in short audio clips.

Sep 21, 2018 →

Model | Deployable

Image Caption Generator

Generate captions that describe the contents of images.

Sep 21, 2018 →

ibm.biz/model-exchange

Model Deployable, Trainable

Object Detector

Localize and identify multiple objects in a single image.

Get this model



Try the API →

Try the web app →

Try in a Node-RED flow →

Object Detector

Localize and identify multiple objects in a single image.

Get this model



Try the API



Try the web app



Try in a Node-RED flow



IBM / MAX-Object-Detector

Watch

37

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Fork

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Code

Issues 6

Pull requests

Actions

Projects

Security

Insights

master ▾

Go to file

Code ▾

About

Localize and identify multiple objects in a single image.

[🔗 developer.ibm.com/exchange...](https://developer.ibm.com/exchange/)

docker-image

machine-learning

machine-learning-models

coco-dataset

tensorflow-model

Readme

Apache-2.0 License

Deployment options

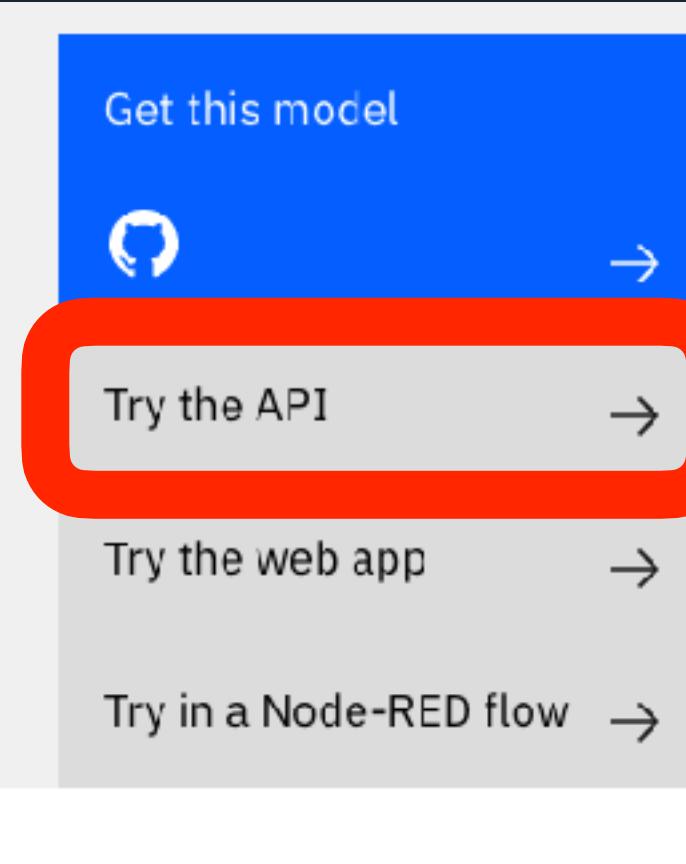
- [Deploy from Docker Hub](#)
- [Deploy on Red Hat OpenShift](#)
- [Deploy on Kubernetes](#)
- [Run Locally](#)

Access the API via Python

Model | Deployable, Trainable

Object Detector

Localize and identify multiple objects in a single image.

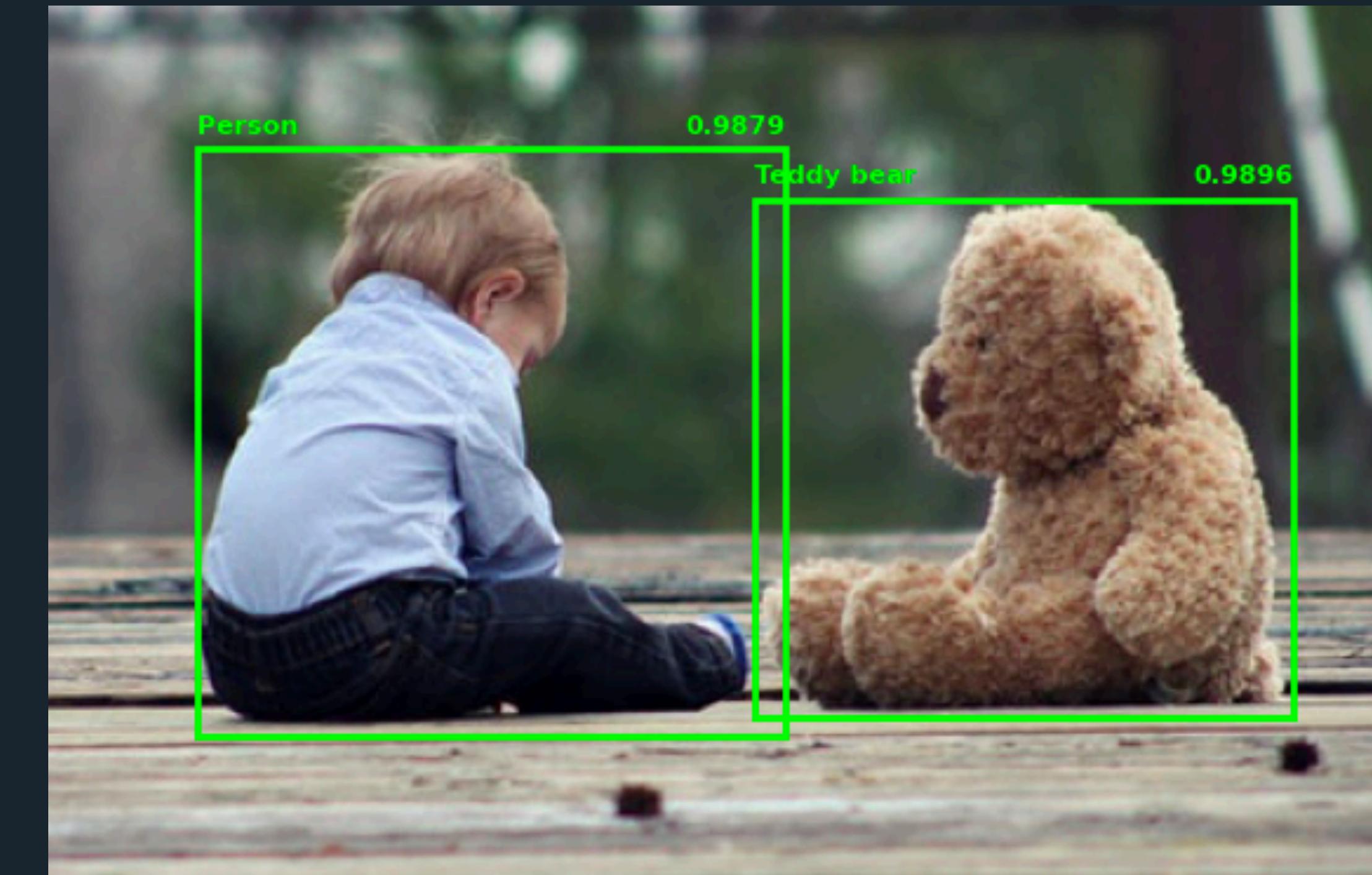


```
# Model
url = 'http://max-object-detector.codait-prod-41208c73af8fca213512856c7a09
db52-0000.us-east.containers.appdomain.cloud/'
model_endpoint = 'model/predict'
complete_url = url + model_endpoint

# Upload an image to the MAX model's rest API
path_to_input_image = 'baby-bear.jpg'

with open(path_to_input_image, 'rb') as file:
    file_form = {'image': (path_to_input_image, file, 'image/jpeg')}
    # Post the image to the rest API using the requests library
    r = requests.post(url=complete_url, files=file_form)
    # Return the JSON
    response = r.json()

IPython.display.Image(path_to_input_image, width = 450)
```



Try yourself here:
ibm.biz/max-notebook

Let's try together ...

1) Go to ibm.biz/gg university and create an account

2) Login to your account and create a project

The screenshot shows the 'Overview' section of the IBM Watson Studio interface. It includes three main cards:

- Recent projects:** Shows a message: "No recent projects. After you create projects, you'll see your recently updated projects here." with a "New project" button.
- Recent catalogs:** Shows a message: "No catalogs. Your catalogs show here after you create or join them. Click New catalog to get started." with a "New catalog" button.
- Notifications:** Shows a message: "No notifications. You will see your most recent notifications here."

3) Create an *empty project*

The screenshot shows a modal dialog titled "Create an empty project". It contains the following text:

Create an empty project
Add the data you want to prepare, analyze, or model. Choose tools based on how you want to work: write code, create a flow on a graphical canvas, or automatically build models.

NEW AutoAI experiment tool: Fully automated approach to building a classification or reg...

4) Go to the link ibm.biz/max-notebook and copy the project

The screenshot shows a project details page with the following information:

Version author	Language	Date
Gabriela de Queiroz	Python 3.6	Jun 16, 2020, 9:03 AM

A "Copy to project" button is visible on the right side of the page.

5) Change the select runtime

The screenshot shows a "Select runtime" dropdown menu with the following options listed:

- ✓ Default Python 3.7 XXS (1 vCPU 4 GB RAM)
- Default Python 3.7 XS + DO (2 vCPU 8 GB RAM)
- Default Python 3.6 XS + DO (2 vCPU 8 GB RAM)
- Default Python 3.7 XS (2 vCPU 8 GB RAM)
- Default Python 3.6 XS (2 vCPU 8 GB RAM)
- Default R 3.6 S (4 vCPU 16 GB RAM)
- Default Python 3.7 S (4 vCPU 16 GB RAM)
- Default Python 3.6 S (4 vCPU 16 GB RAM)
- Default Spark 3.0 & Scala 2.12 (Driver: 1 vCPU 4 GB RAM, 2 Executors: 1 vCPU 4 GB RAM)
- Default Spark 3.0 & R 3.6 (Driver: 1 vCPU 4 GB RAM, 2 Executors: 1 vCPU 4 GB RAM)
- Default Spark 3.0 & Python 3.7 (Driver: 1 vCPU 4 GB RAM, 2 Executors: 1 vCPU 4 GB RAM)
- Default Spark 2.4 & Scala 2.11 (Driver: 1 vCPU 4 GB RAM, 2 Executors: 1 vCPU 4 GB RAM)
- Default Spark 2.4 & R 3.6 (Driver: 1 vCPU 4 GB RAM, 2 Executors: 1 vCPU 4 GB RAM)
- Default Spark 2.4 & Python 3.7 (Driver: 1 vCPU 4 GB RAM, 2 Executors: 1 vCPU 4 GB RAM)
- Default Spark 2.4 & Python 3.6 (Driver: 1 vCPU 4 GB RAM, 2 Executors: 1 vCPU 4 GB RAM)



Now you can run the notebook!

Access the API via Swagger

Model | Deployable, Trainable

Object Detector

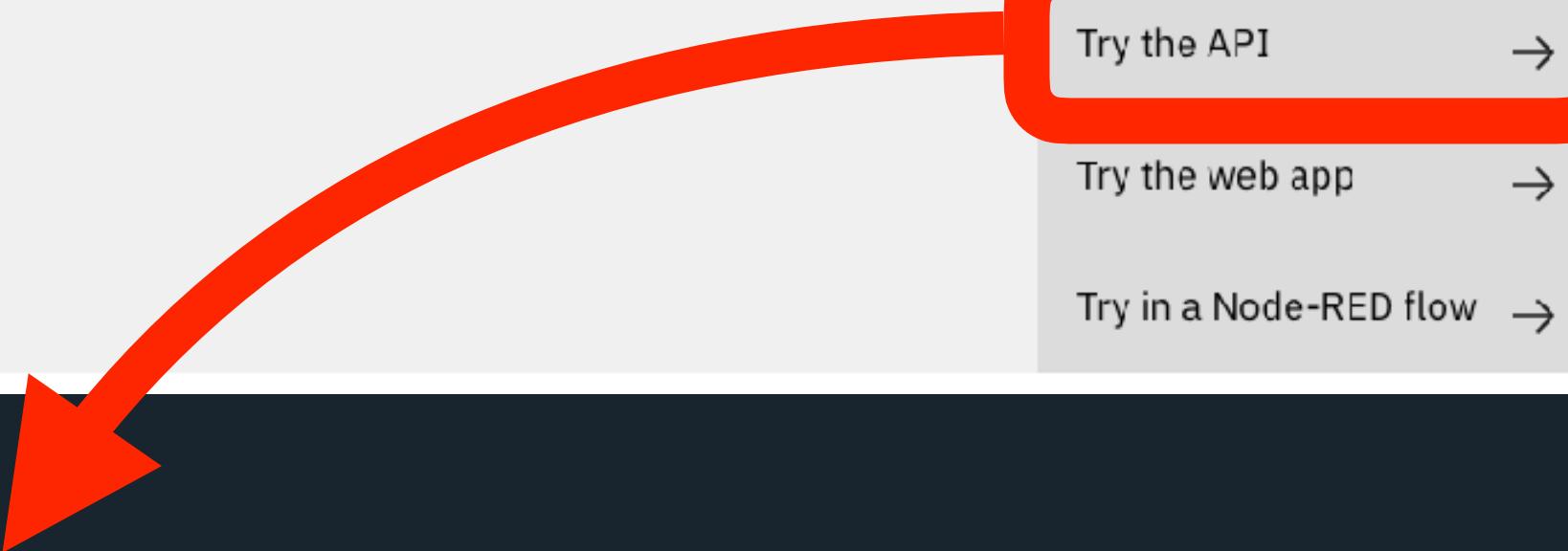
Localize and identify multiple objects in a single image.

Get this model →

Try the API → **Try the API**

Try the web app →

Try in a Node-RED flow →



POST /model/predict Make a prediction given input data

Parameters

Name	Description
image * required	An image file (encoded as PNG or JPG/JPEG)
file (formData)	<input type="button" value="Choose File"/> traffic.jpeg
threshold number (query)	Probability threshold for including a detected object in the response in the range [0, 1] (default: 0.7). Lowering the threshold includes objects the model is less certain about. 0.7

Execute Clear

Responses

Response content type application/json

Curl

```
curl -X POST "http://max-object-detector.codait-prod-41208c73af8fca213512856c7a09db52-0000.us-east.containers.appdomain.cloud/model/predict?threshold=0.7" -H "accept: application/json" -H "Content-Type: multipart/form-data" -F "image=@traffic.jpeg;type=image/jpeg"
```

Request URL

```
http://max-object-detector.codait-prod-41208c73af8fca213512856c7a09db52-0000.us-east.containers.appdomain.cloud/model/predict?threshold=0.7
```

Server response

Code Details

200 Response body

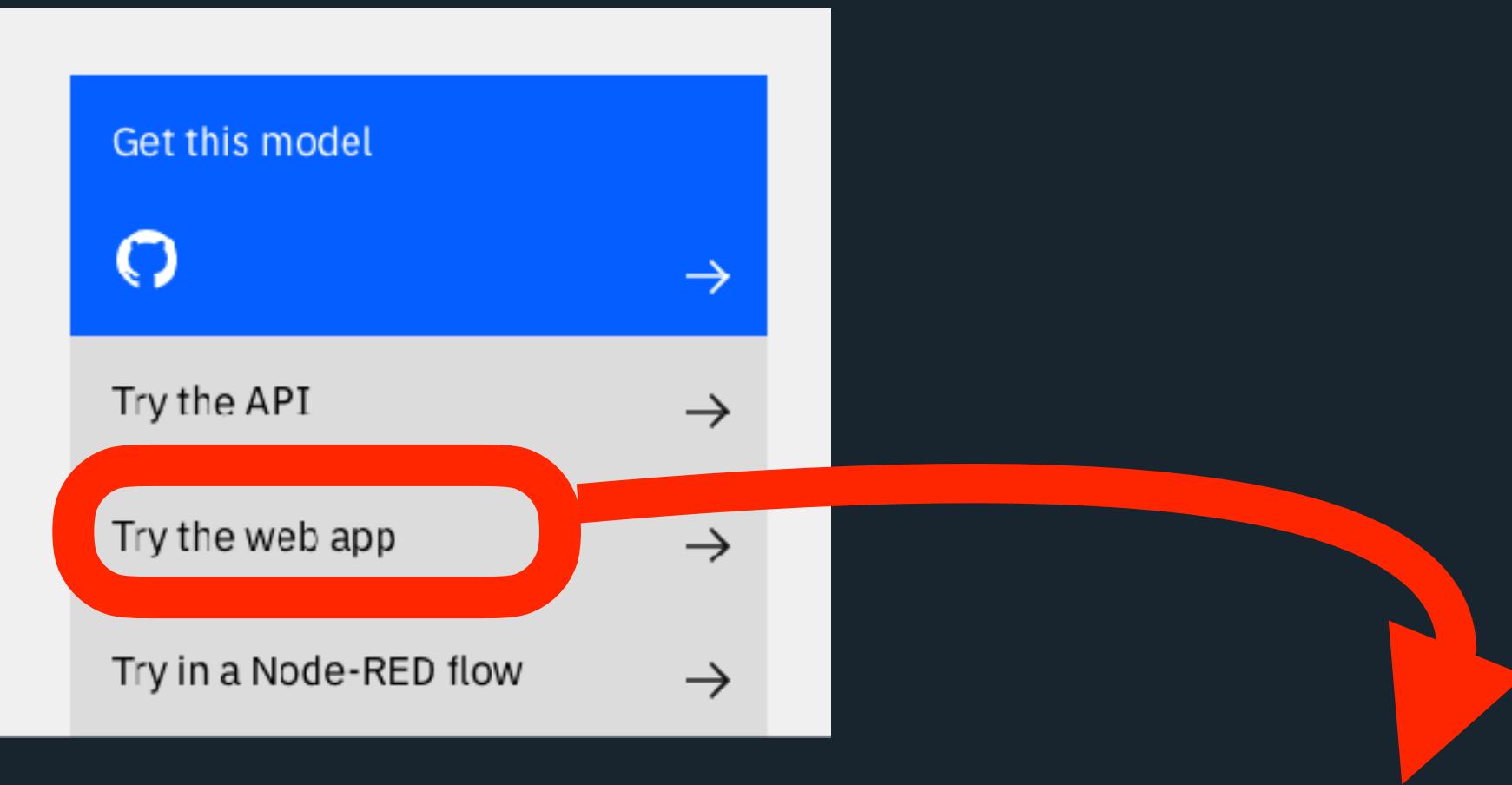
```
{
  "status": "ok",
  "predictions": [
    {
      "label_id": "3",
      "label": "car",
      "probability": 0.9741689627685517,
      "detection_box": [
        0.4575640559196472,
        0.4168500304222107,
        0.6725007891654968,
        0.9029390215873718
      ]
    },
    {
      "label_id": "1",
      "label": "person",
      "probability": 0.8824045658111572,
      "detection_box": [
        0.6231690645217896,
        0.30522748927934265,
        0.8462619781494141,
        0.4034259617328644
      ]
    },
    {
      "label_id": "4",
      "label": "motorcycle",
      "probability": 0.8141902685165405,
      "detection_box": [
        0.3583410978317261,
        0.11843161284923553,
        0.5388588117141724,
        0.37292349338531494
      ]
    }
  ]
}
```

Access the API via Web App

Model | Deployable, Trainable

Object Detector

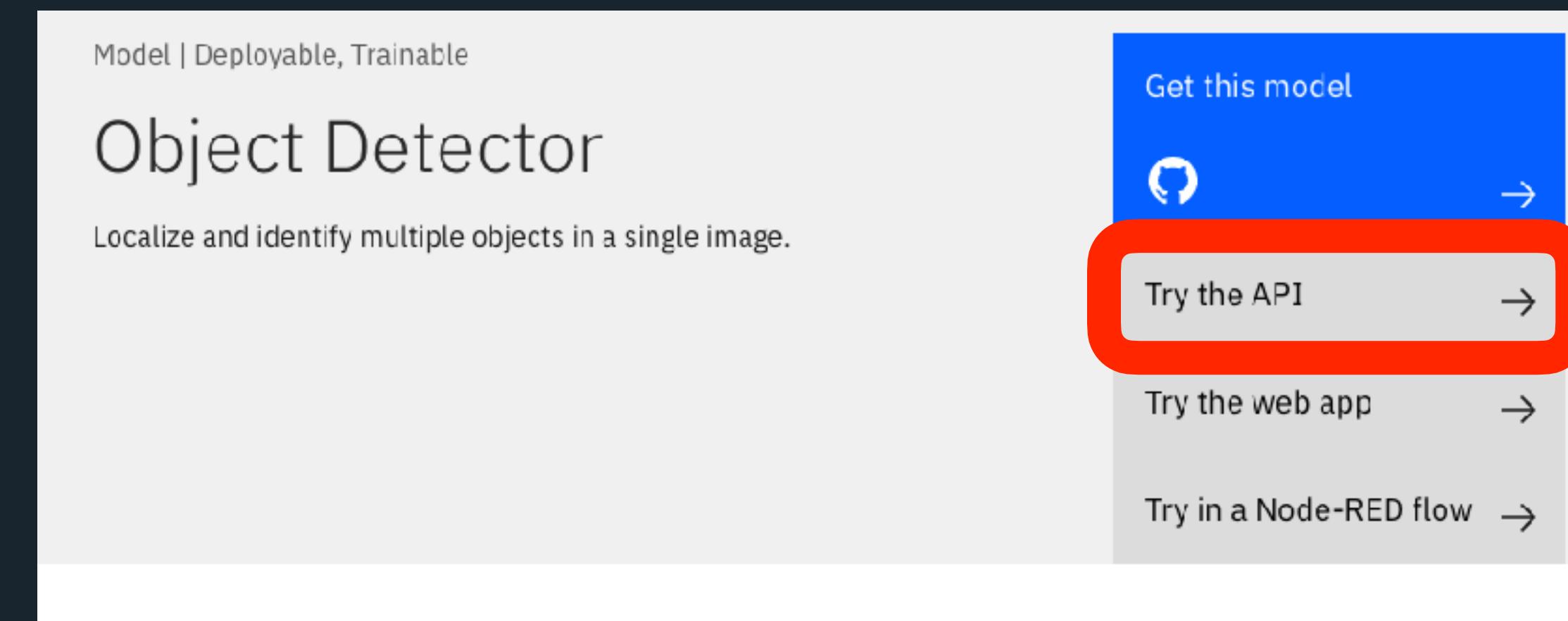
Localize and identify multiple objects in a single image.



The screenshot shows the MAX Object Detector web application. On the left is a logo featuring a stylized brain and a bar chart. Next to it is the text "MAX Object Detector". To the right is a form titled "Upload an image" with a "Choose File" button, a "No file chosen" message, a "Submit" button, and a "Use your webcam" button. Further right is a section titled "Filter detected objects ⓘ" with a "Probability Threshold: 70%" slider set to 70%. On the far right is a "Labels Found ⓘ" section showing icons for a person and a dog. Below these sections is a photograph of a woman sitting on the grass with a dog. Two green bounding boxes are drawn around them, with the text "person : 88.9%" above the woman and "dog : 81.2%" above the dog.

Try yourself here:
ibm.biz/object-detector-webapp

Access the API via R



```
library(dplyr)
library(httr)

# Endpoint
endpoint <- 'http://max-object-detector.codait-prod-41208c73af8fca213512856c7a09db52-0000.us-east.containers.appdomain.cloud/'
# endpoint <- 'http://localhost:5000' # if running docker locally or docker hub

object_detector <- function(path_to_img, endpoint) {
  model_endpoint <- paste0(endpoint, 'model/predict') # Model endpoint
  # POST
  response <- httr::POST(url = model_endpoint,
                          body = list(image = upload_file(path_to_img,
                                                          type = "image/jpeg")),
                          encode = c("multipart"))
  ) %>% content()
  response$predictions
}

# Get the image file from GH
download.file(url = "http://github.com/IBM/MAX-Object-Detector/blob/master/samples/baby-bear.jpg?raw=true",
              'baby-bear.jpg', mode = 'wb')

object_detector("baby-bear.jpg", endpoint)
```



How do I get started?

ibm.biz/max-tutorial

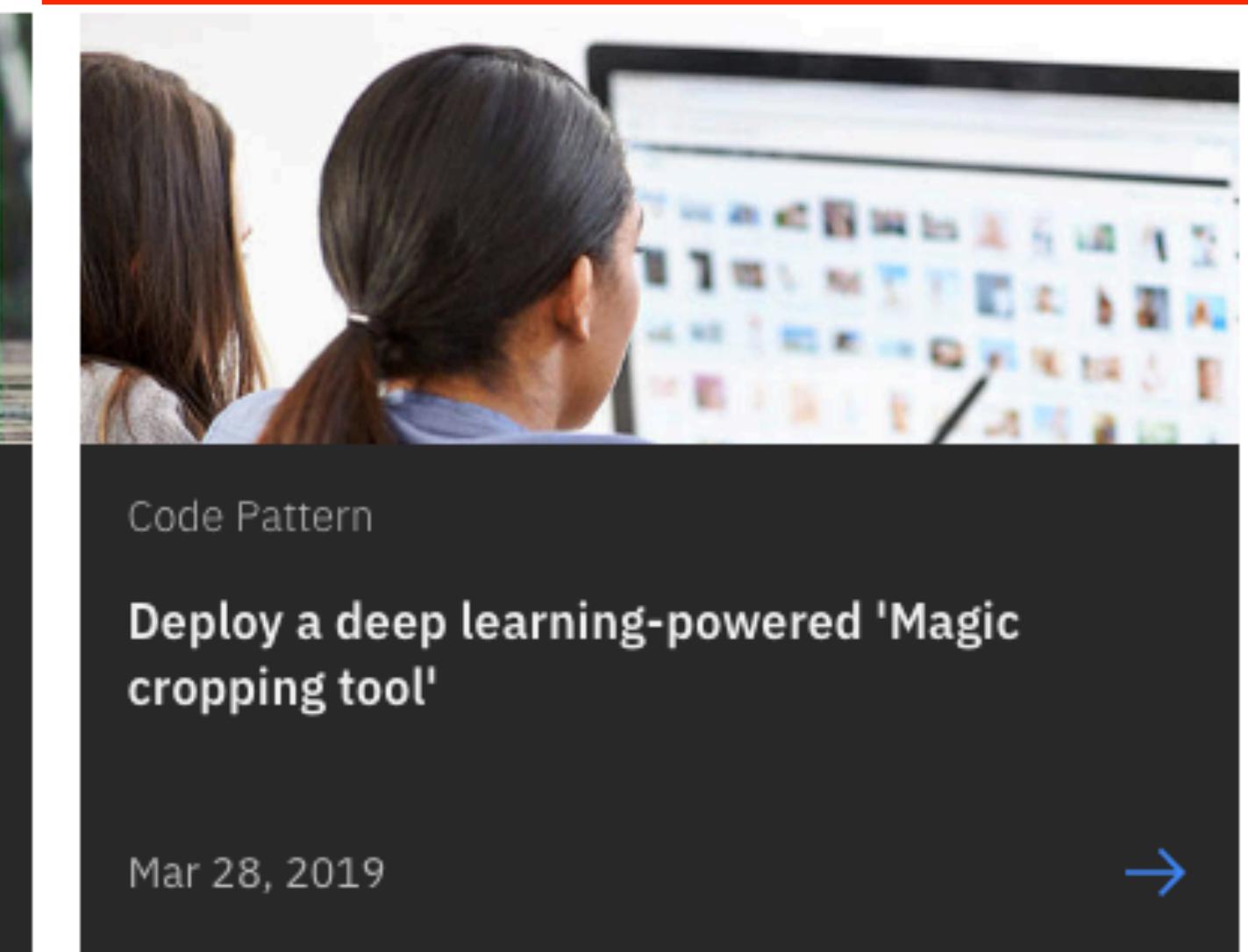
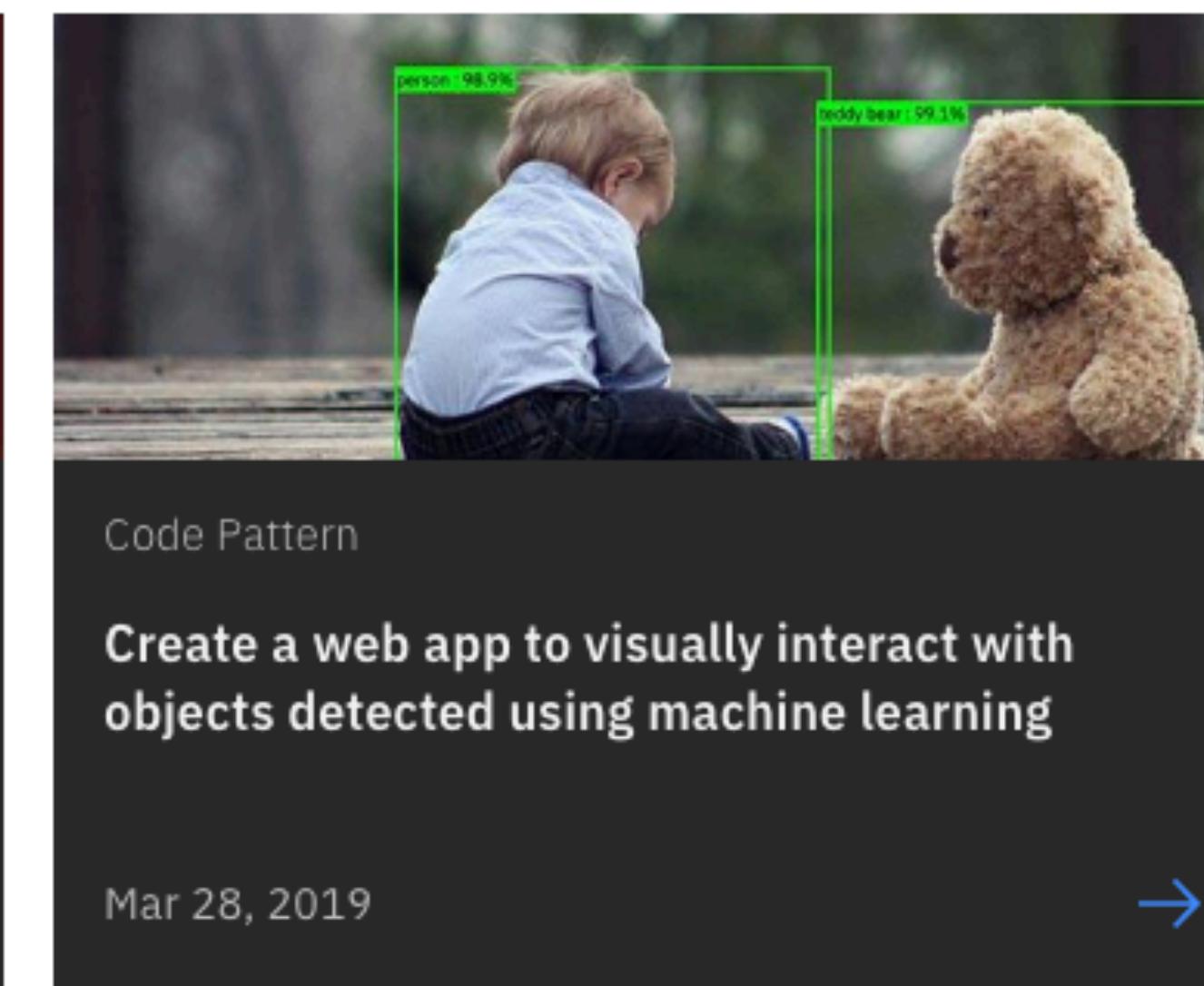
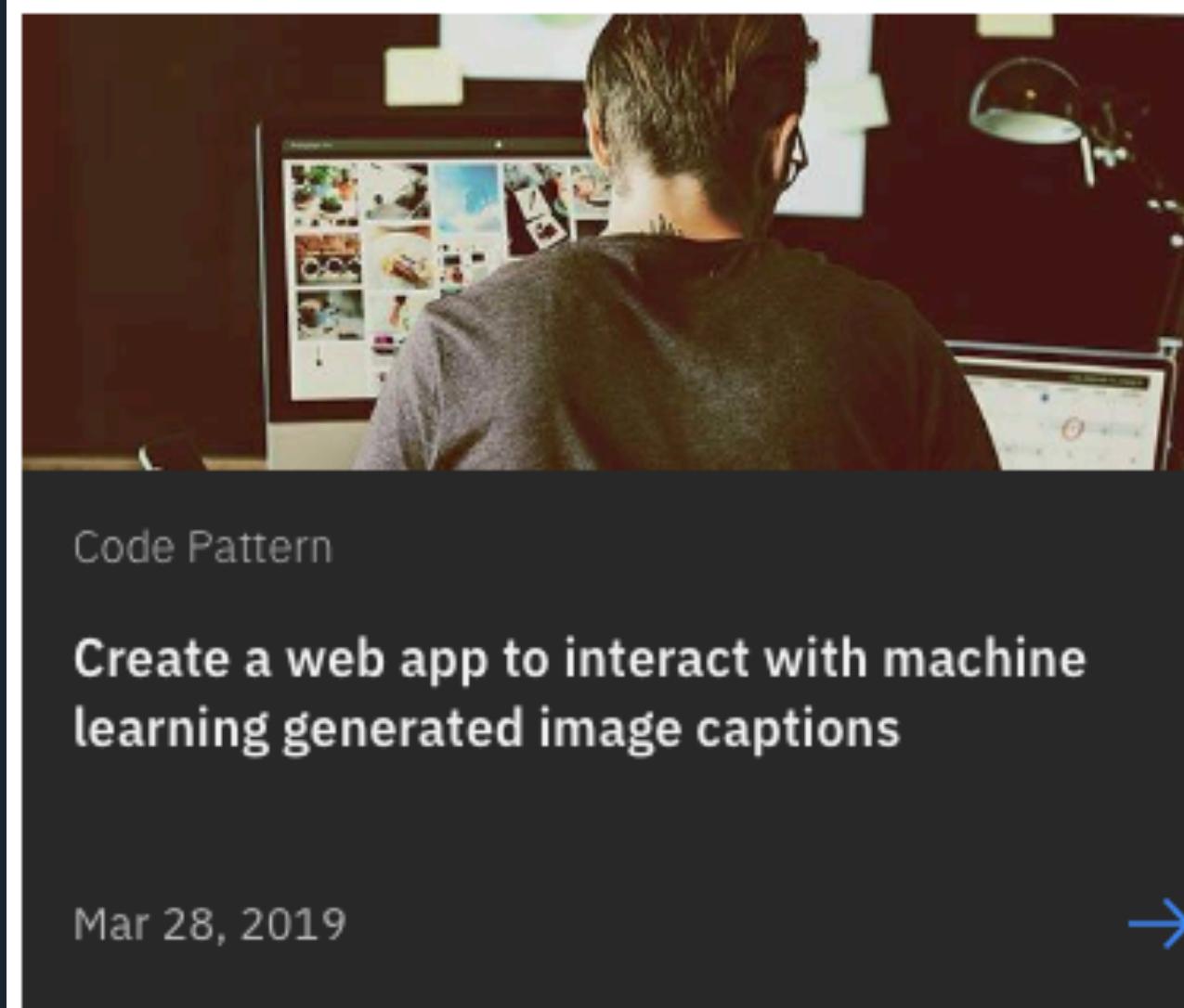
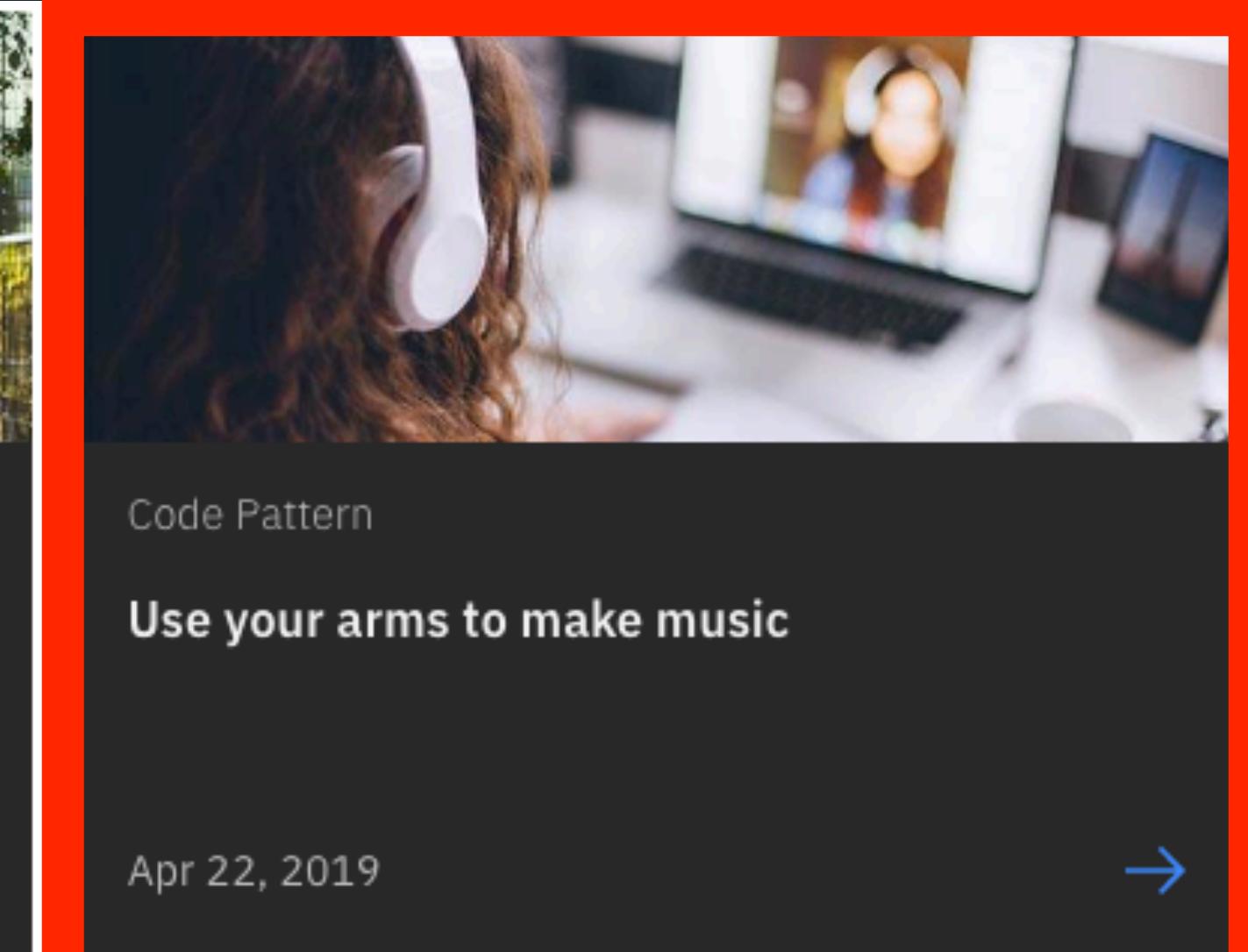
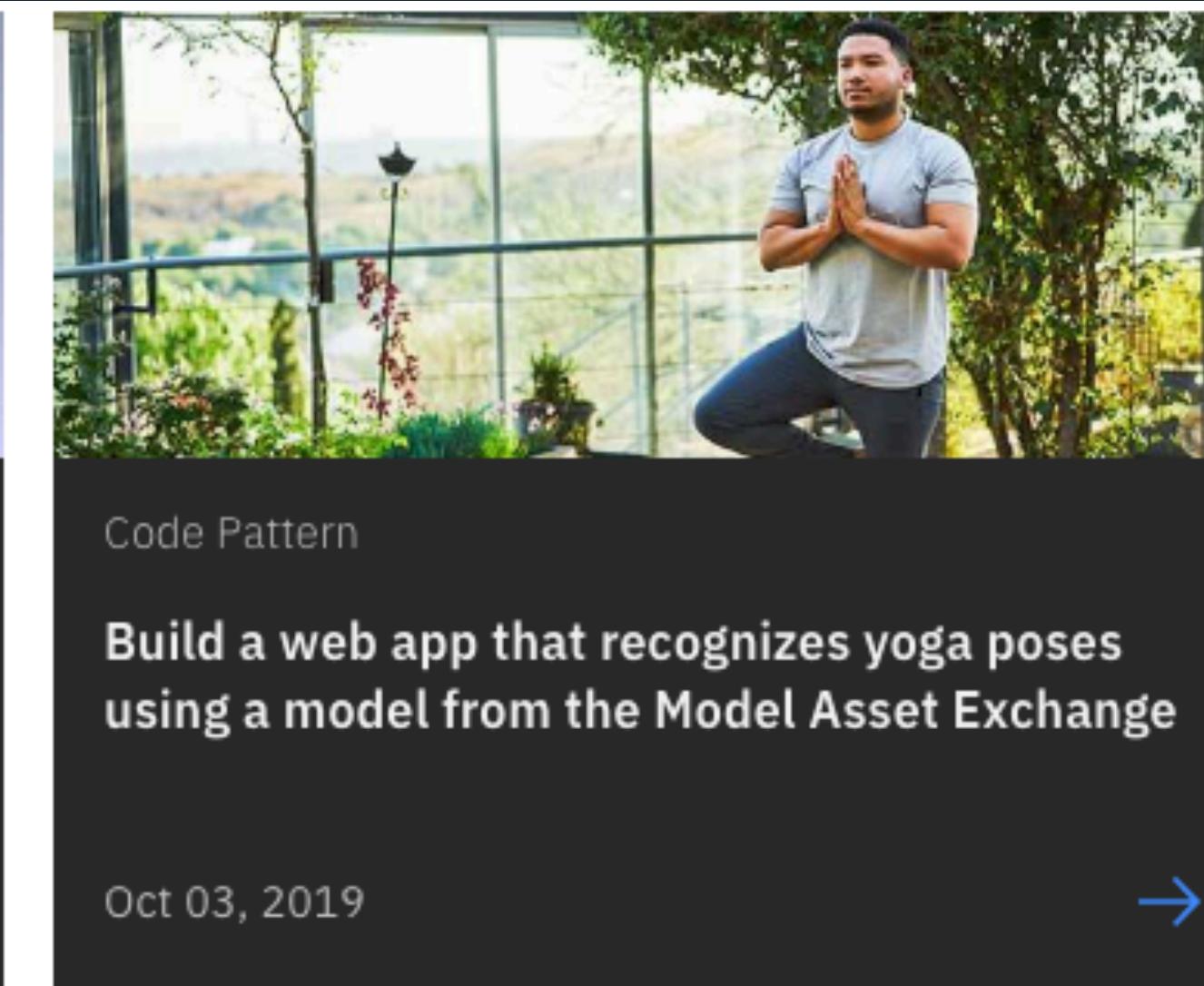
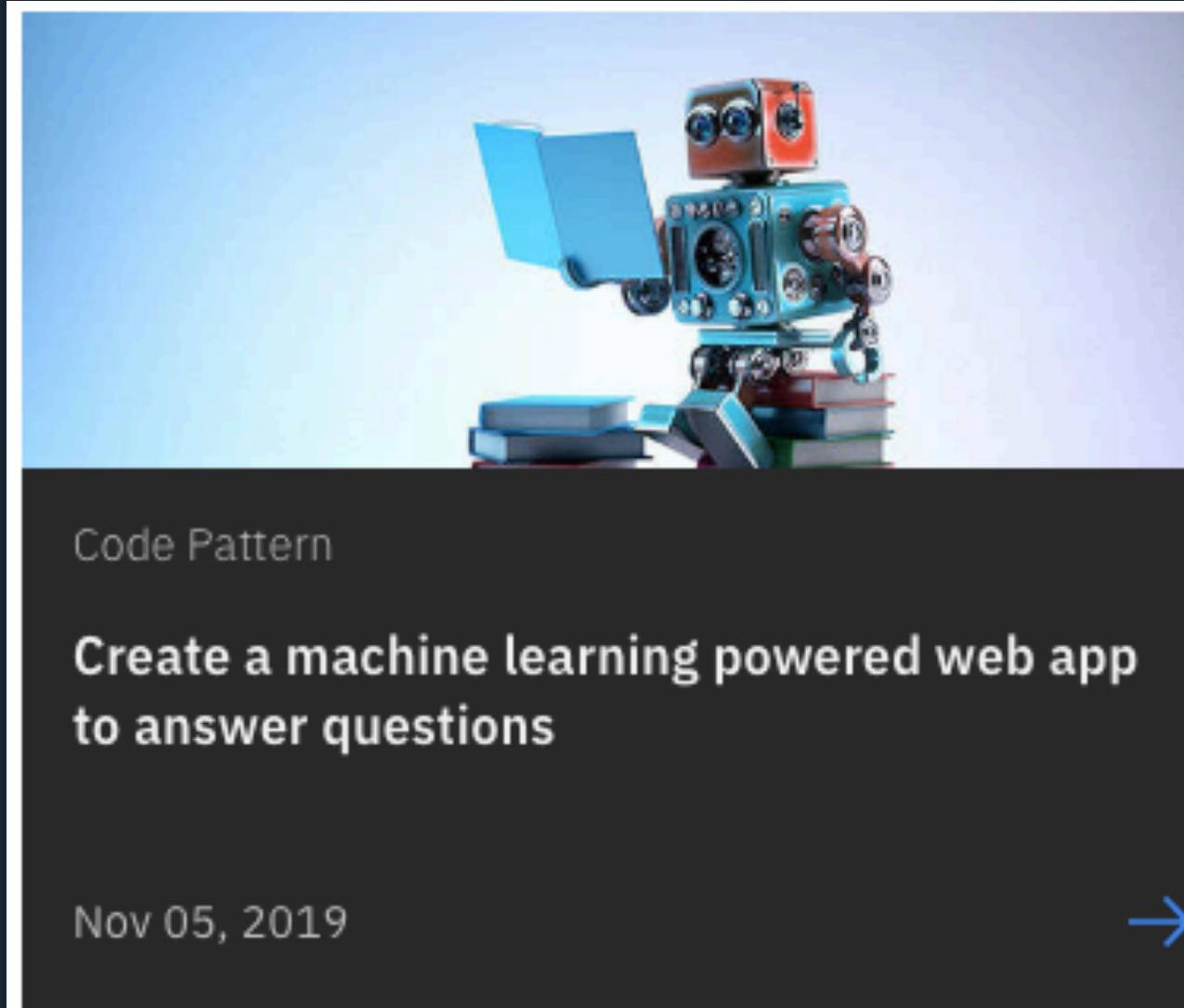
Series

Learning Path: An introduction to the Model Asset Exchange

Learn how to use state-of-the-art deep learning models in your applications or services

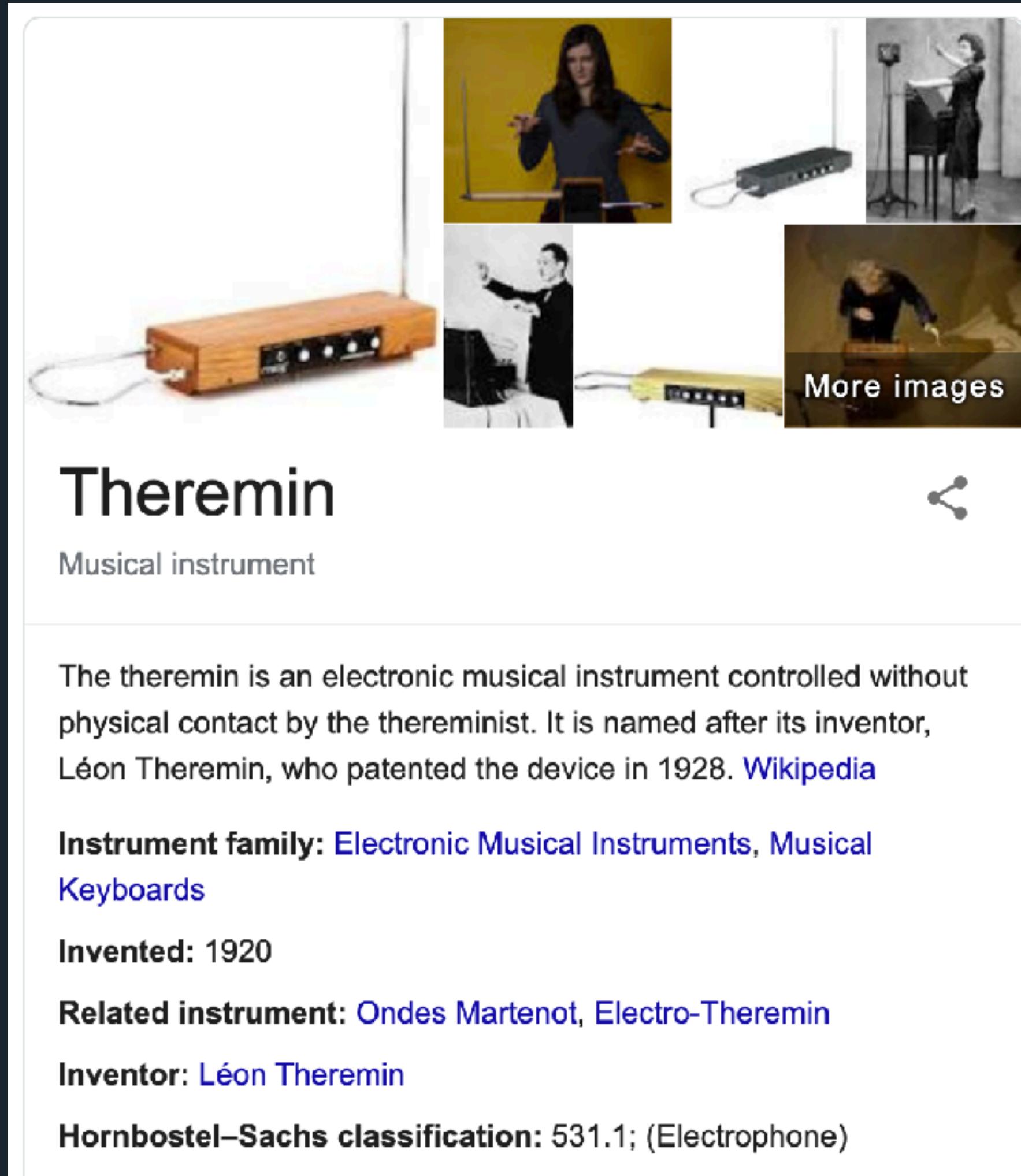
Examples on how to easily consume MAX models

ibm.biz/max-code-patterns



Use your arms to make music

Create music with your arms using the Model Asset eXchange (MAX) **human pose estimator** model and **TensorFlow**



The screenshot shows a Wikipedia page for the Theremin. At the top left is a wooden theremin device with two metal antennae. To its right are several smaller images: a person playing, a close-up of the instrument, a person standing at a piano-like keyboard, and a historical black-and-white photo of a woman playing. Below these is a button labeled "More images". The title "Theremin" is in large bold letters, followed by the subtitle "Musical instrument". A "Share" icon is to the right of the title. The main text describes the theremin as an electronic musical instrument controlled without physical contact, invented in 1920 by Léon Theremin, and links to the Wikipedia article. Below this are sections for "Instrument family", "Invented", "Related instrument", "Inventor", and "Hornbostel-Sachs classification".

Theremin

Musical instrument

The theremin is an electronic musical instrument controlled without physical contact by the thereminist. It is named after its inventor, Léon Theremin, who patented the device in 1928. [Wikipedia](#)

Instrument family: Electronic Musical Instruments, Musical Keyboards

Invented: 1920

Related instrument: Ondes Martenot, Electro-Theremin

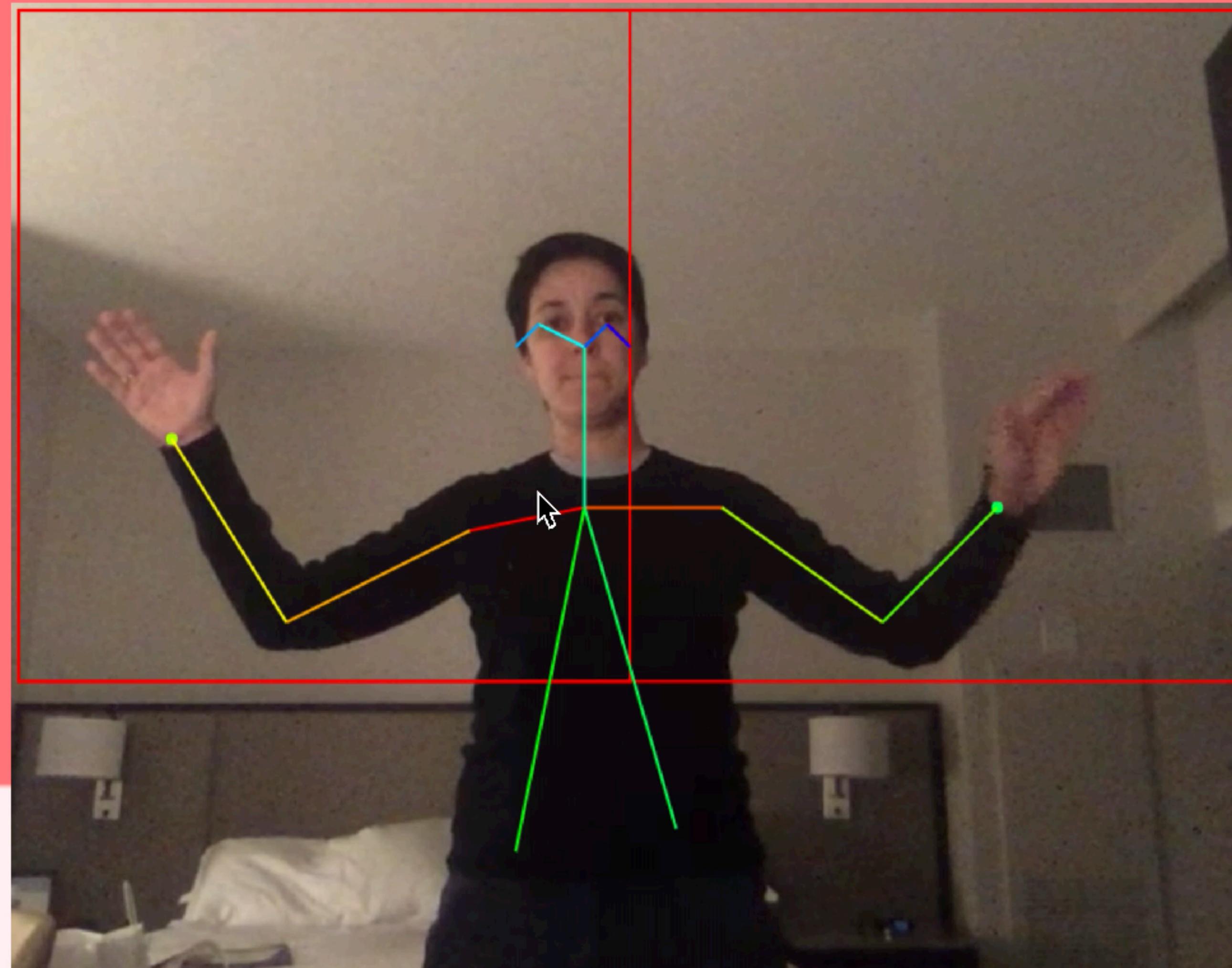
Inventor: Léon Theremin

Hornbostel-Sachs classification: 531.1; (Electrophone)



veremax

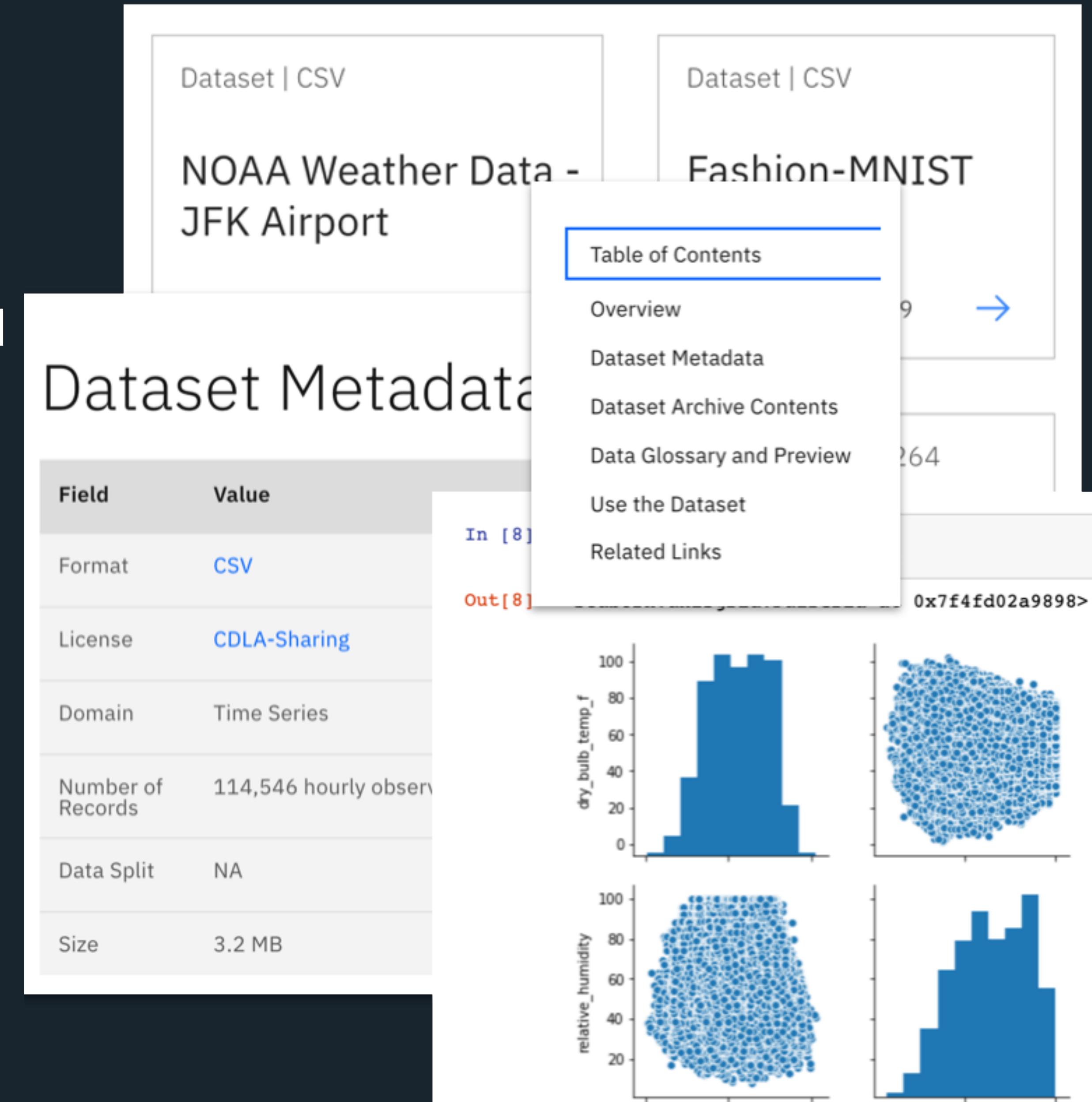
a video theremin using OpenPose



Data Asset eXchange (DAX)

- Curated repository for **open** datasets from IBM Research and third-parties
- Published under data friendly licenses
- Standardized dataset formats and metadata
- Many data sets include starter notebooks (cleansing, data exploration, analysis)

ibm.biz/data-exchange



Data Asset eXchange

Explore useful and relevant data sets for enterprise data science

ibm.biz/data-exchange

Dataset CSV NOAA Weather Data - JFK Airport August 11, 2020 →	Dataset TSV Groningen Meaning Bank - Modified May 14, 2020 →	Dataset CSV Fashion-MNIST August 17, 2020 →	Dataset CSV, H.264 Double Pendulum Chaotic September 12, 2019 →	Dataset CSV IBM Debater® Concept Abstractness July 29, 2019 →	Dataset XLSX, TXT IBM Debater® Sentiment Composition Lexicons August 1, 2019 →
Dataset JPG, JSON PubLayNet August 15, 2020 →	Dataset WAV TensorFlow Speech Commands August 17, 2020 →	Dataset PNG, JSON PubTabNet August 11, 2020 →	Dataset CSV IBM Debater® Claim Sentences Search Augus: 1, 2019 →	Dataset ANN IBM Debater® Mention Detection Benchmark July 29, 2019 →	Dataset CSV IBM Debater® Wikipedia Category Stance August 1, 2019 →
Dataset JSON, HDF5 Oil Reservoir Simulations August 11, 2020 →	Dataset CoNLL-U Finance Proposition Bank August 11, 2020 →	Dataset CoNLL-U Contracts Proposition Bank August 11, 2020 →	Dataset CSV IBM Debater® Wikipedia Oriented Relatedness August 1, 2019 →	Dataset CSV IBM Debater® Thematic Clustering of Sentences August 3, 2019 →	Dataset XML Forum Classify September 12, 2019 →
Dataset XML Forum Summarization September 12, 2019 →	Dataset CSV Expert in the Loop AI - Polymer Discovery June 15, 2020 →	Dataset Parquet Mono Lake Surface Water Extent Landsat8 Data May 6, 2020 →	Dataset TSV, TXT WebQSP Relation Detection May 7, 2020 →	Dataset CSV IBM Debater® Multi Word Term Relatedness Benchmark July 29, 2019 →	Dataset WAV, TXT IBM Debater® Recorded Debating #1 June 29, 2020 →
Dataset Text WikiText-103 June 23, 2020 →	Dataset TSV, IXI SimpleQuestions Relation Detection May 7, 2020 →	Dataset CSV Taranaki Basin Curated Well Logs May 10, 2020 →	Dataset WAV, CSV, TXT IBM Debater® Recorded Debating #2 Augus: 3, 2019 →	Dataset WAV, CSV, TXT IBM Debater® Recorded Debating #3 August 12, 2015 →	Dataset TSV IBM Debater® Sentiment Lexicon of IDiomtic Expressions (SLIDE) September 5, 2019 →
Dataset MP4, CSV Video-Text Compliance June 29, 2020 →	Dataset CSV, JSON Nutch July 16, 2019 →	Dataset TSV Wikipedia Entity Graph April 23, 2020 →	Dataset TXT IBM Debater® Labeled Emphasized Words in Speech July 29, 2019 →	Dataset JSON Lines MedNLI September 17, 2019 →	Dataset JSON VizWiz - Visual Question Answering March 26, 2020 →

NOAA Weather Data – JFK Airport

Local climatological data originally collected at JFK airport.

Save Like

- Get this dataset →
- Run dataset notebooks →
- Preview the data & notebooks →

NOAA Weather Data – JFK Airport

Dataset Metadata | Dataset Preview | Dataset Glossary

Format	CSV
License	CDLA-Sharing
Domain	Time Series
Number of Records	114,546 hourly observations
Data Split	NA
Size	3.2 MB
Data Origin	National Oceanic and Atmospheric Administration (NOAA)
Dataset Version	Version 2 – September 12, 2019 Version 1 – July 16, 2019
Dataset Coverage	Location: New York City Dates: 2010-01-01 through 2018-07-27 Note: To download raw data from NOAA for a different region or date span, follow the steps outlined in the data archive's README.txt. <i>Agriculture</i> Detect unseasonal temperature change and alert farmers about potential damage to plants. Energy Regulate solar cell charging hours based on weather type condition and temperature. Regulate wind turbine operation based on wind speed and wind direction. Generate energy demand alerts based on temperature. Remotely adjust air conditioning configs to boost energy efficiency based on temperature shifts. <i>Retail</i> Estimate outdoor retail foot traffic based on weather condition and temperature predictions.
Business Use Case	

NOAA Weather Data – JFK Airport

Part 1 - Data Cleaning

Part 2 - Data Analysis

Part 3 - Time Series Forecasting

```
In [1]: # @hidden_cell
# The project token is an authorization token that is used to access project resources like data sources, connections, and used by platform APIs.
from project_lib import Project
project = Project(project_id='...', project_access_token='...')
```

Cleaning NOAA Weather Data of JFK Airport (New York)

This notebook relates to the NOAA Weather Dataset - JFK Airport (New York). The dataset contains 114,546 hourly observations of 12 local climatological variables (such as temperature and wind speed) collected at JFK airport. This dataset can be obtained for free from the IBM Developer [Data Asset Exchange](#).

In this notebook, we clean the raw dataset by:

- removing redundant columns and preserving only key numeric columns
- converting and cleaning data where required
- creating a fixed time interval between observations (this aids with later time-series analysis)
- filling missing values
- encoding certain weather features

Table of Contents:

- [0. Prerequisites](#)
- [1. Read the Raw Data](#)
- [2. Clean the Data](#)
 - [2.1 Select data columns](#)
 - [2.2 Clean up precipitation column](#)
 - [2.3 Convert columns to numerical types](#)
 - [2.4 Reformat and process data](#)
 - [2.5 Create a fixed interval dataset](#)
 - [2.6 Feature encoding](#)
 - [2.7 Rename columns](#)

Show me more!



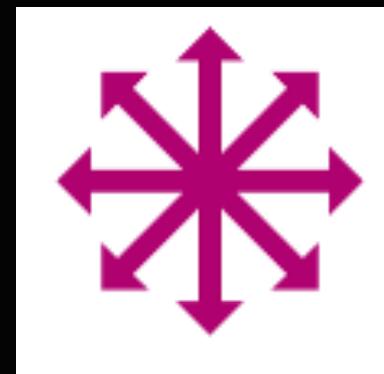
Trusted AI Lifecycle through Open Source

Pillars of trust, woven into the lifecycle of an AI application



IBM and LFAI move forward on
trustworthy and responsible AI
IBM donates Trusted AI toolkits to the Linux Foundation AI

Did anyone tamper
with it?



ROBUSTNESS

Adversarial Robustness 360
↳ (ART)

DEMO: art-demo.mybluemix.net

Is it fair?



FAIRNESS

AI Fairness 360
↳ (AIF360)

DEMO: aif360.mybluemix.net

Is it easy to understand?

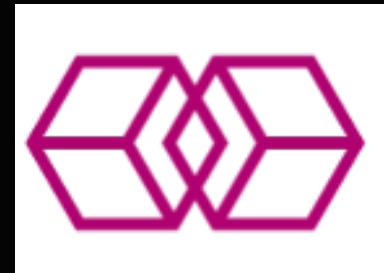


EXPLAINABILITY

AI Explainability 360
↳ (AIX360)

DEMO: aix360.mybluemix.net

Is it accountable?



LINEAGE

AI FactSheets 360

DEMO: aifs360.mybluemix.net

Trusted-AI

This GitHub org hosts LF AI Foundation projects in the category of Trusted and Responsible AI.

IBM @LFAI_Foundation info@lfaifoundation.org

Repositories 4 Packages People Projects

Pinned repositories

adversarial-robustness-toolbox
Adversarial Robustness Toolbox (ART) - Python Library for Machine Learning Security - Evasion, Poisoning, Extraction, Inference
Python 1.7k 480

AIF360
A comprehensive set of fairness metrics for datasets and machine learning models, explanations for these metrics, and algorithms to mitigate bias in datasets and models.
Python 1k 340

AIX360
Interpretability and explainability of data and machine learning models
Python 621 136

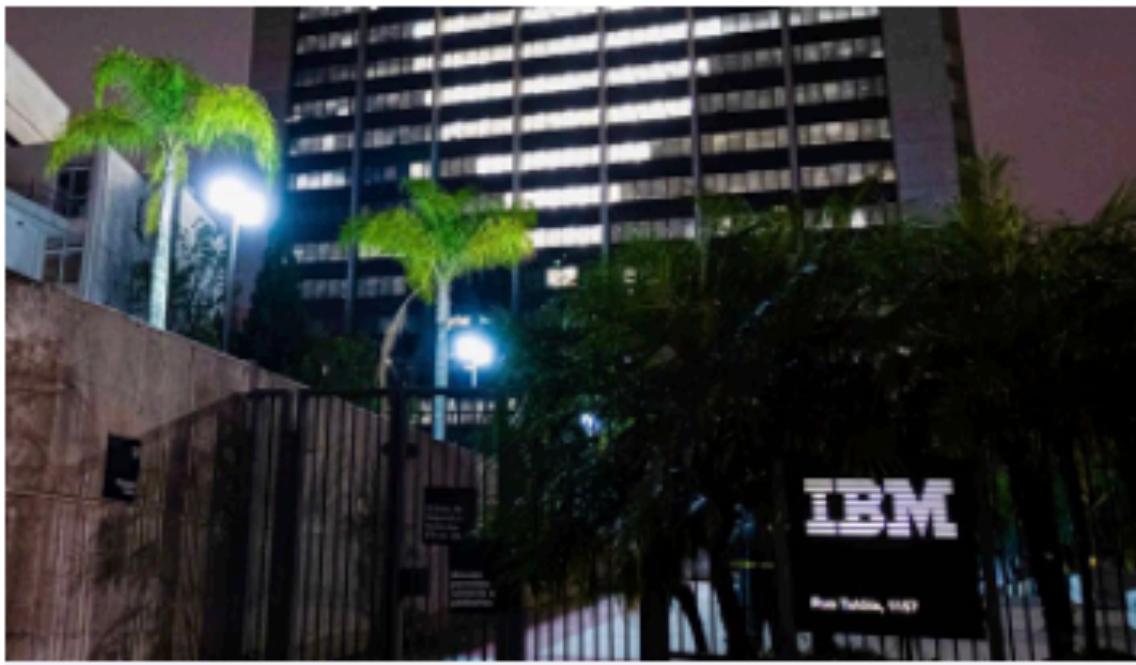
AI Fairness 360 (AIF360) R Package
CRAN 0.1.0 CRAN 0.1.0

Available in R too!

Por que trabalhar na IBM?



Por que se juntar à IBM



Ajude a mudar o mundo

Veja como o nosso trabalho está realmente mudando a vida das pessoas, desde ajudar a curar doenças, prever o clima, limpar oceanos e muito mais.



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Carreiras são feitas de experiências. Na IBM, essas experiências podem ser diversas, ilimitadas e de longo alcance.



Processo seletivo



Aprenda mais sobre o processo





Junte-se a nós!

Caso tenham interesse em fazer parte do time IBM, se inscrevam nesse link, onde entraremos em contato divulgando nossas oportunidades em aberto!

ibm.biz/cloudgirls17

Siga a gente:

bit.ly/ai-inclusive-instagram



Materiais de Inteligência Artificial,
Ciência de Dados, Machine Learning
Eventos, Ingressos de graça e muito
mais!

Em breve:

Bolsas de estudo para cursos de R,
Python, Ciência de Dados, SQL, e
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slides e material: bit.ly/ibm-cloud-girls



Salve o nosso repositório com estrela

