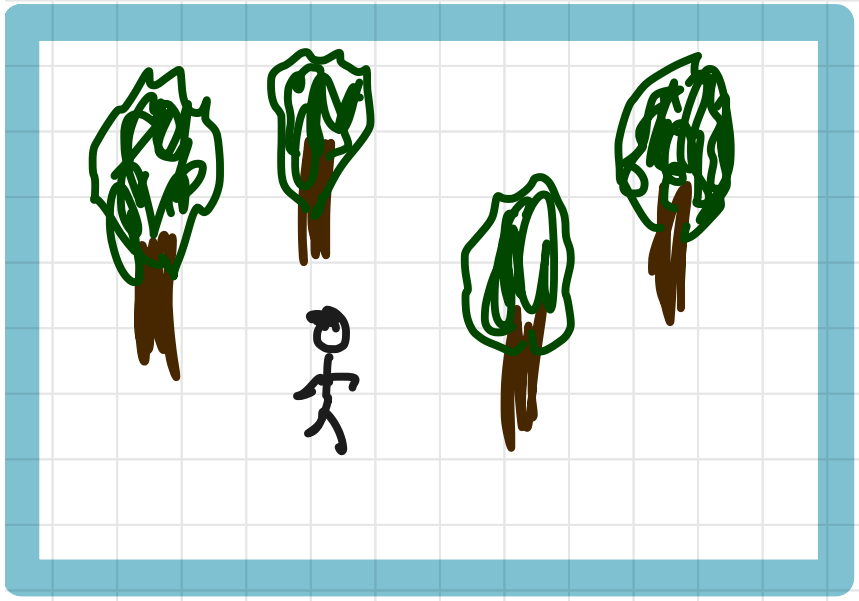
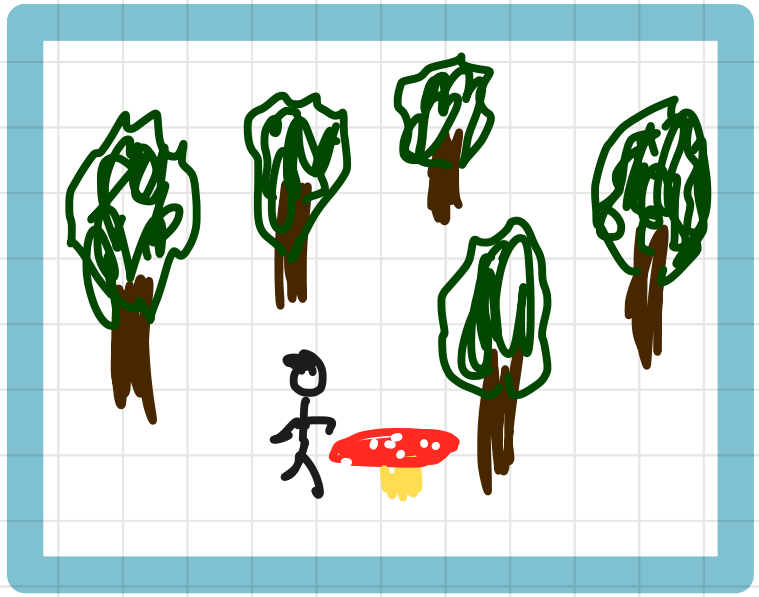
Welcome and Introduction

Pavlos Protopapas

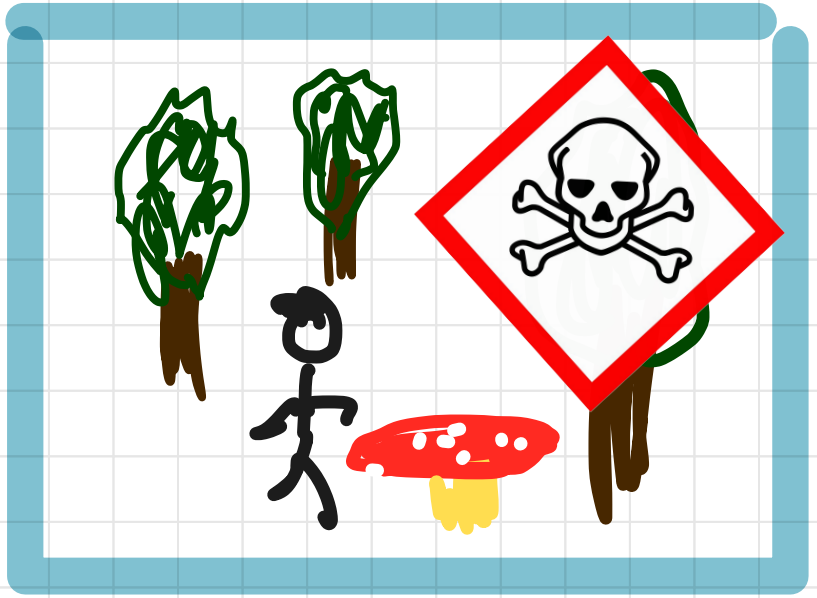
MOTIVATION



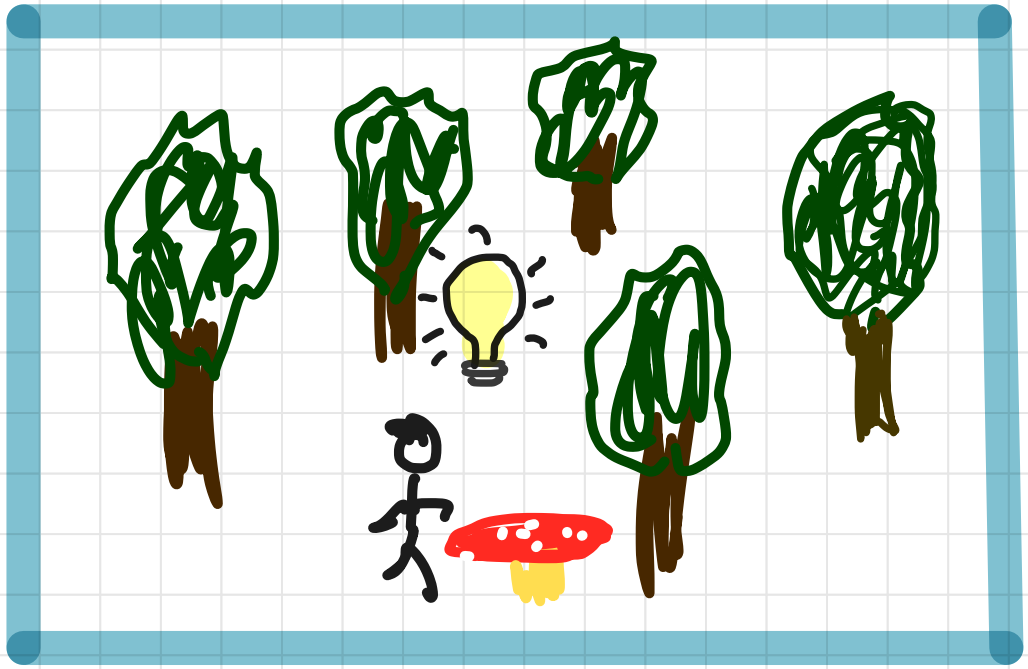
I was walking in the forest...



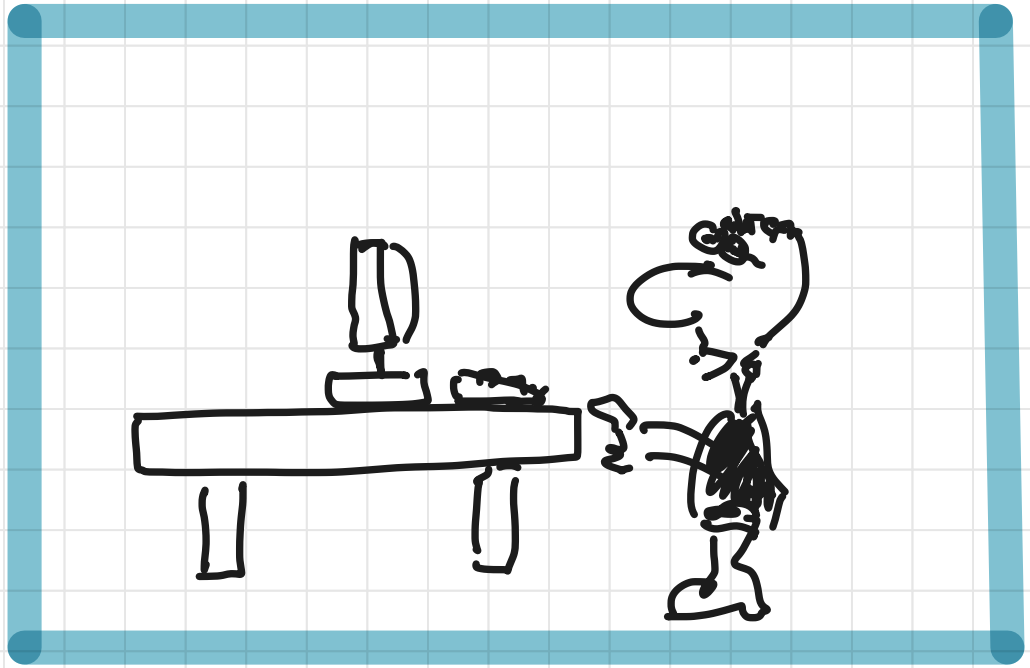
When I saw a mushroom!



But I was not sure if it was poisonous or not?



Then I had the idea of building a computer vision program that could classify rooms



I built the model and it was performing very well.

AND THEN IT WAS FORGOTTEN

Mckinsey Global Survey’s findings on Adoption of AI shows nearly 25% year over year increase in the use of AI.

50% of companies spend between 8 and 90 days deploying a single AI model, with 18% taking longer than 90 days.

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A report by IDC that surveyed 2,473 organizations and their experience with ML found that a significant portion of **attempted deployments fail,** quoting **lack of expertise**, as one of the key factors [1]

[1] (https://arxiv.org/pdf/2011.09926.pdf).

PROBLEM STATEMENT

Create a user friendly tool that helps future dog owners find a dog who is a good fit for their lifestyle and family enviroment

There are two stages:

A. Select based on certain features such as size color or an uploaded photo of a dog.

B. Allow the user to chat with a persona of the dog.

PROJECT WORKFLOW

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Explore data: Data provided by Austin Pet Alive.

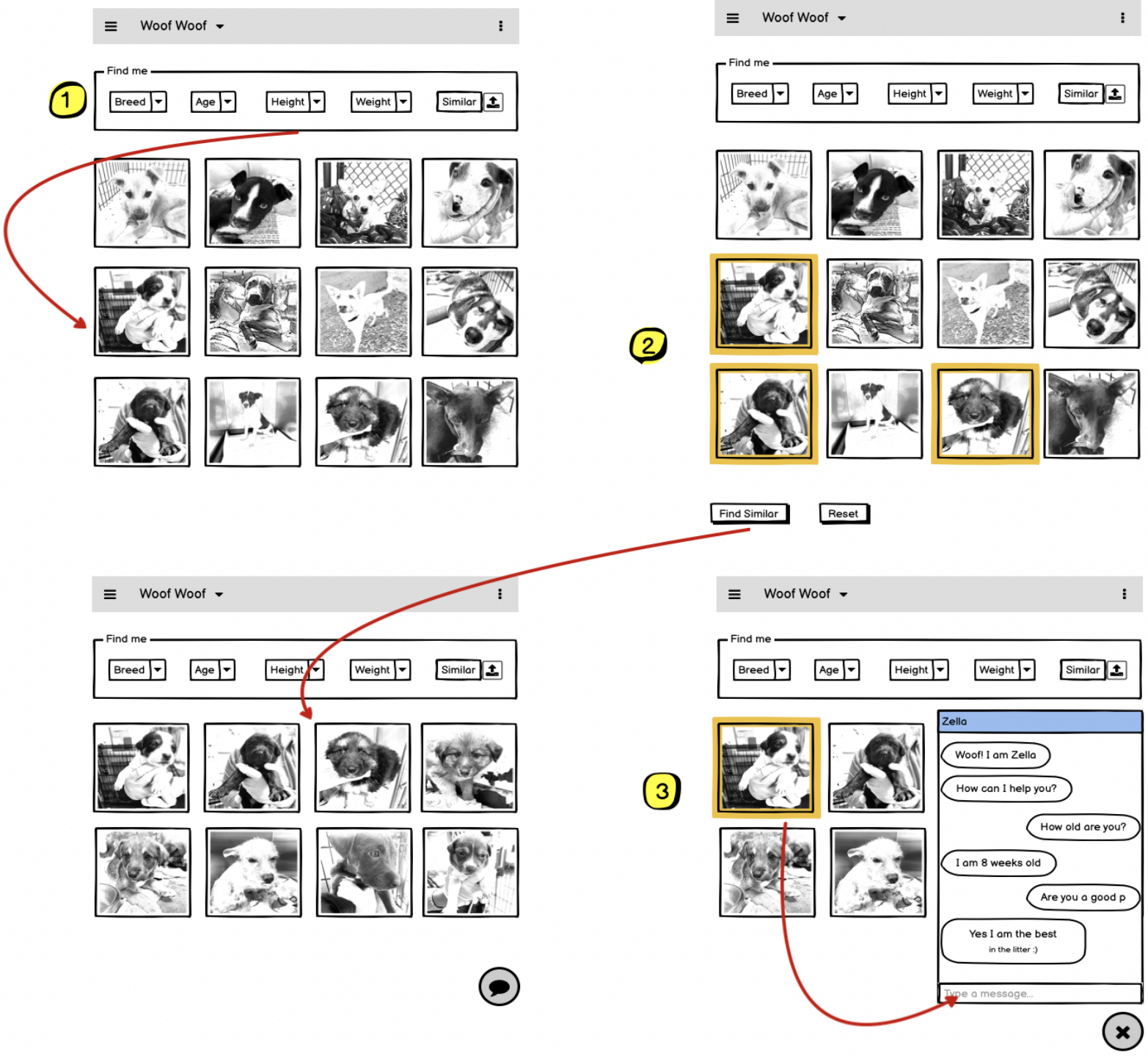
- Identify the type of data
- Preprecessing

Build models:

- Computer vision: find similar looking dogs
- Language models: Build question + answer model

Deploy:

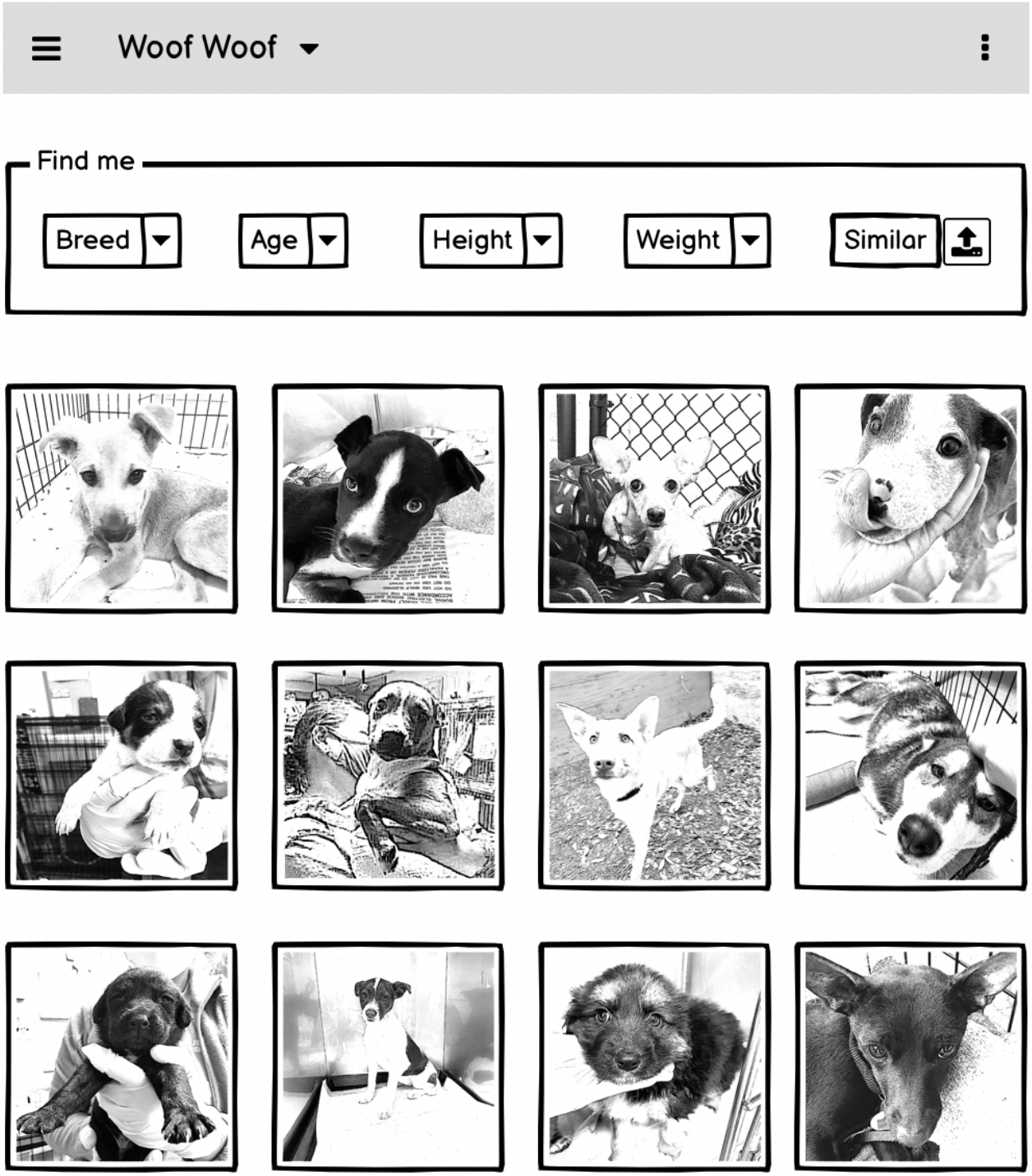
- Deploy the app in AWS.
- Create deployment scripts and provisioning AWS instances



1.User can find dogs using “Find me” filters

2.Select one or more dogs to find dogs similar to the selected ones

3.Select a dog to chat with. This opens up a personalized chatbot for the selected dog



Home Page:

Default page when app starts up

Top “n” dogs shown by default

Image card displays name and image of dog

Image cards are selectable (multiple)

“Find Similar” button shows up when one or more image cards are selected

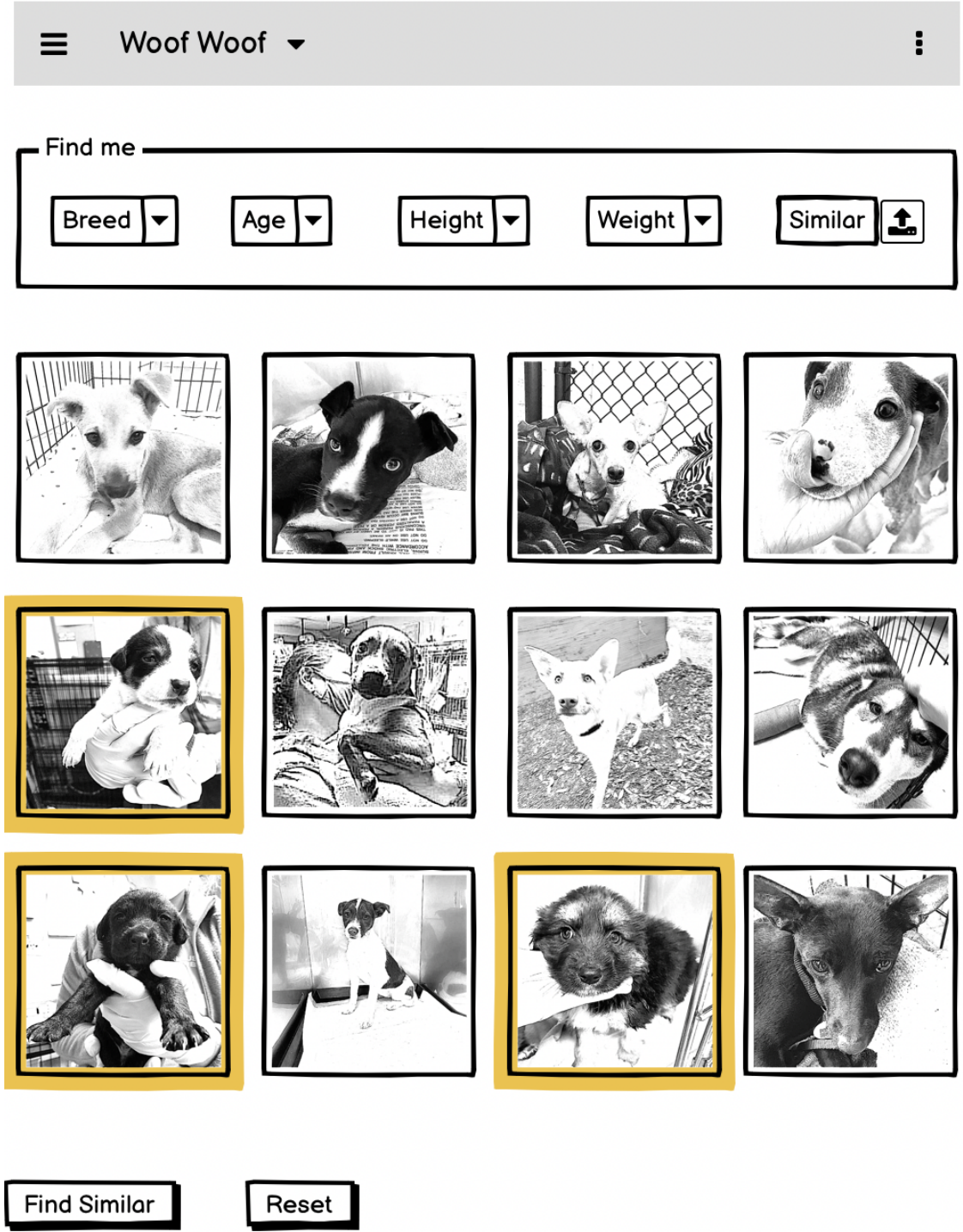
“Find me” Search/Filter:

The search/filter section will stay on each page

Allows filter by:

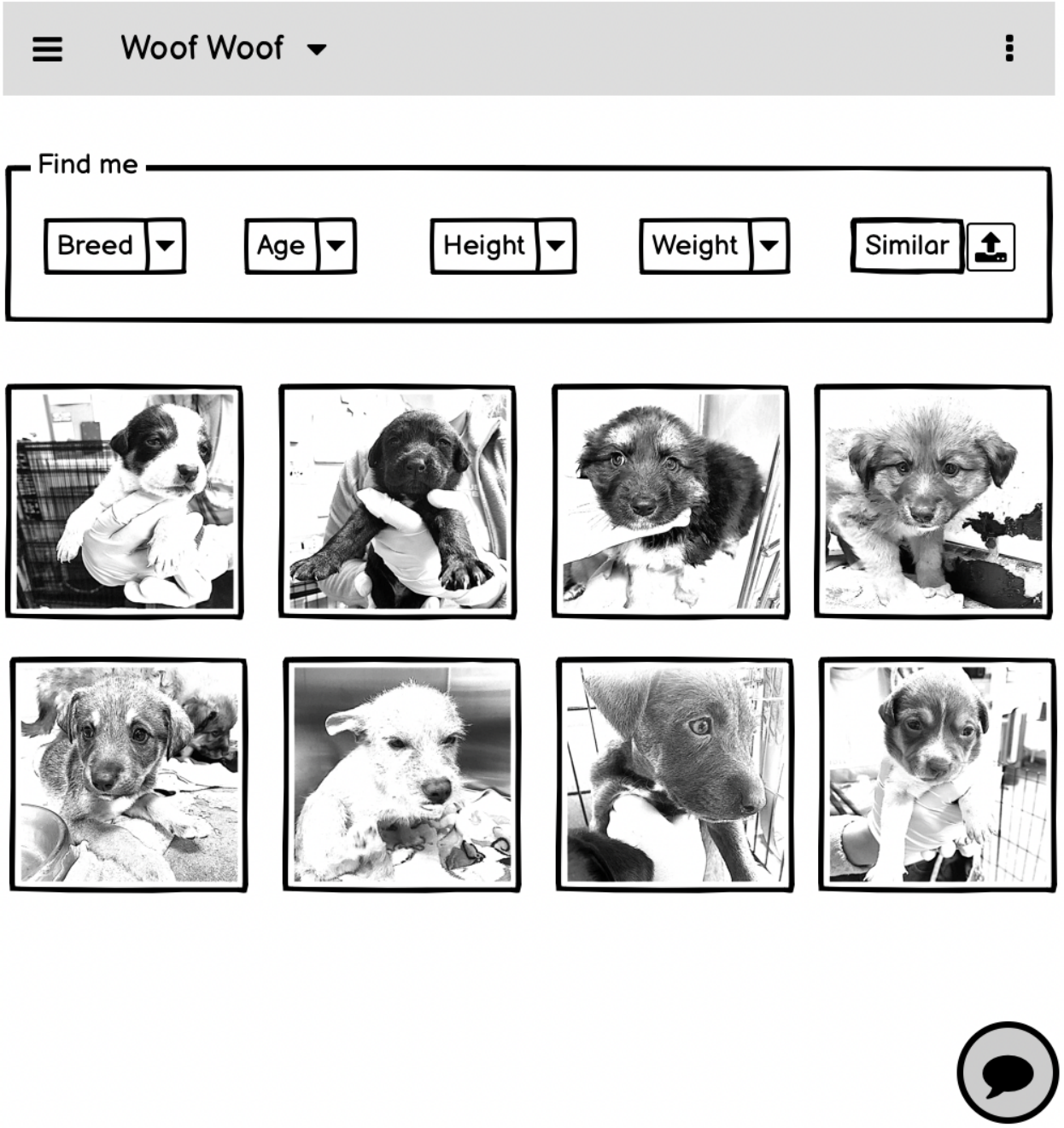
- Breed
- Age (range)
- Height (range)
- Weight (range)
- Similar - an image upload to find dogs similar to the dog in the uploaded picture

The filter will get applied on change of any of the filter elements and refresh the image grid

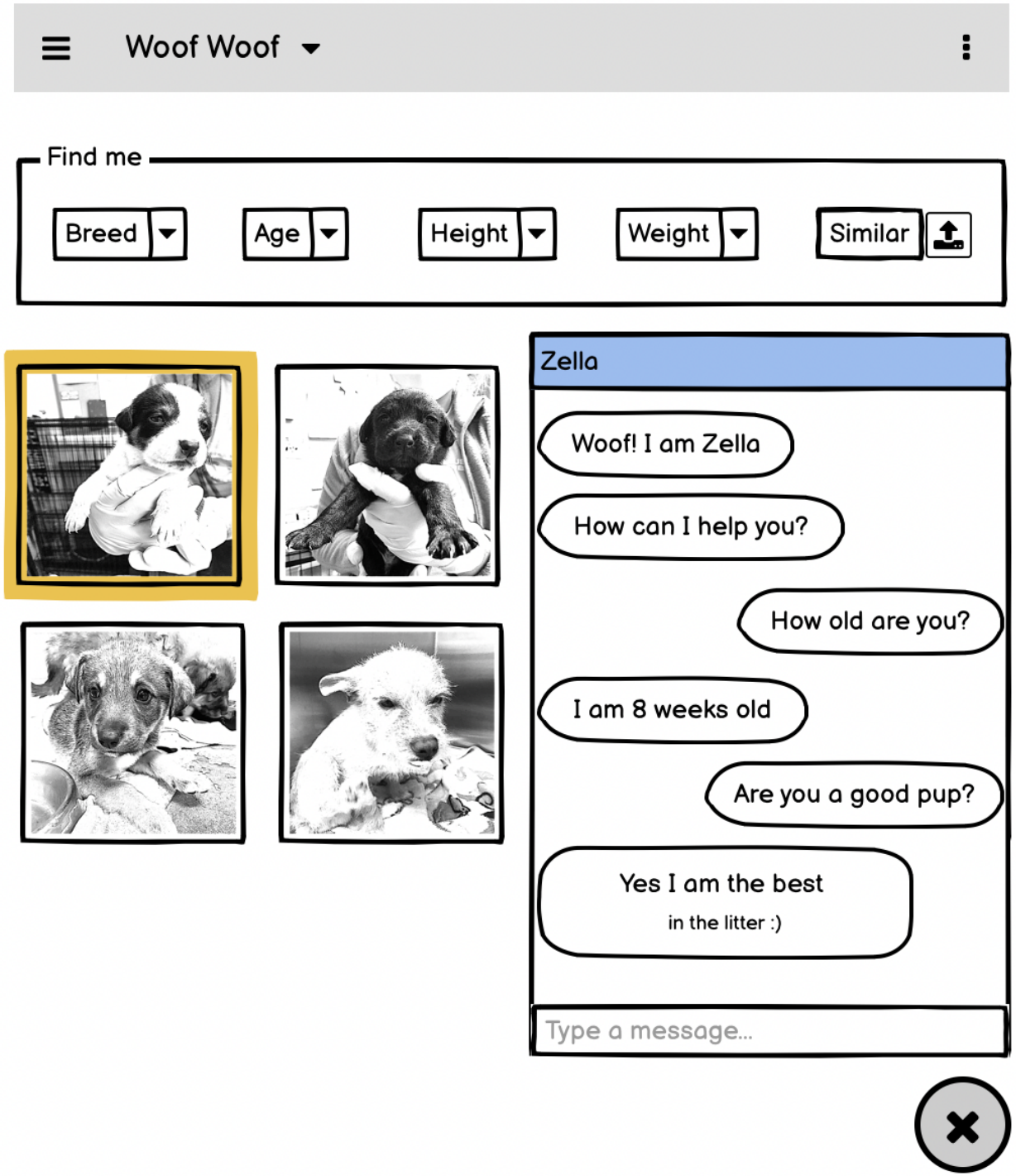


Select dogs to find more similar dogs:

- Click on image grid cards to select one or more dogs
- Click on “Find Similar” button to find dogs similar to the ones selected



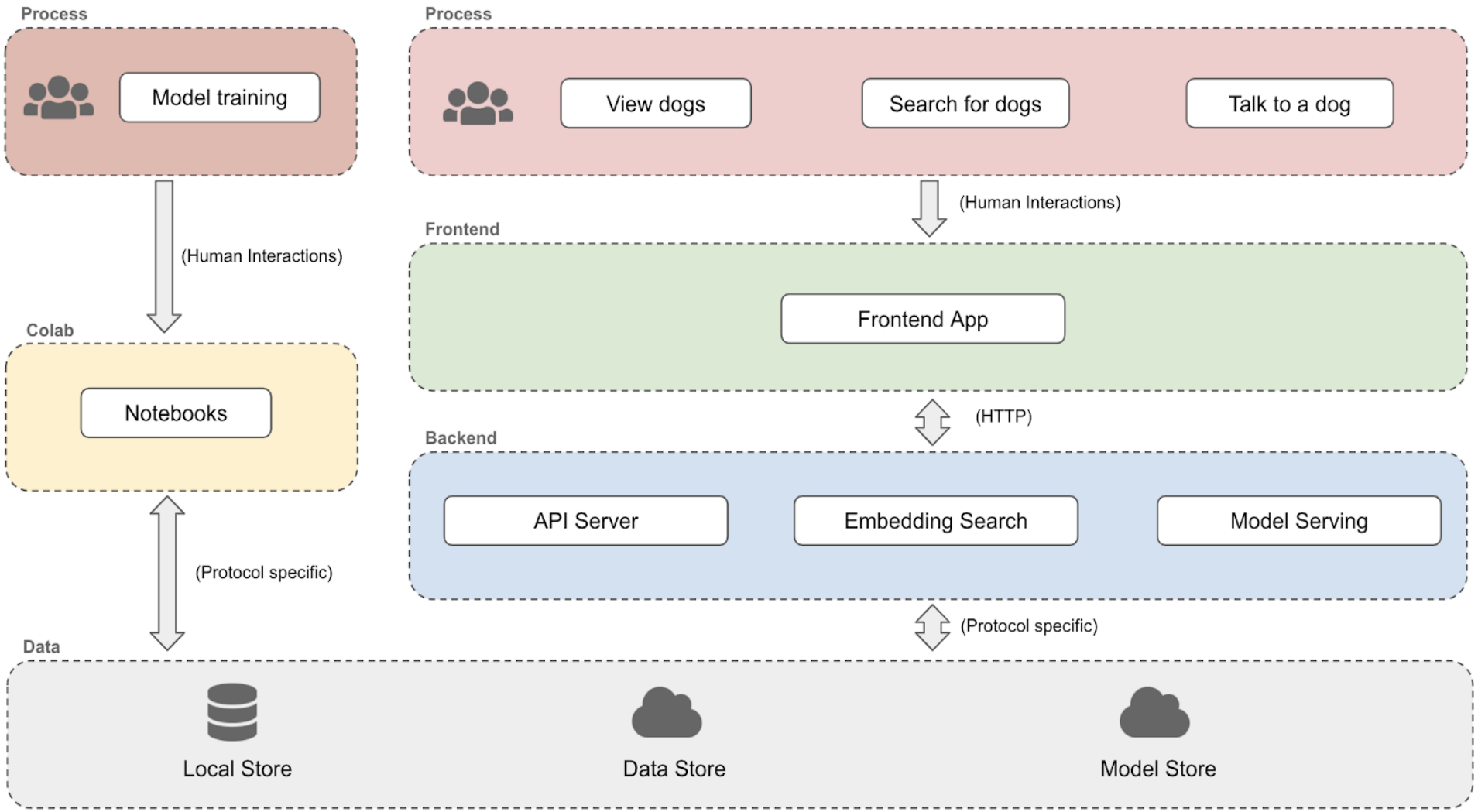
•All selected dogs + top “n” similar dogs are displayed in the image grid



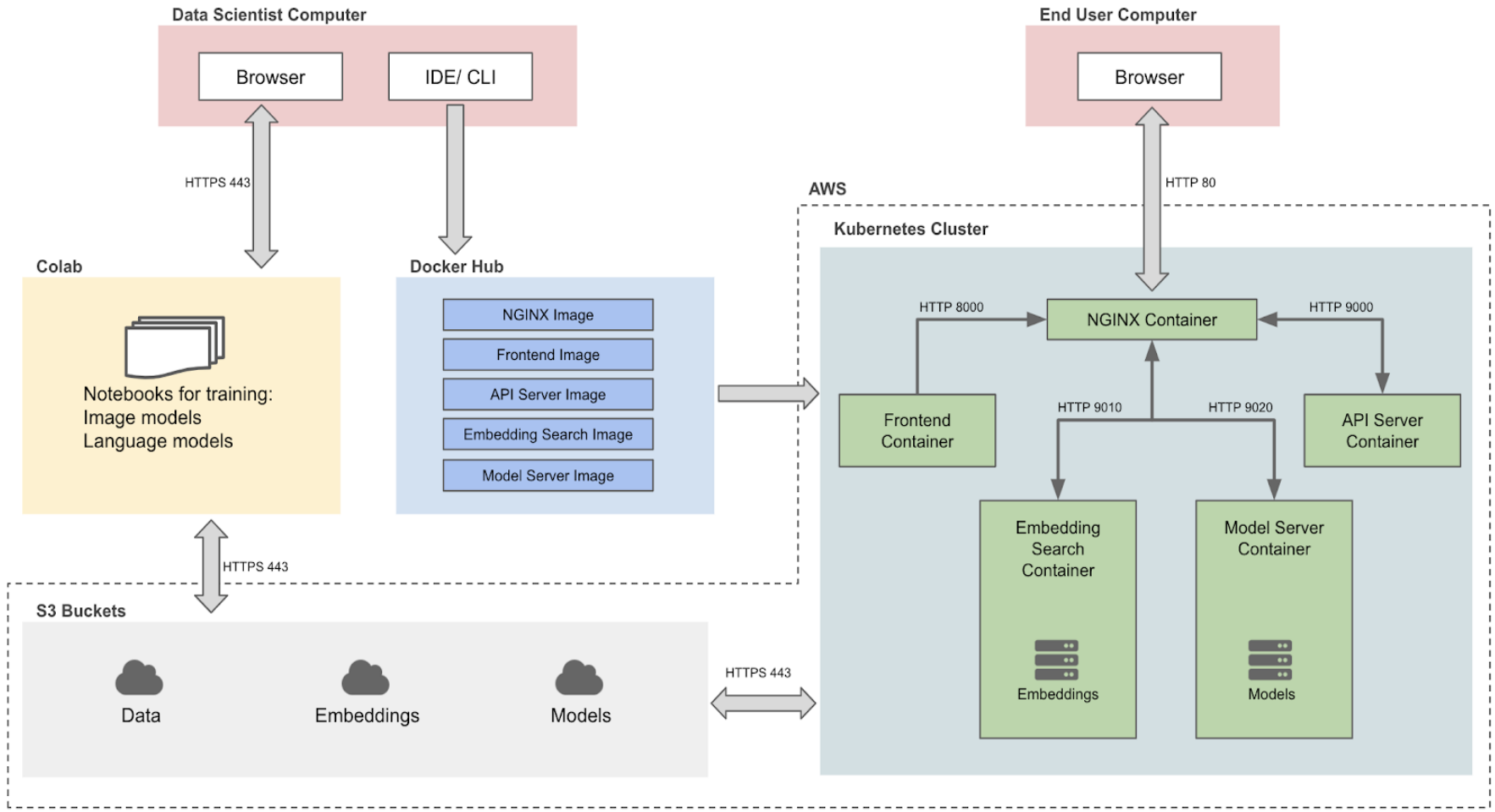
Select a dog to chat with it:

- Image cards in the image grid display a “chat” icon for each dog
- Click on “chat” icon to open up a chat popup
- The chatbot active will be specific to the dog selected
- Dog chat bot can answer basic question about itself + other general questions about the breed + some general question about dogs

Solution Architecture



Technical Architecture



Colab:
Google Colab will be used for model training of image and language models
Trained models will be saved in AWS S3 buckets

Docker Hub:
Docker Hub will be used to host all the container images

AWS S3 Bucket Store:
S3 buckets will be used as a common storage repositories for data, embeddings, and models

Kubernetes Cluster:
Kubernetes cluster will be used to deploy the various containers on AWS

DATA

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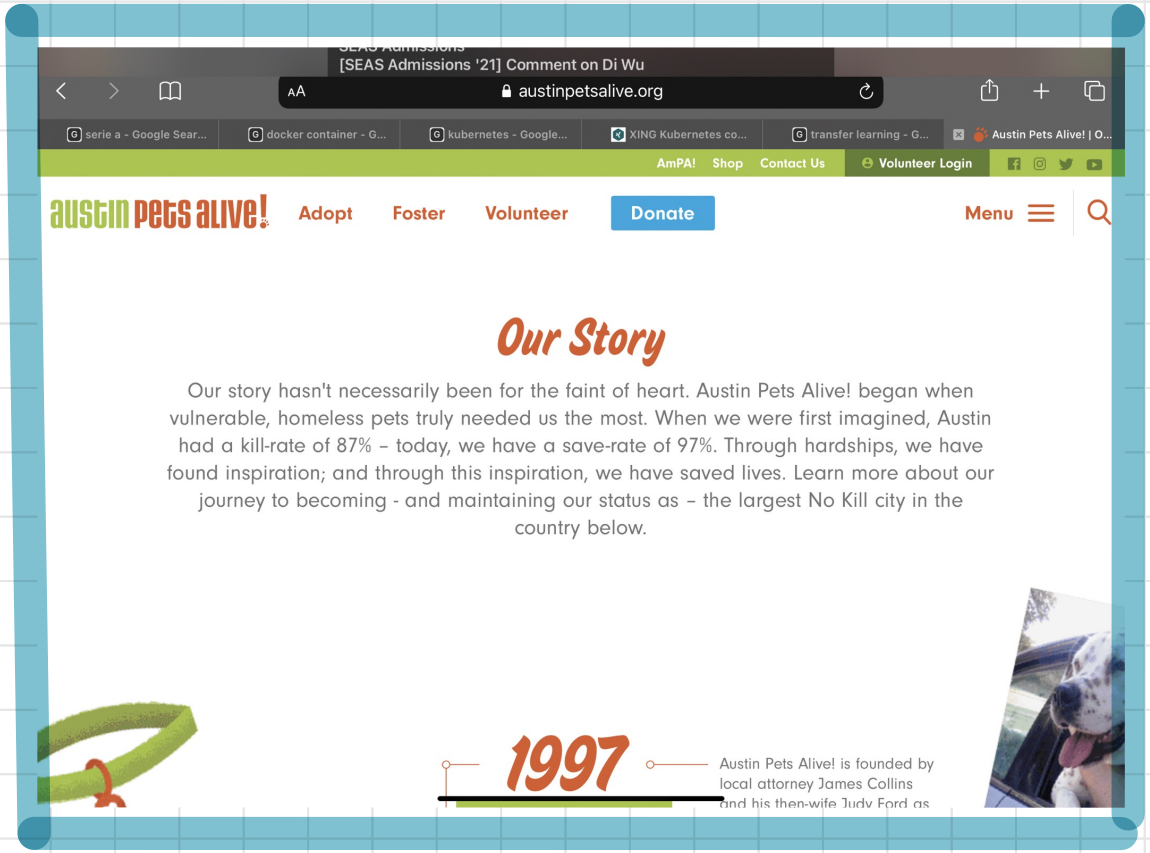
AUSTIN PET ALIVE



Steve Porter

THANK YOU

Provide the data and guidance

TAKE-AWAYS

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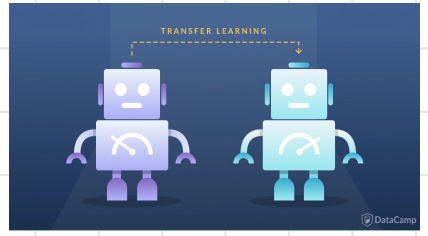
- Learn about transfer learning as it is applied to computer vision and language models.



- Learn how to containerized your applications using dockers.

docker

- Learn how to deploy your applications on cloud computing using Kubernetes.

EXTRA TAKE-AWAYS

- Scaffold for your application
- High quality starter code
- Network

DAY BY DAY

DAY 1:

Workshop will be on transfer learning for computer vision.

- Transfer learning
- Image Classification
- Network distillation

Pavlos Protopapas

Marios Mattheakis

DAY 2:

Workshop will be on transfer learning for language models.

- Language models
- Attention, self attention
- Transformers
- Bert

Chris Tanner

DAY 3:

Workshop will be on moving code from notebook to self contained enviroments

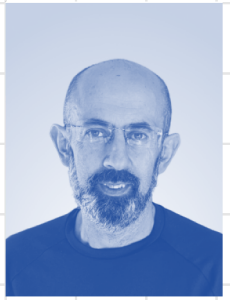
- Code optimization
- Containers
- Microservices/APIs

David Sondak

DAY 4:

Workshop will be on deploying containers to the AWS cloud environent.

- Kubernetes
- Amazon Web Services



Pavlos Protopapas

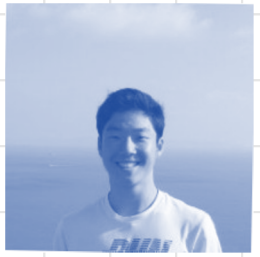
Organizers

Shivas Jayaram

Rashmi Banthia

Day 1:

Hyeden Joy



Henry Jin

Cathy Chute

Day 2:

Rohit Beri

Zhao Lyu

Eduardo Peynetti

Day 3:

Connor Capitolo

Mehul Smriti

Simon Warchol

GitHub, Discussion Forum and Workspace

- All notebooks, links to colab, lecture notes are:
  - https://github.com/Harvard-IACS/2021-ComputeFest

- Forum:
  - https://computefestforum.seas.harvard.edu

- Zoom:
  - Check you email for zoom ids and passwords

- Breakout Rooms:
  - https://app.sophya.world/s/ComputeFest/cafe
  - https://app.sophya.world/s/ComputeFest/join/ZV8Ouz8p/tfoffice
  - https://app.sophya.world/s/ComputeFest/join/CA0B2gpv/instructoroffice