AC 215 | *Presented by: Data Pets*

Data Pets: A closer  and Me

An End-to-End Approach leveraging Computer Vision, NLP to enable better Pet Adoption Matching

Part I

Context and Project Scope

I: Context and Project Scope

We focus on data science enablement for solution on matching dog lovers to dogs available for adoption

Market Status Quo

- According to *The List*, 60% of American households are dog lovers, accounting for >60M household as potential market
- Adoption on average takes 1-2 weeks, with majority of time spent on matching dogs

Our Business

- We aim to leverage big data and deep learning to create a user-friendly tool to match potential dog loving adopters/owners

Industry Challenge

- Not enough propagandization and information
- Not transparent communication and impersonal adoption experience
- Poor User Browsing/Searching Experience
- Time Consuming Process in Double Matching (dog-adopter) Process

Technical Approach

- Data Handling: Big Data Stored on GCP
- Computer Vision for enhancing picture quality
- NLP for dog persona creation and Chatbot for Question-Answering Task
- Docker/Kubernetes for App Depolyment

Source: The List & Rover.com

Part II

Data Science Technicalities

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II: Data Science Technicalities

Proposed Solution: Computer Vision

> Fig 1: Remove old and add new backgrounds with different effects

> Fig 2: Example Matched Images by using EfficientNet and FAISS embedding search

> Fig 3: Example Input Images that contains Dog-Irrelevant Features

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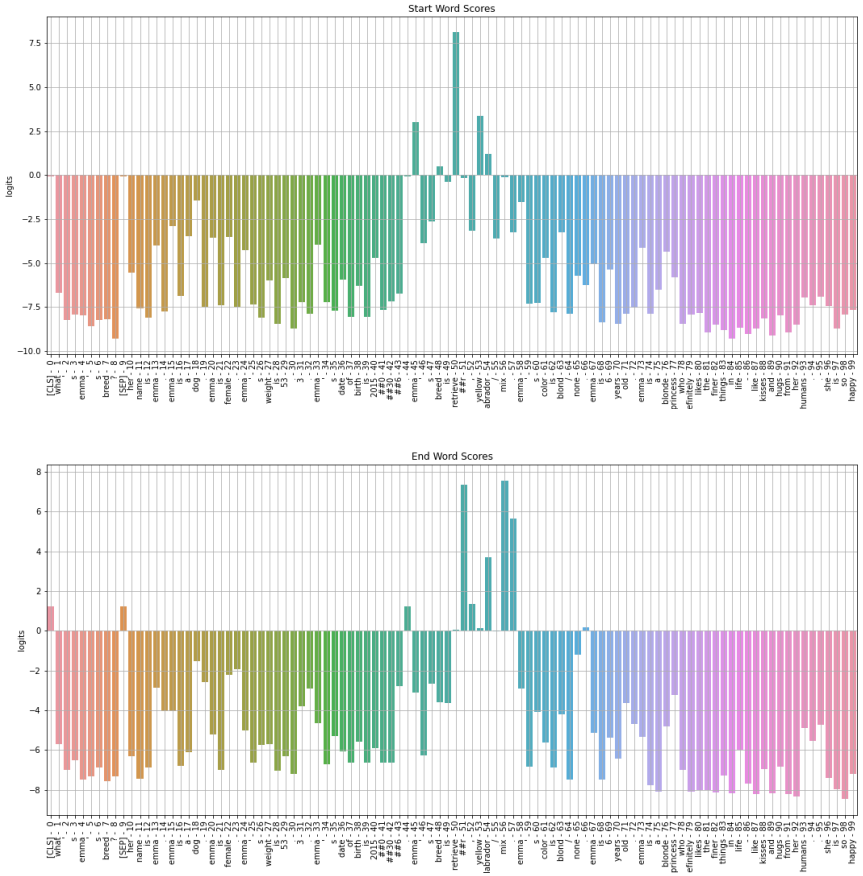
Computer Vision serves for following purposes:

- Remove Noisy Background from uploaded dog pictures using DeepLabv3 Plus
- Allow users to choose and add new background/effects
- Enhance the image if the solution of the uploaded picture is not ideal

II: Data Science Technicalities

Proposed Solution: Natural Language Processing

> Fig 1: Probability scores for start and end tokens predicted by BERT with an example question



NLP serves for following purposes:

- Enhancing the Creation of the Persona of the dog for better User Adoption Experience
- Enabling Chatbot Functionality for User to direct communicate
- Fulfilling Question-Answering Functionality

Part III

Limitations and Next Step

III: Limitations and Next Steps

We proposed solution as per each limitation

4 Ways to solve current limitations

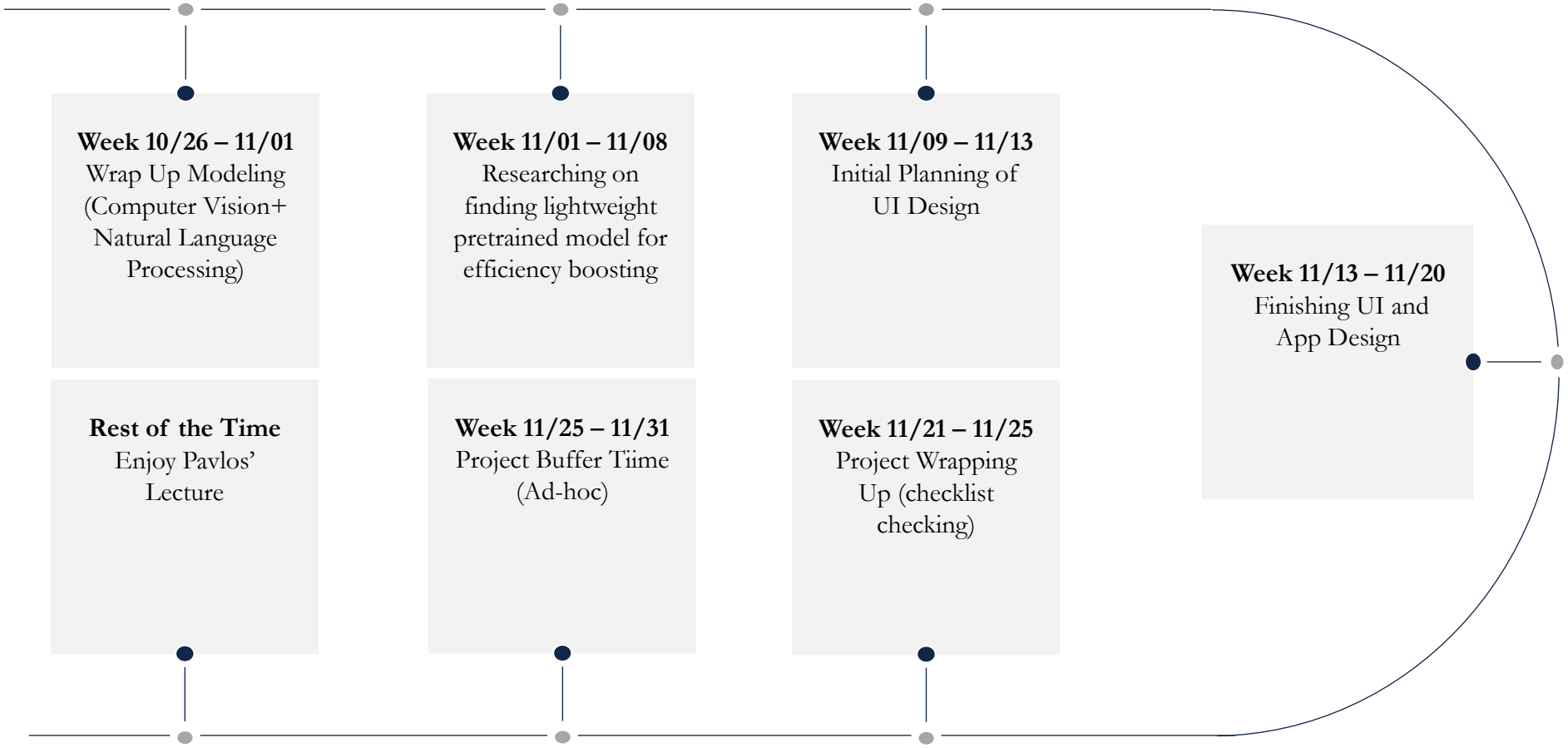
1. We plan on switching over to lightweight model for image segmenting so as to **reduce model running time**
2. We plan on switching over to GPT based language model to account for **incapability of BERT in language generation**
3. We plan on using Node JS for front-end and Oracle for back-end database for **better app design**
4. We plan to utilize Docker to containerize both applications and leverage it to GCP using Kubernetes **for better app deployment and setting**

Reference

Remaining Project Timeline

Remaining Project Timeline

Project Checklist



Reference: Contact Page

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