PlatePals

AC215 Presentation

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ABOUT
the project

01

101 Food Classes

cheese plate

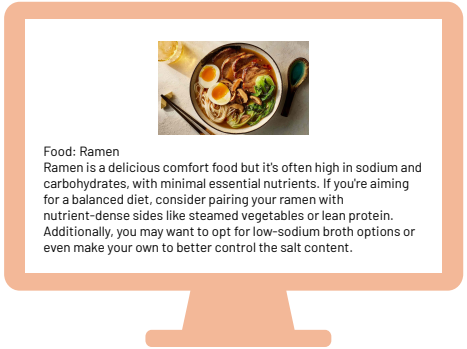
bibipbam

club sandwich

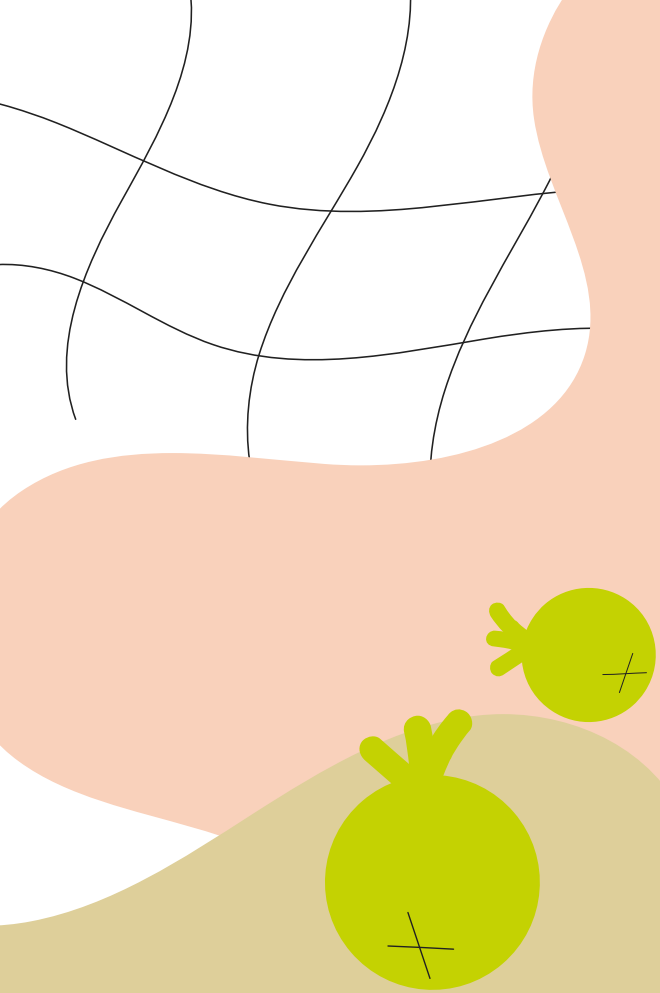
APP FLOW

User takes photo of food

User uploads the photo to our app



Our app identifies the food and gives dietary recommendations



What if the app **identifies the food wrongly?**

CHATBOT COMPONENT

BOT
Food: Fried Rice
Fried rice is a versatile dish that often contains a mix of carbohydrates, fats, and protein. However, it can be high in sodium and may contain ...

Our app identifies the wrong food

USER
I'm eating ramen, not fried rice.

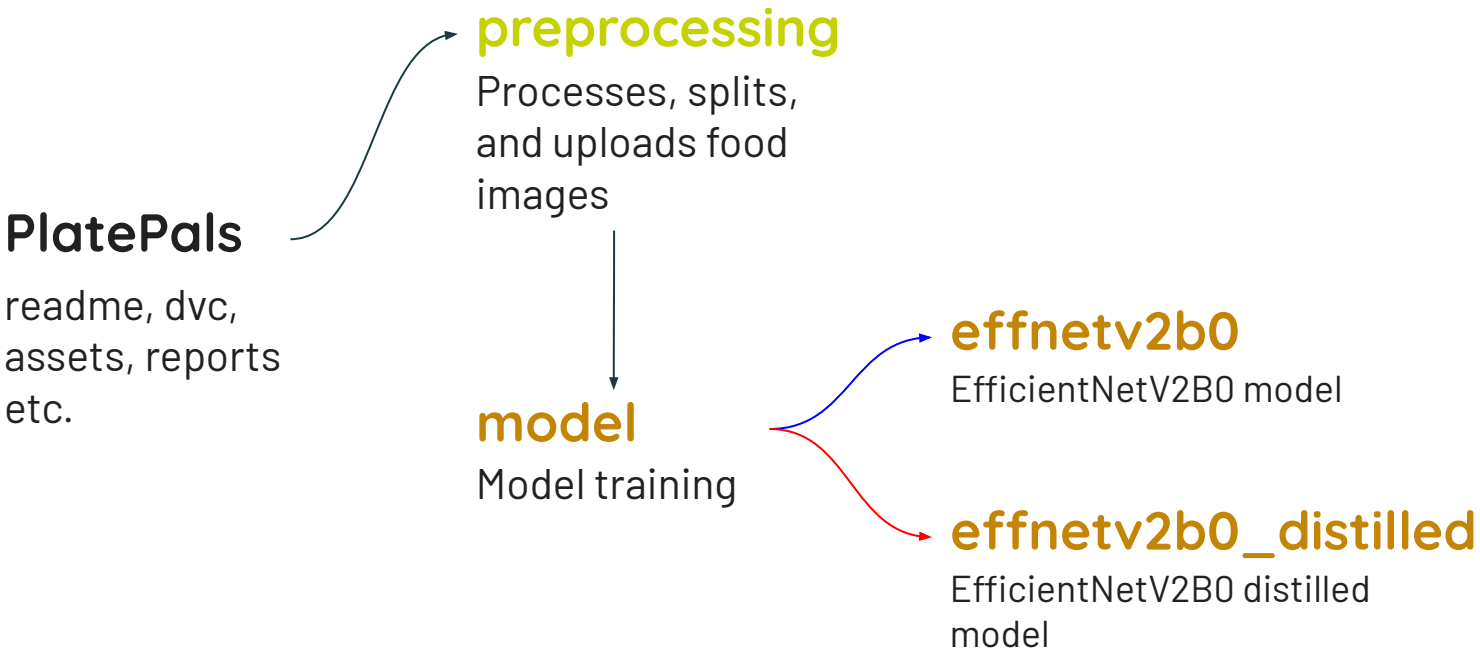
BOT
I'm sorry, in that case, Ramen is a delicious comfort food but it's often high in sodium and carbohydrates, with minimal essential nutrients. If you're aiming for a balanced diet, consider ...

User can correct the chatbot to get the correct dietary recommendations

02

PROJECT COMPONENTS

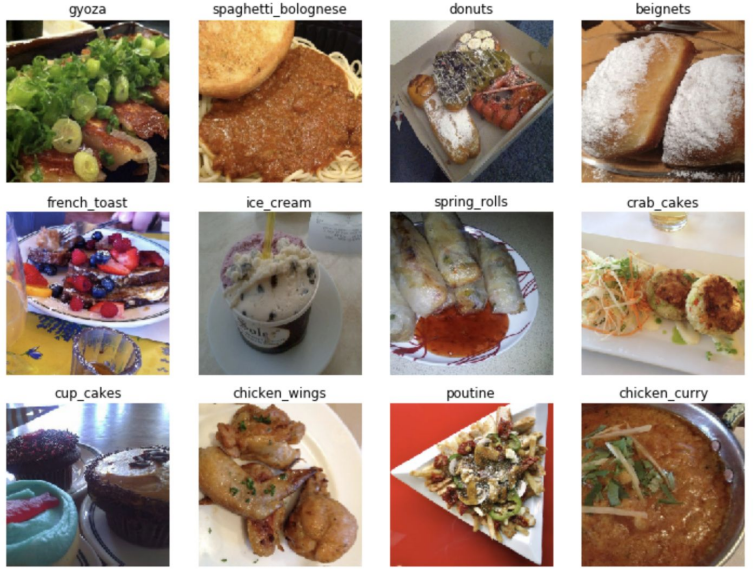
PROJECT ORGANIZATION



PREPROCESSING

Preprocess, split, and upload to GCS Bucket

1. Download the dataset from TF Datasets **(101,000 images)**
2. Resize to **128x128x3**
3. Image Augmentation:
   Flip, rotation, zoom, random height, random width, etc.
4. Train-test-split **(65 - 15 - 25)**
5. Zip, upload to GCS Bucket



MODEL: EfficientNetV2

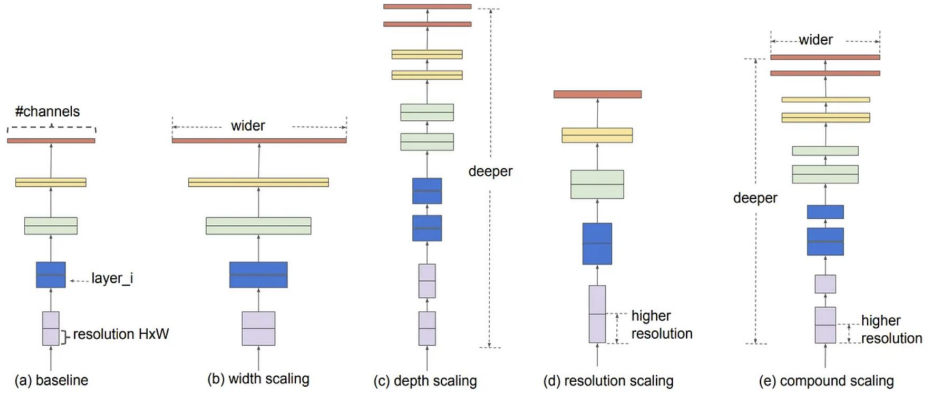
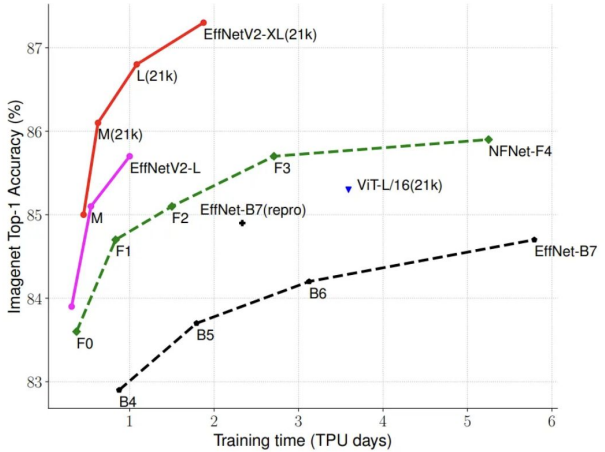


Figure 5. Scaling the depth, width, and image resolution to create different variations of the EfficientNet model

Compound Scaling of Model Width, Depth and Resolution



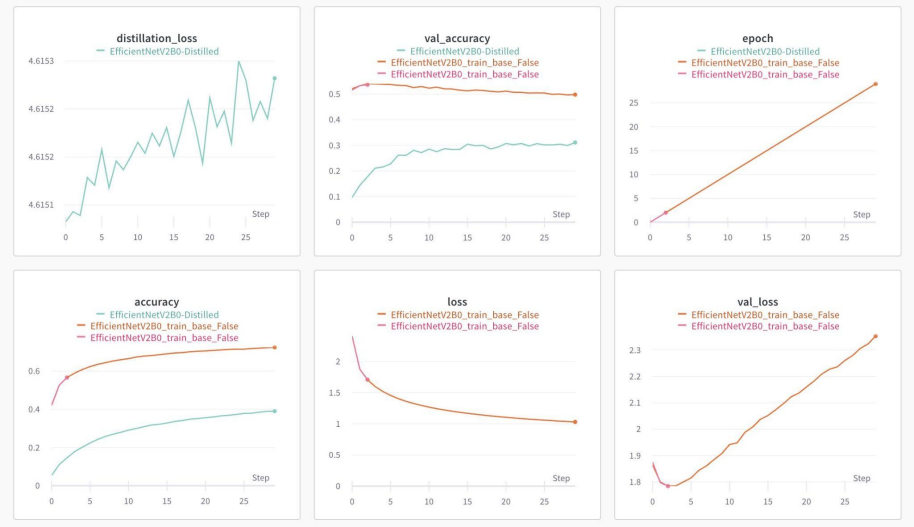
(a) Training efficiency.

	EfficientNet (2019)	ResNet-RS (2021)	DeiT/ViT (2021)	EfficientNetV2 (ours)
Top-1 Acc.	84.3%	84.0%	83.1%	83.9%
Parameters	43M	164M	86M	24M

(b) Parameter efficiency.

MODEL: EfficientNetV2

1. Model training code uploaded to GCS Bucket
2. Serverless training with Vertex AI
3. Experiment tracking through Weights & Biases



03

MODEL COMPARISON

EfficientNetV2B0 vs. Distilled

Metric comparison

	trainable_parameters	execution_time	loss	accuracy	model_size	learning_rate	batch_size	epochs	optimizer	name
0	129381	4.78 mins	1.78	54.27%	18.149 MB	0.001	32	3	Adam	EfficientNetV2B0
1	134629	6.62 mins	4.49	17.66%	0.563 MB	0.001	32	3	Adam	EfficientNetV2B0 Distilled

- **Model size:** distilled model is much smaller **(32x smaller)**
- **Accuracy:** distilled model has a much lower accuracy **(3.1x less accurate)**
- **Execution time:** distilled model takes longer to train **(1.4x slower)**

NEXT STEPS

01

USER-FACING APPLICATION

Build application that ties together the various components built in previous milestones (**web app** to upload food images, **chat** with user)

02

SCALABLE SOLUTIONS USING KUBERNETES

Using Kubernetes to scale our application to serve predictions for uploaded food pictures by user

03

ACCESSIBLE MODEL TO DIVERSE AUDIENCES

Ensure that the user experience is accessible to diverse audiences uploading food pictures (low barrier of entry, easy to use)

THANKS FOR LISTENING!

Any questions?