



PlatePals

AC215 Presentation

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ABOUT the project

01

101 Food Classes



cheese plate



bibipbam



club sandwich

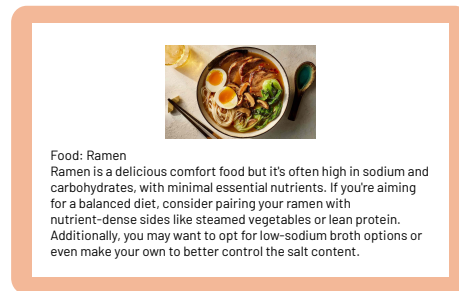
APP FLOW




User takes photo of food



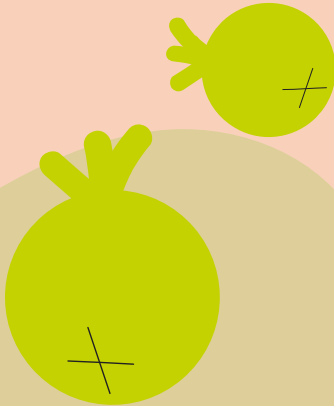
User uploads the photo to our app



Our app identifies the food and gives dietary recommendations

The background features a solid light orange color. On the left, there are abstract organic shapes in white and a muted olive green. Thin black lines are drawn over these shapes, creating a grid-like pattern in the white areas and simple line art for the green shapes. The text is positioned on the right side of the image.

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

A stylized illustration of a hand holding a drink with lemon slices and leaves. The hand is brown and holds a glass containing a light-colored liquid, ice cubes, and two lemon slices. Dark green leaves are also visible. The background is a solid light orange color with abstract white and green shapes, including a leafy branch on the left and a grid pattern on the bottom right.

02

PROJECT COMPONENTS

PROJECT ORGANIZATION

PlatePals

readme, dvc,
assets, reports
etc.

preprocessing

Processes, splits,
and uploads food
images

model

Model training

effnetv2b0

EfficientNetV2B0 model

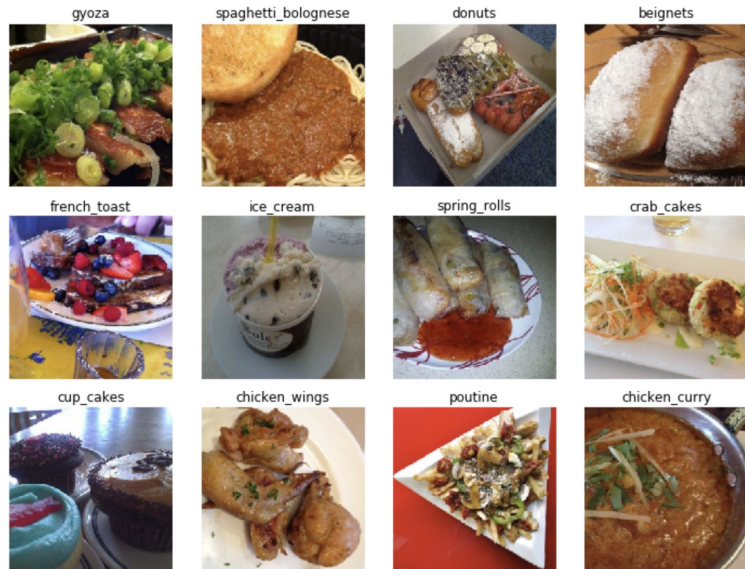
effnetv2b0_distilled

EfficientNetV2B0 distilled
model

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

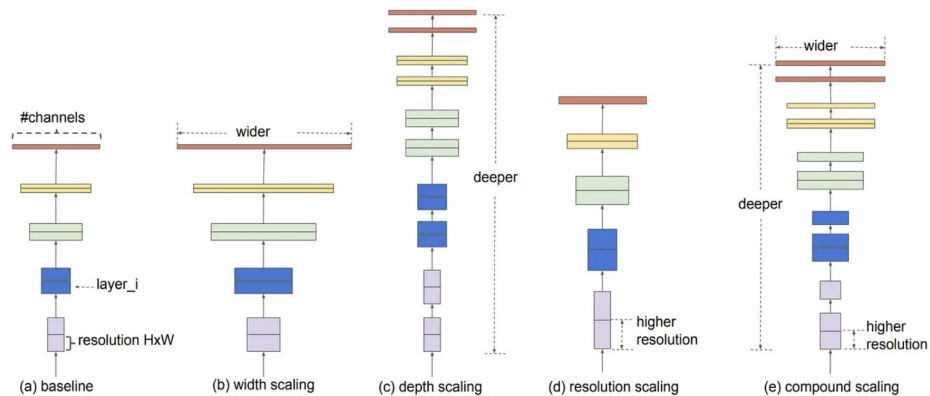
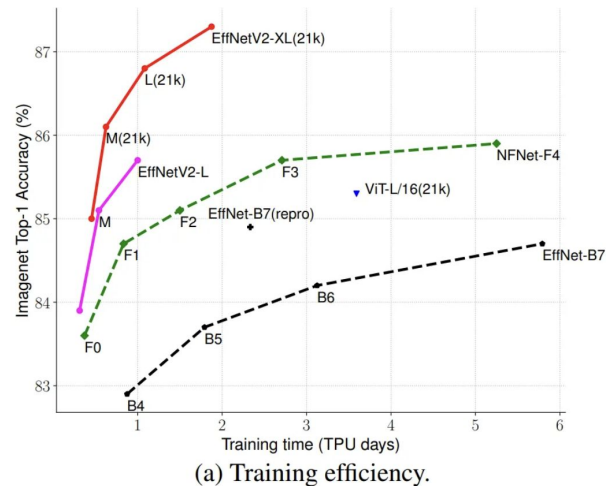


Figure 5. Scaling the depth, width, and image resolution to create different variations of the EfficientNet model

Compound Scaling of Model Width, Depth and Resolution

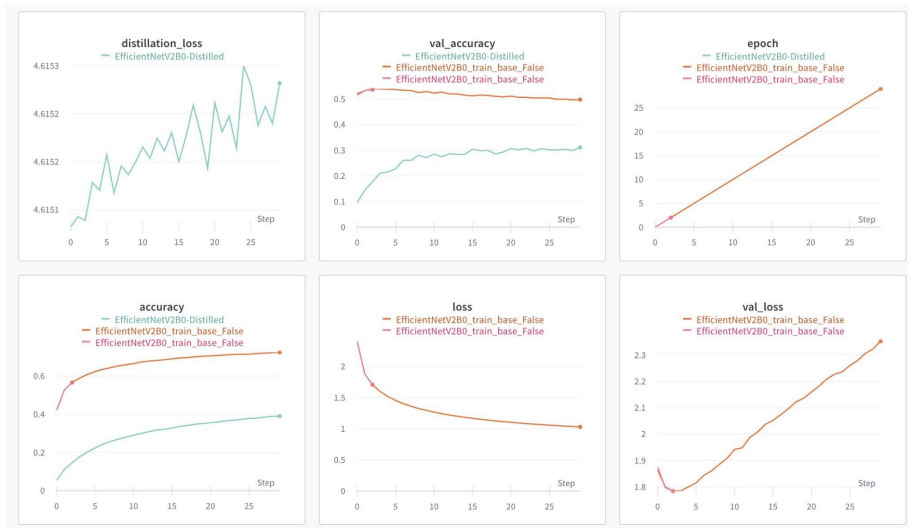


	EfficientNet (2019)	ResNet-RS (2021)	DeiT/ViT (2021)	EfficientNetV2 (ours)
Top-1 Acc.	84.3%	84.0%	83.1%	83.9%
Parameters	43M	164M	86M	24M

(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





MODEL COMPARISON

03



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)

An illustration on the left side of the slide shows a brown-skinned hand holding a glass filled with a light green beverage, ice cubes, and two lemon wedges. A dark green leaf is also in the glass. The background is a solid light orange color with various abstract shapes: a white leafy branch in the top left, a solid lime green shape in the top right, a white grid pattern in the bottom right, and a dark green leaf at the bottom center.

THANKS FOR LISTENING!

Any questions?