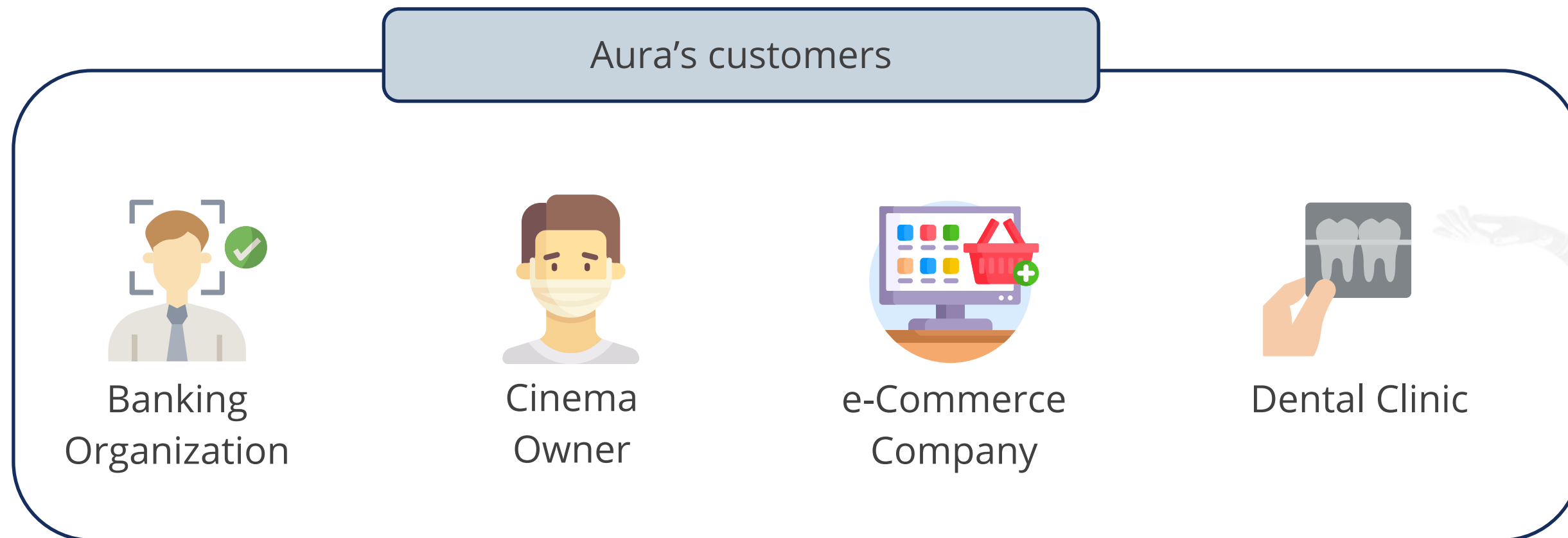**Capstone Session 10**

Deep Learning for Advanced Modeling

Deep Learning End Goal

The intuitive analyses of Aura must help customers make informed decisions to push relevant ads, services and products based on real-time user sentiments.

Aura's customers

Banking Organization

Cinema Owner

e-Commerce Company

Dental Clinic

Project Statement

Build necessary data aggregation, wrangling and visualization modules for Aura using the Healthcare dataset.

- Identify customers who churn the bank
- Detect humans wearing face masks
- Classify customer product reviews
- Denoise dirty documents

Week 10: Dataset Description

| Variable	Description
Image File Name	Name of the image file name
Class	The allowed values are: • "with_mask" • "without_mask" • "mask_worn_incorrect"

Week 10

Task: Build a Transfer Learning model to detect face masks on humans.
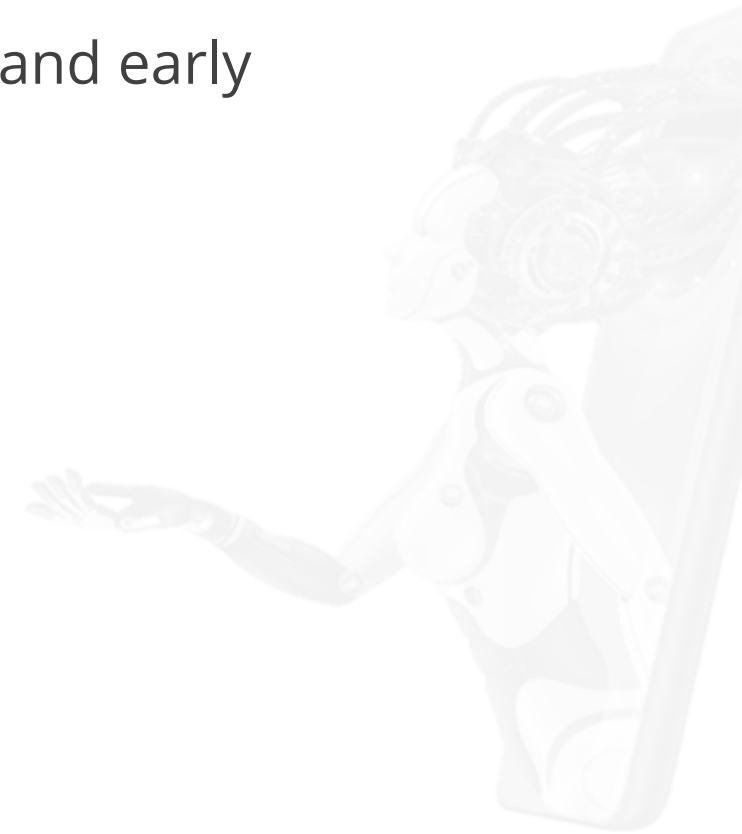
Task A:

- Load the Image Training and Test Datasets from the train and test folders respectively. Each image is of shape 128 x 128 x 3

- Load training dataset using Keras ImageDataGenerator with validation_split=0.2

- Load test dataset using Keras ImageDataGenerator

- Build a Transfer Learning network using Keras with the following layers

- Load EfficientNetB0 as first layers using Keras API.

- GLobalAveragePooling2D layer

- Dropout(0.2)

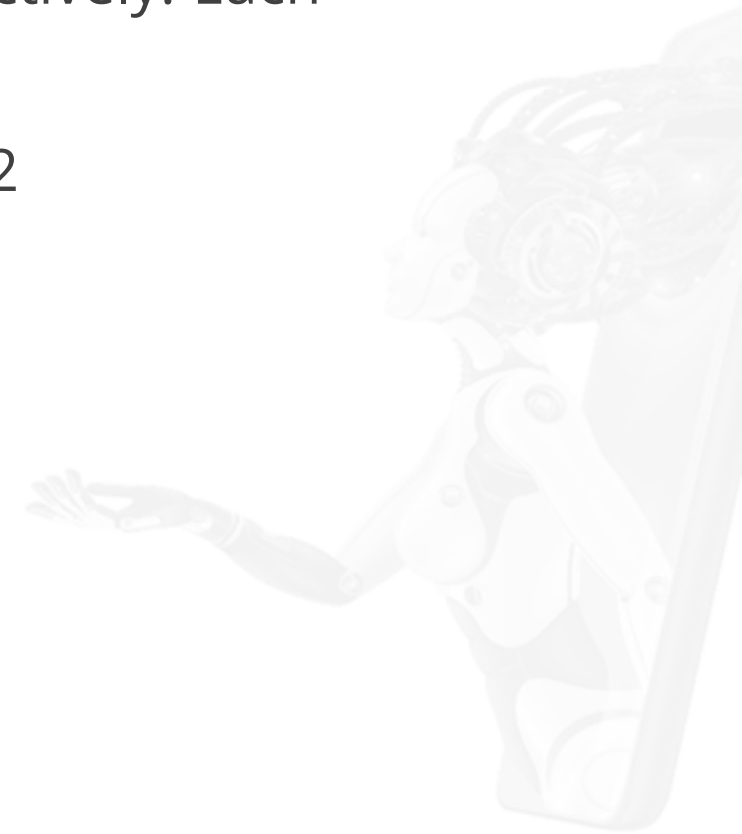- Dense layer with 3 neurons and activation SoftMax
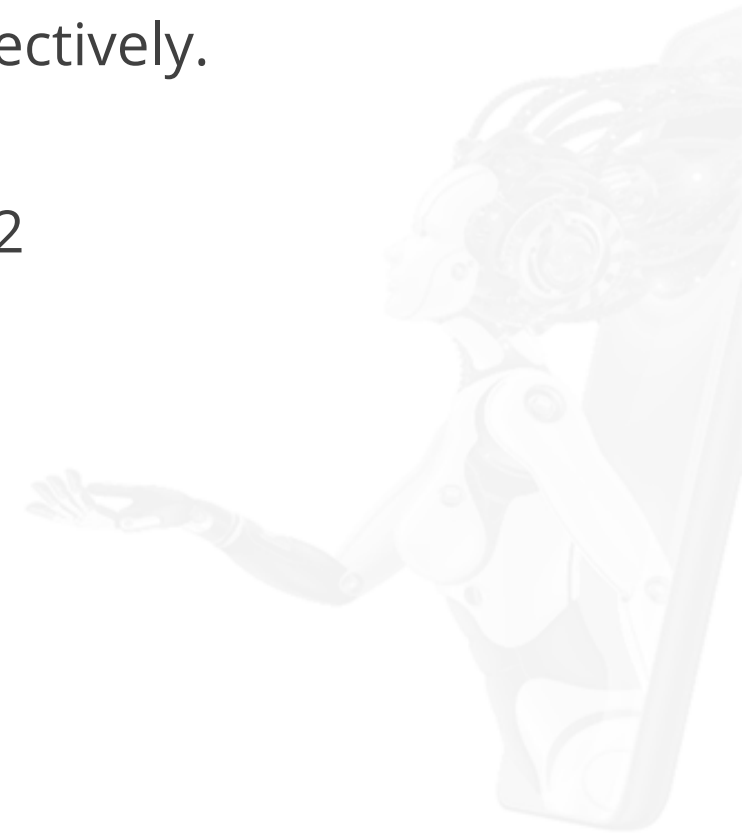
Week 10

- Compile the model with adam optimizer, categorical_crossentropy loss and with metrics accuracy.

- Train the model for 25 epochs with callbacks Reduce Learning Rate on Plateau and early stopping while monitoring validation loss

- Plot training and validation accuracy and loss against epochs

Week 10

Task B

- Load the Image Training and Test Datasets from the train and test folder respectively. Each image is of shape 128 x 128 x 3

- Load training dataset using Keras ImageDataGenerator with validation_split=0.2

- Load test dataset using Keras ImageDataGenerator

- Build a Transfer Learning network using Keras with the following layers

- Load ResNet50 as first layers using Keras API.

- GLobalAveragePooling2D layer

- Dropout(0.5)

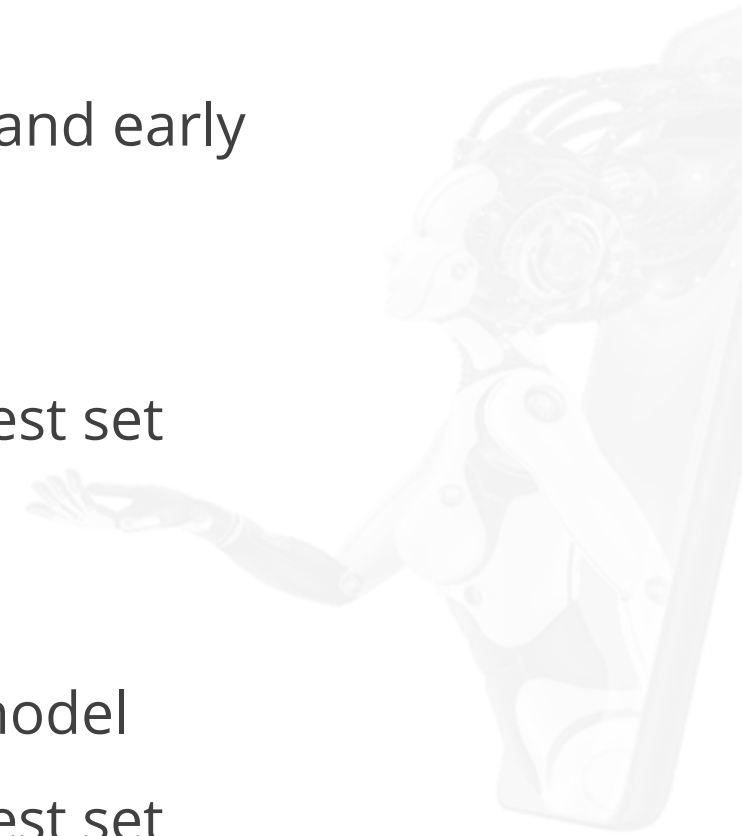- Dense layer with 3 neurons and activation SoftMax

Week 10

Task B

- Compile the model with Adam optimizer, categorical_crossentropy loss and with metrics accuracy.

- Train the model for 25 epochs with callbacks Reduce Learning Rate on Plateau and early stopping while monitoring validation loss

- Plot training and validation accuracy and loss against epochs

- Using the best model predict on the test dataset and plot 10 images from the test set along with its True Label and Predicted Label.

Task C

- Compare EfficientNetB0 and ResNet50 model performance and find the best model

- Using the best model predict on the test dataset and plot 10 images from the test set along with its True Label and Predicted Label.

Thank You