

TUWAIQ ACADEMY DEEP LEARNING

Develived as part of the week 6 activites

TEAM MEMBERS

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OUR DATASET

AIRLINE PASSENGER SATISFACTION

89127 ROW

23 COLUMN

Obtained from kaggle.

DATASET DESCRIPTION

- **Gender** – Passenger gender (0 = Female, 1 = Male).
- **Customer Type** – Type of customer (0 = Loyal, 1 = Disloyal / one-time).
- **Age** – Passenger age in years.
- **Type of Travel** – Reason for travel (0 = Business, 1 = Personal).
- **Flight Distance** – Distance of the flight in miles or km.
- **Inflight wifi service** – Rating of Wi-Fi service (1–5).
- **Departure/Arrival time convenient** – Rating of convenience of times (1–5).
- **Ease of Online booking** – Rating of online booking experience (1–5).
- **Gate location** – Rating of gate convenience (1–5).
- **Food and drink** – Rating of onboard food and drink (1–5).
- **Inflight entertainment** – Rating of entertainment (1–5).
- **Online support** – Rating of online support (1–5).
- **Leg room service** – Rating of legroom (1–5).
- **Baggage handling** – Rating of baggage handling (1–5).
- **Checkin service** – Rating of check-in service (1–5).
- **Inflight service** – Rating of overall inflight service (1–5).
- **Cleanliness** – Rating of cleanliness (1–5).
- **Departure Delay in Minutes** – Minutes delayed at departure.
- **Arrival Delay in Minutes** – Minutes delayed at arrival.
- **Satisfaction** – Customer satisfaction (0 = Not satisfied, 1 = Satisfied).
- **Class_Eco** – Boolean flag if passenger is in Economy class.
- **Class_Eco Plus** – Boolean flag if passenger is in Economy Plus class.

Four Dense layers, with regularization

RELU activation functions, and sigmoid
for the output layer

We used adam optimizer, and loss:
binary_crossentropy, with Batch
normalization

1

THE BEST ARCHITECTURE

on the neural network model

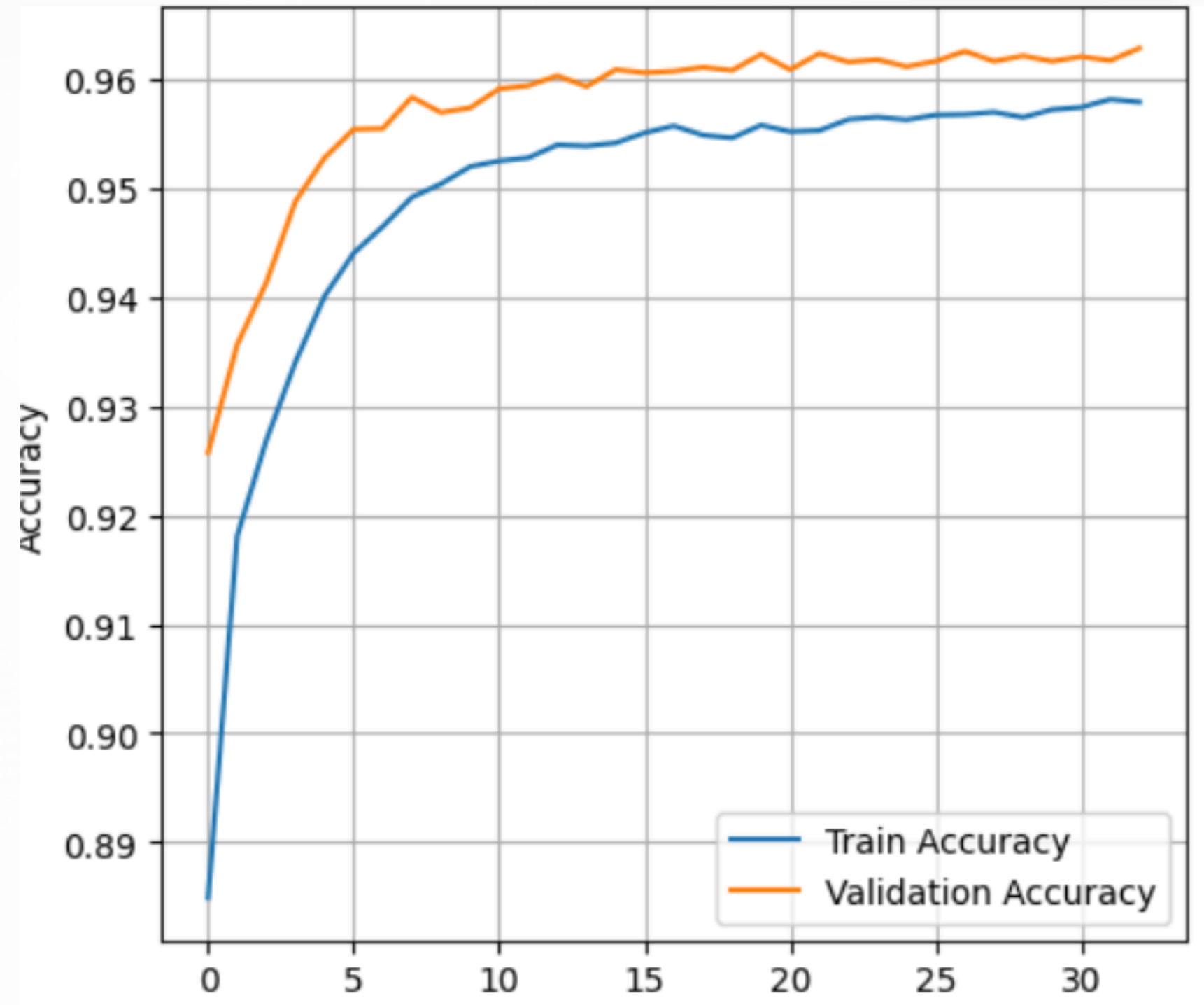
2

96% Accuracy

3

RESULTS

our obtained results displayed using
Matplotlib



MODEL BUILDER & FIT STATUS MONITOR

MODEL BUILDER

- A reusable function that builds and compiles neural networks dynamically.
- Accepts parameters for optimizer, loss, learning rate, and dropout, allowing easy experimentation.
- Supports single or dual dropout values (d_1 , d_2) for layer-wise flexibility.

FIT STATUS MONITOR

- Custom Keras callback that evaluates model fit per epoch.
- Provides real-time feedback during training, making it easier to detect imbalance between learning and generalization.

OUR INSIGHTS

Adam optimizer consistently achieved the best balance between accuracy and generalization.

Dropout (0.3, 0.5) provided the most stable performance, reducing overfitting without slowing learning too much.

RMSprop converged quickly but plateaued with slightly lower validation accuracy.

SGD with momentum required more epochs to stabilize but produced smoother learning curves.

FitMonitor accurately flagged overfitting in early runs, guiding dropout and learning-rate adjustments.

Final Model Accuracy: $\approx 94\%$ on validation and test sets — with “Fit Status: Just Right.”

Interpretation: The model learned meaningful passenger satisfaction patterns, especially from in-flight service, cleanliness, and class-related features.



THANK YOU

