Airline Passenger Satisfaction

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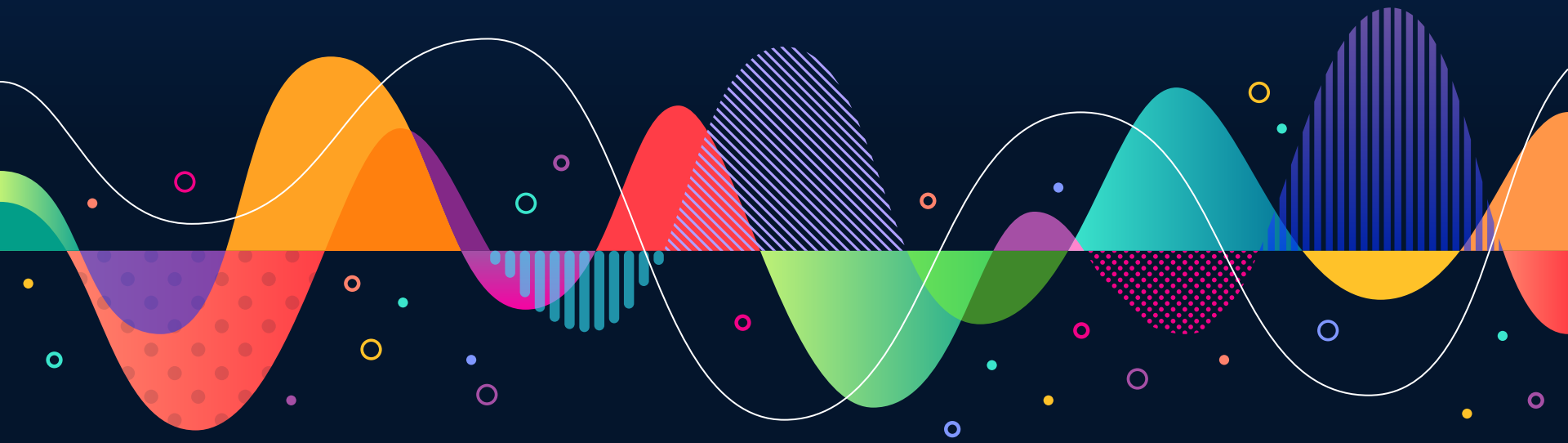


Problem

- Passenger satisfaction and loyalty depends on a huge number of factors including pre-flight, in-flight and post-flight services (Namukasa, 2013)
  - How can we determine which factors affect the most?
  - How can we predict customer satisfaction by changing certain factors

Dataset

- Airline Passenger Satisfaction from Kaggle
- 103904 surveys about customer satisfaction for training purposes
- 25976 surveys for testing purposes
- 26 features
- 2 classes (“neutral or dissatisfied” and “satisfied”)

Features

- Gender
- Customer Type
- Age
- Type of Travel
- Class
- Flight distance
- Inflight wifi service:
- Departure/Arrival time convenient
- Ease of Online booking
- Food and drink
- Online boarding
- Seat comfort
- Inflight entertainment
- On-board service
- Leg room service
- Baggage handling:
- Check-in service:

Preprocessing

1. Data exploration
    a. Check for missing values
        i. Drop rows
2. Convert from categorical to numerical
        i. Replace [“neutral or dissatisfied” and “satisfied”] with [0, 1]
        ii. One hot encoding of the following columns ’Gender’, ’Customer Type’, ’Type of Travel’, ’Class’

Architecture

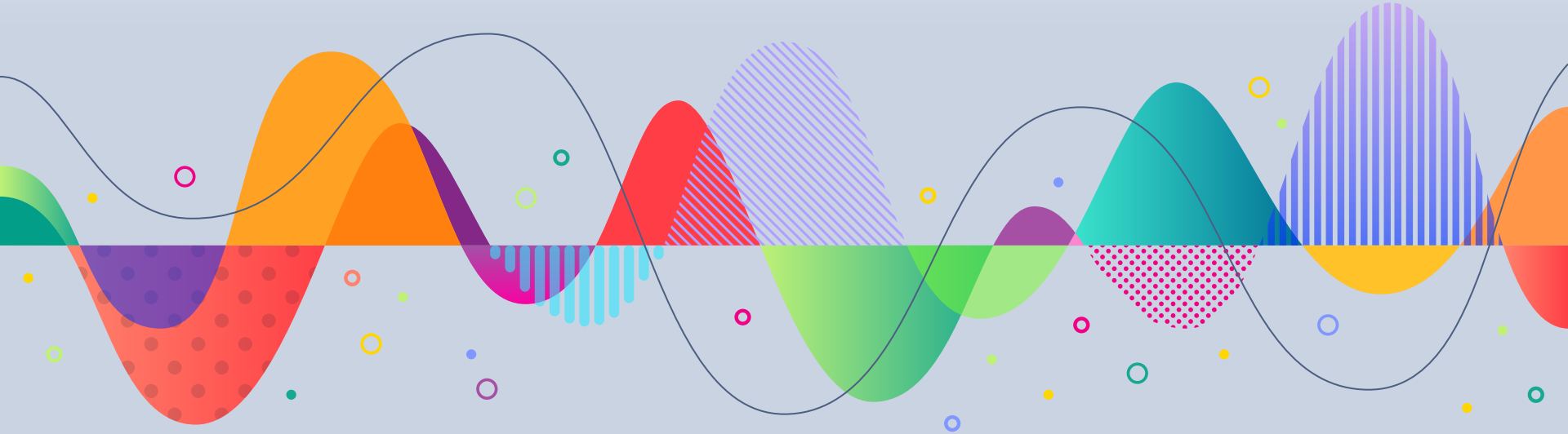
Process to determine the right architecture:

1. Use a framework to create a simple neural network
2. Overfit the model
3. Reduce the complexity

Results:

- The model was performing well with a simple architecture
- About 85% to 90% of accuracy
- More complexity != more accuracy

Neural Network Without a Framework



Resources


Fundamentos de
Deep Learning
con Python y PyTorch
Red Neuronal
Python
¡desde Cero!


Red Neuronal
Python
¡desde Cero!
Parte 2
Fundamentos de
Deep Learning
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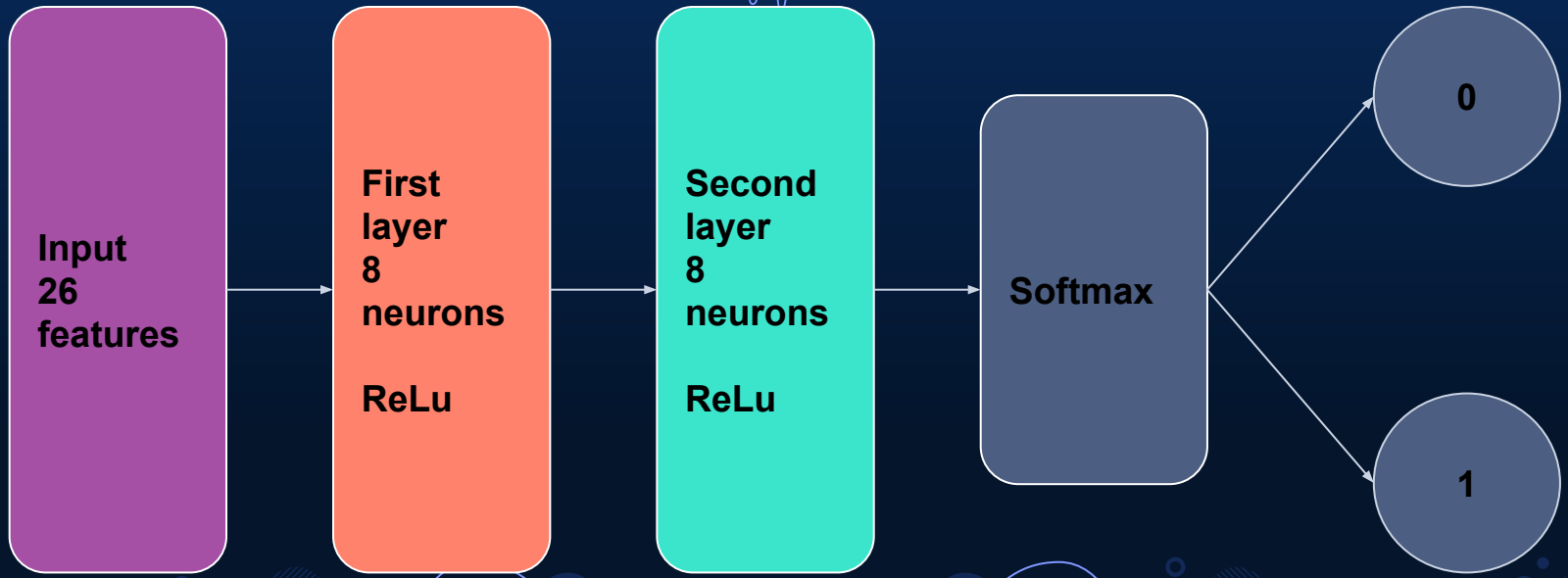
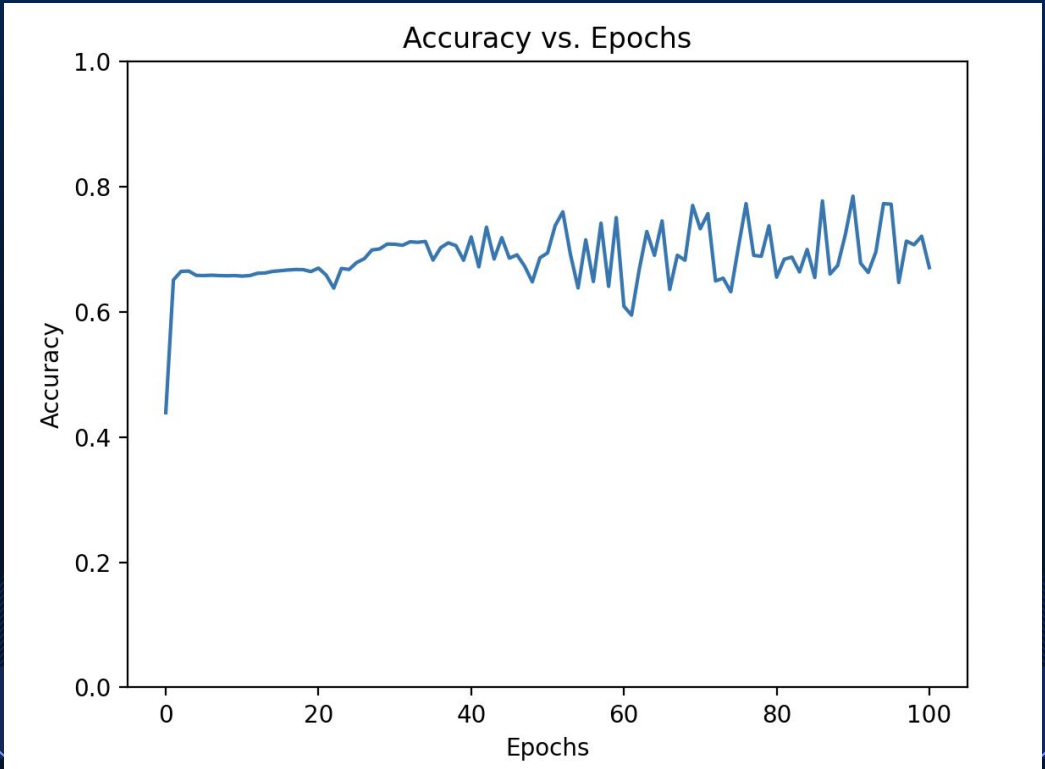
Architecture



Training Problems

- Very slow learning
  - Can be related to the way I am initializing the parameters
  - Small learning rate
  - Simple architecture
- Difficult to determine the best hyperparameters for the architecture

Model Performance



Conclusions

- Problem with binary classification
  - neutral or dissatisfied
- The model is too simple
  - Similar validation accuracy and testing accuracy

References

- Namukasa, J. (2013), "The influence of airline service quality on passenger satisfaction and loyalty : The case of Uganda airline industry", The TQM Journal, Vol. 25 No. 5, pp. 520-532. https://doi.org/10.1108/TQM-11-2012-0092