Aditya Deshmukh
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Education

Degree	Institution	CPI/%	Year
B.Tech	IIT Gandhinagar	8.02	2021 - Present
Class XII	Shelgaon High School	89	2020-2021
Class X	MIT Barshi	92	2018-2019

Projects

- **Build ChatBot for BigFig.AI** [Oct'23-Jan'24]
  - Developed a conversational chatbot using LangChain and OpenAI APIs to provide customized responses to users.
  - Architecture was based on chaining and routing mechanisms, enabling precise handling of specific user requests. Chaining facilitated the sequential execution of responses, ensuring a coherent conversation flow.
- **CartPole Balancing using Reinforcement Learning** [Aug'23-Sep '23]
  Mentor : Samarth Brahmbhatt, Intel Labs and Prof. Vinnet Vashishtha
  - Developed a **Deep Q Learning** agent to play the CartPole-v0 environment in **OpenAI Gym** using PyTorch.
  - Constructed a neural network with input, hidden, and output layers to approximate the Q-function.
  - In around 7000 episodes it was able to surpass human level performance.
- **Dino Game using Deep Q Network Algorithm** [Sep'23-Oct '23]
  - Implemented Deep Q-Learning agent to play the Dinosaur game environment built using **PyGame**.
  - **Engineered the state** representation to compactly capture key information like position of dinosaur, obstacle distance, game speed etc for effective learning.
  - **Designed an incremental reward system** that provided the agent with positive rewards for survival time and obstacle crosses while penalizing collisions. This shaped agent behavior towards successful gameplay.
- **Music Generation using RNN(Recurrent Neural Network) |** *Project Link* [Nov'22-Jan '23]
  - **LSTM Model:** Constructed sequential model comprising Embedding layer, LSTM layer, and Dense layer. Embedding layer converted character indices into dense vectors,and LSTM layer captured sequential dependencies in the input data. The Dense layer predicted the next character in the sequence.
  - **Loss Function and Training**: Employed the sparse categorical cross entropy loss function suitable for discrete character predictions. Developed a custom training step that calculated gradients using backpropagation and applied them to update the model's weights.
  - Model takes a starting input and generates music that follows the patterns learned during training.
- **Sentiment analysis on Stanford Treebank Dataset |** *Project Link* [Sep'22-Nov '22]
  - Conducted sentiment analysis on the Stanford Treebank Dataset.To enhance the predictive accuracy, implemented an **ensemble learning** approach that combined the outputs of three different models.
  - Executed a range of neural network architectures, encompassing an **self-attention model**. Additionally, designed an LSTM to effectively capture long-range dependencies.

Positions of Responsibility

- **Tech Team Member, Amalthea IIT Gandhinagar ' 22** (Annual Technical Summit - IITGN) [May'22-Jan '23]
  - Developed official website for Amalthea. Leveraged tech stack including HTML, CSS to create a dynamic and visually captivating website that showcased the event's innovation and excellence.

Achievements

- Achieved **10/10** in the DSA1 course, demonstrating deep understanding of Data Structures and Algorithms.
- Made first open source contribution to Ivy Unify Code, one of the leading startups in the ML domain.
- Upcoming summer internship at Accenture
- Got an offer for a role of founding engineer at a very early stage.

Skill Summary

- **Languages** Python, HTML, CSS, C++.
- **Tools** Numpy, Pandas,Matplotlib, Tensorflow, PyTorch, Keras, Myosuite, OpenAI Gym
- **Courses** DSA1, Supervised ML , Advanced Learning Algorithms