MSc CMEE Project Proposal

Developing NFTs for sparrows

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Introduction

Non-fungible token (NFT) represents data stored on the blockchain, a type of of digital ledger. As NFT is non-fungible, it is unique, non-interchangeable, and irreplaceable [Nadini et al., 2021] [Pinto-Gutiérrez et al., 2022]. Each token is one of a kind, making NFT particularly suitable for certifying and tracking ownership of unique assets [Nadini et al., 2021]. The initial NFTs were built on the Ethereum blockchain but they have now expanded to other blockchains [Nadini et al., 2021] [Arora et al., 2022]. A smart contract stores the information needed to carry out an NFT transfer on the blockchain [Arora et al., 2022].

The existing Lundy House sparrow database includes various entries about the sparrows; however, there is no unique artwork associated with any of the sparrows. To automate the process of art creation, the machine learning model called generative adversarial network (GAN) will be used [Shahriar and Hayawi, 2021]. GAN is a deep learning framework involving two neural network-based models known as generators and discriminators [Aggarwal et al., 2021]. The generator network synthesizes new candidates which will then be evaluated by the discriminator; the discriminator examines whether the data are from the real distribution or generated by the generator [Aggarwal et al., 2021]. The two networks are trained simultaneously, the goal is for the generator to fool the discriminator into thinking that candidates are not synthesized about half of the time [Shahriar and Hayawi, 2021] [Aggarwal et al., 2021]. GAN will be used to superimpose different art styles onto the sparrow photos [Zhang et al., 2017].

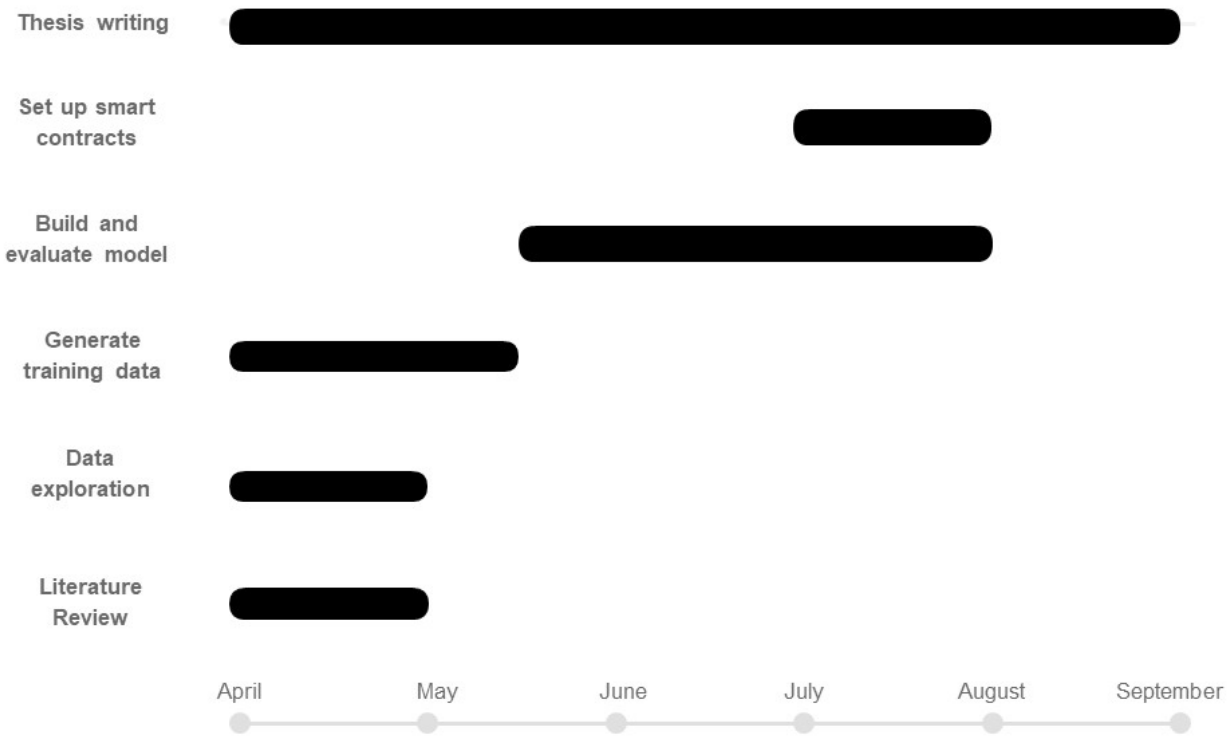
Methods

Example images for style transfer will be obtained from the NFT art collection. CycleGAN, an image-to-image translation model, will be tested first to see if the art style is successfully transferred to the target images. The model will be Python-based. NFT smart contracts will be written in JavaSript and deployed to the Stellar blockchain.

Project Aims

- Build a model which can change the style of the target image based on another image.
- Deploy NFT smart contracts on the blockchain.

Timeline



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