Phase 1 – Conception Phase

Title: MetroMorph - A generative urban city planner

Abstract

As the cities are growing rapidly, it has become more difficult for city planners to design the layout of the city in well organized way. Traditional planning methods take a lot of effort and time and depend on human experience in the field. They also find it difficult to counter all the factors such as population, terrain, traffic and pollution. Due to these issues, many cities struggle with daily problems like traffic jams, poor layouts, and less green zones. This project introduces an AI based system called Generative Urban Planner that can automatically create city layouts using population and terrain data. It uses Graph neural Networks (GNNs) to design roads structures and patterns. It uses Diffusion models to generate clear and realistic visual maps of the city. The system also uses optimization techniques to reduce traffic and population and pollution while increasing green and open areas. The main goal of this project is to build a smart and data driven tool that helps city planners and researchers quickly test and compare different city designs. The expected outcome is a system that can create sustainable, efficient and friendly urban layouts.