

**MVJ COLLEGE OF ENGINEERING, BENGALURU-560067**

**(Autonomous Institution Affiliated to VTU, Belagavi)**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
(DATA SCIENCE)**

**CERTIFICATE**

Certified that the major project titled “**URBAN SHIFT DYNAMICS: SATELLITE BASED DEEP LEARNING FOR GEOGRAPHIC INTELLIGENCE**” is carried out by **CHAITHRA SHREE D M (1MJ21CD008), HAMSAVENI D S (1MJ21CD014), HARPITHA B (1MJ21CD015), CHAITHANYA L (1MJ20CD045)** Who are confide students of MVJ College of Engineering in partial fulfilment for the award of degree of **Bachelor of COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)** of the Visvesvaraya Technological University Belagavi during the year 2024-2025. It's certified that all corrections/suggestion indicated for the internal assessment have been incorporated in the major project report deposited in the department library. The major project report has been approved as it satisfied the academic requirements in respect of major project work prescribed by the institution for the said Degree.

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### **DECLARATION**

**CHAITHRA SHREE D M (1MJ21CD008), HAMSAVENI D S (1MJ21CD014), HARPITHA B (1MJ21CD015), CHAITHANYA L (1MJ20CD045)** students of eight semester B.E., Department of Computer Science And Engineering(Data Science), MVJ College of Engineering, Bengaluru, hereby declare that the major project titled “**URBAN SHIFT DYNAMICS: SATELLITE BASED DEEP LEARNING FOR GEOGRAPHIC INTELLIGENCE** ” has been carried out by us and submitted in partial fulfilment for the award of Degree of Bachelor of Engineering in **COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)** during the year 2024- 2025.

Further we declare that the content of the dissertation has not been submitted previously by anybody for the award of any Degree or Diploma to any other University.

We also declare that any Intellectual Property Rights generated out of this project carried out at MVJCE will be the property of MVJ College of Engineering, Bengaluru and we will be one of the authors of the same.

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# ABSTRACT

This project introduces an AI-driven Urbanization Chatbot designed to serve as an interactive platform for exploring topics related to urban growth, smart city development, and sustainability. With increasing rates of urbanization around the world, there is a growing need for accessible tools that can assist individuals, students, planners, and policymakers in understanding the complex dynamics of city expansion and infrastructure planning. The chatbot aims to fill this gap by combining natural language processing with advanced data analysis and visualization techniques. The system architecture comprises two main components: a frontend built using Angular that facilitates user interaction through a clean and intuitive interface, and a backend developed using FastAPI, which handles query processing, data management, and model inference. The backend integrates a deep learning model inspired by the U-Net architecture, trained to analyze satellite imagery and detect patterns in land use and urban sprawl. This enables the system to provide visual insights into how cities are growing and evolving over time. To further enhance the chatbot's functionality, geospatial and demographic data are incorporated into the analysis. Population statistics and location-based attributes are used to generate interactive maps that visualize urban density, distribution, and key development zones. These maps, created using visualization tools such as Folium, allow users to explore global urban trends in a dynamic and informative manner.

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