PRESERVATION AND CONSERVATION OF PUSHKARNIS IN DAKSHINA KANNADA ZONE THROUGH COMPUTER VISION

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Introduction:

Pushkarnis, also known as temple tanks, are historically and culturally significant water structures found in the Dakshina Kannada region of Karnataka. These structures have served religious, ecological, and community purposes for centuries. However, due to rapid urbanization, environmental pollution, and lack of systematic maintenance, many Pushkarnis are deteriorating. Traditional monitoring methods rely heavily on manual inspection, which is time-consuming, inconsistent, and prone to human error. There is a growing need for an automated, scalable, and efficient system to assess the condition of these heritage structures. This project proposes a computer vision–based framework that leverages deep learning techniques to analyze images of Pushkarnis. The system detects structural damages such as cracks and erosion, evaluates water quality indicators like algae growth, and classifies architectural styles. By integrating artificial intelligence with heritage conservation, the project aims to provide a modern solution for preserving these culturally important water bodies while improving monitoring efficiency and accuracy.

Objectives:

1. To create a dataset of Pushkarnis from the Dakshina Kannada region.
2. To preprocess and standardize image data for analysis.
3. To develop deep learning models for classification and Identification of signs of deterioration water quality, architecture and cracks that need conservation action.
4. To Offer solutions based on Prediction of DCNN Models for the long-term sustainability and preservation of Pushkarnis.

Methodology:

1. The project follows a structured approach combining image processing and deep learning techniques. Initially, a dataset of Pushkarani images is collected from various sources, including field visits and online repositories. These images are preprocessed using techniques such as resizing, normalization, and enhancement to improve quality and consistency.
2. Next, multiple deep learning models such as MobileNet, ResNet50, DenseNet, EfficientNet, and Vision Transformers are implemented for classification and detection tasks. These models are trained to identify architectural features, detect cracks and structural damage, and assess water quality indicators like turbidity and algae presence.

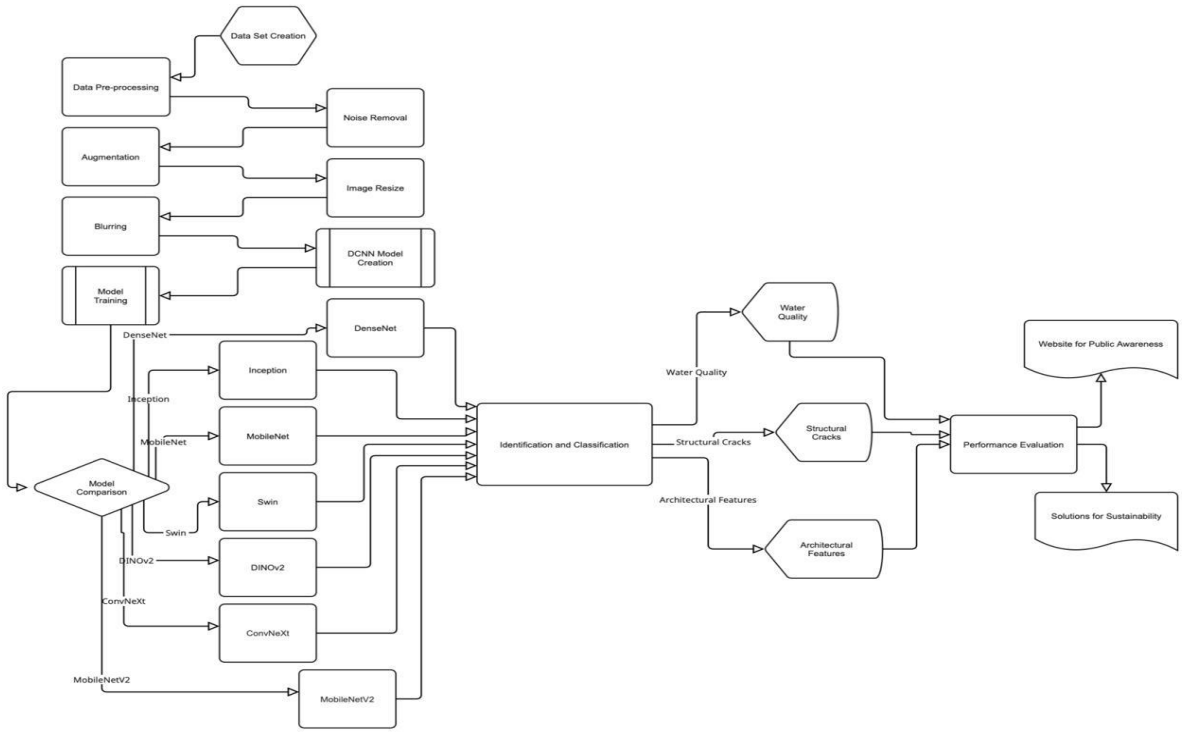

Figure 1:Proposed System Workflow

1. The system integrates these models into a web-based platform where users can upload images and receive real-time predictions. The workflow includes image input, preprocessing, model inference, and result visualization.
2. Additionally, performance evaluation is carried out using metrics such as accuracy, precision, recall, and confusion matrices to ensure reliability. The final system also includes features like visualization dashboards and recommendations for conservation actions.

Result and Conclusion:

1. The developed system successfully demonstrates the ability to analyze Pushkarnis using computer vision techniques. The deep learning models achieved high accuracy in detecting structural defects and classifying architectural features. Water quality indicators such as algae growth and contamination were also effectively identified.
2. The integration of multiple models improved overall prediction performance and reliability. The web-based interface provided an easy-to-use platform for real-time analysis and visualization.
3. In conclusion, the project presents a scalable and efficient solution for heritage conservation. It reduces dependency on manual inspection and enables proactive maintenance of Pushkarnis. The system highlights the potential of artificial intelligence in preserving cultural and environmental assets.

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Future Scope:

1. The future scope of this project includes expanding the dataset to cover more geographical regions and improving model accuracy using advanced architectures.
2. Integration with drone and satellite imagery with real-time IoT sensors for water quality can enable large-scale monitoring of Pushkarnis.