Proposal 4

Title:
Enhancing Conservation Efforts for Endangered Species through Explainable AI: Bridging Data Insights and Ecological Strategies

Context
The integration of artificial intelligence (AI) into conservation science has significantly advanced the analysis of species populations, habitats, and ecological patterns. Machine learning algorithms can process vast datasets to uncover insights into species decline, habitat requirements, and repopulation strategies that were previously difficult to identify. However, the complexity and opacity of these AI models often limit their acceptance and effective application by conservationists and ecologists. The lack of transparency in AI-driven insights can lead to skepticism and underutilization of valuable data.

This project aims to explore the concept of explainable AI (XAI) within the domain of conservation efforts for endangered species, focusing on how it can enhance the accuracy, reliability, and trustworthiness of AI-generated insights. By examining key techniques and methods for achieving explainability in AI models, the project seeks to empower conservationists and ecologists with intuitive tools for interpreting and applying data-driven insights to improve species repopulation strategies. Additionally, the research will identify challenges and opportunities associated with implementing explainable AI in conservation and propose recommendations for future advancements in this area.

Aim
The goal of this project is to design, develop, and evaluate a prototype of an explainable AI system tailored for conservation analytics. This thesis will also investigate how Human-Computer Interaction (HCI) principles can be leveraged to support end-users' understanding of the use and outcomes of explainable AI systems in conservation efforts to repopulate endangered species.

Reference:

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Karatopak, S. A., & Sen, D. (2023). *Exploring the Feasibility of Generating Realistic 3D Models of Endangered Species Using DreamGaussian: An Analysis of Elevation Angle's Impact on Model Generation*. arXiv. https://arxiv.org/abs/2312.09682

Estopinan, J., Bonnet, P., Servajean, M., Munoz, F., & Joly, A. (2024). *Modelling Species Distributions with Deep Learning to Predict Plant Extinction Risk and Assess Climate Change Impacts*. arXiv. https://arxiv.org/abs/2401.05470

Chalmers, C., Fergus, P., Wich, S., & Montanez, A. C. (2019). *Conservation AI: Live Stream Analysis for the Detection of Endangered Species Using Convolutional Neural Networks and Drone Technology*. arXiv. https://arxiv.org/abs/1910.07360

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