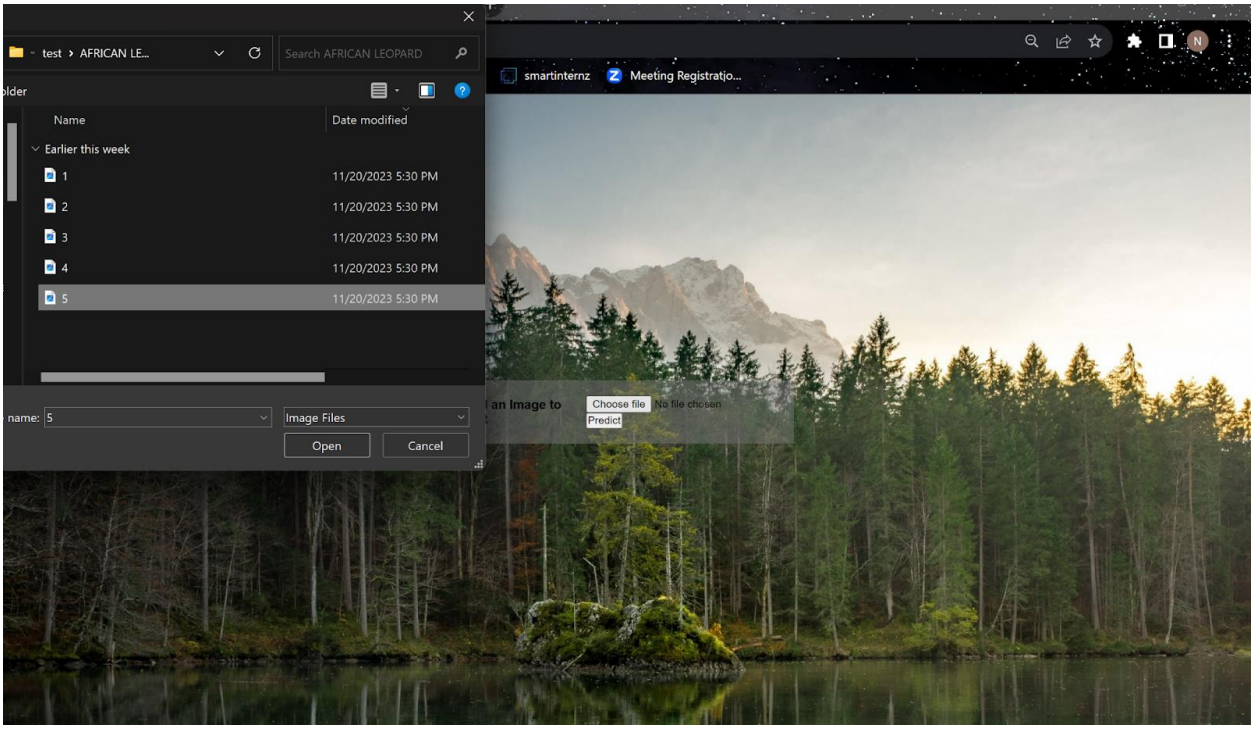
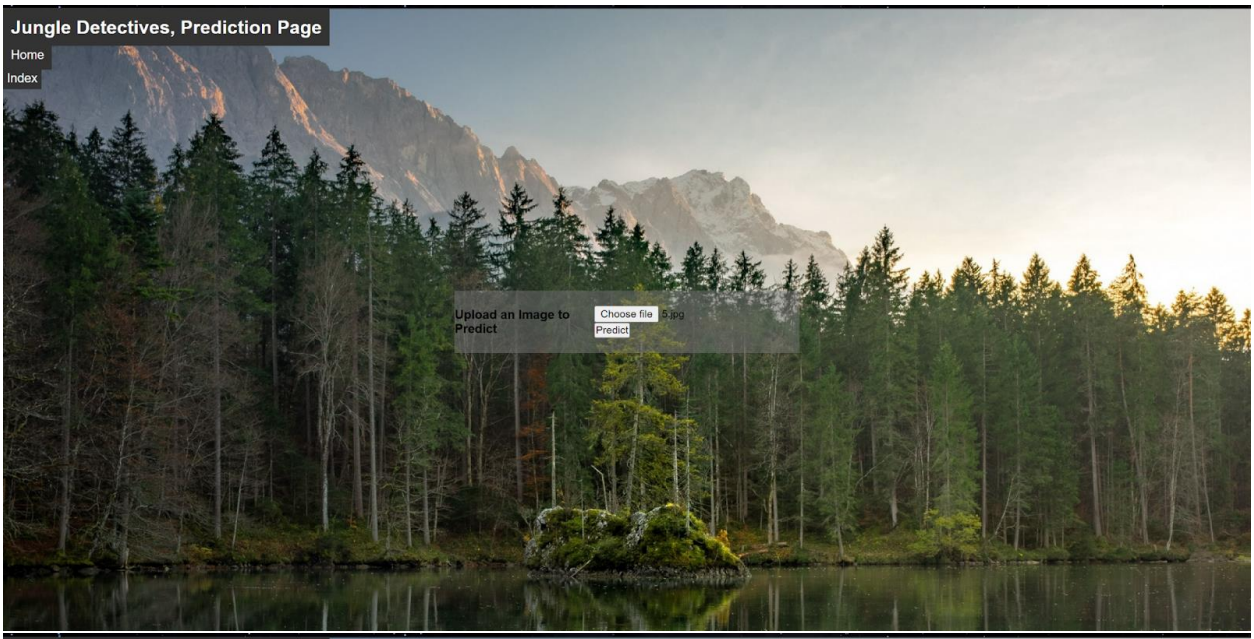
RESULTS

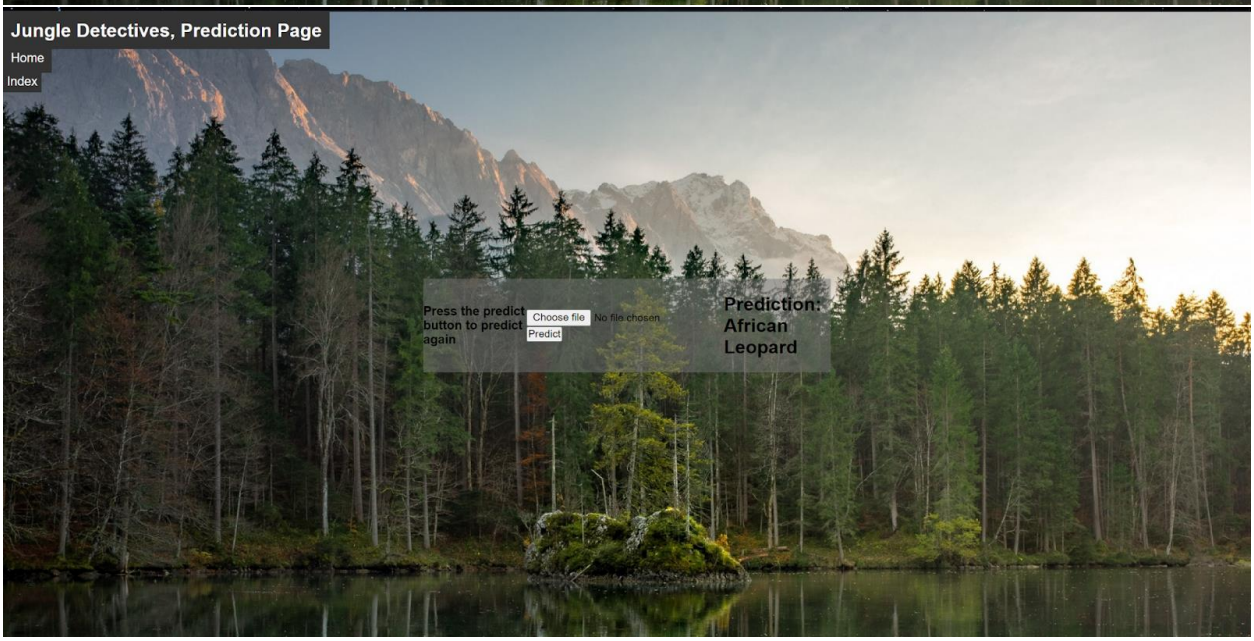
Output Screenshots

```
####################
#testing for ocelot#
####################
from tensorflow.keras.utils import load_img
from tensorflow.keras.utils import img_to_array
img = load_img(r"C:\Users\nihar\Downloads\new animals\test\OCELOT\4.jpg")
img = img.resize((351,351))
x = img_to_array(img)
x = np.expand_dims(x,axis=0)
a = np.argmax(resnet_model.predict(x),axis=1)
class_names = ['African Leopard' , 'Caracal' , 'Cheetah' , 'Clouded leopard' , 'Jaguar' , 'Lions' , 'Ocelot' , 'Puma' , 'Snow Leo
y_pred=resnet_model.predict(x)
class_idx = np.argmax(y_pred,axis=1)[0]
class_name=class_names[class_idx]
print( 'Predicted Class name:' ,class_name)
```

```
1/1 [==============================] - 1s 1s/step
1/1 [==============================] - 0s 194ms/step
Predicted Class name: Ocelot
```







ADVANTAGES & DISADVANTAGES

Advantages: The project aims to contribute to wildlife conservation by providing a tool for identifying and monitoring big cat species. It serves as an educational tool for wildlife enthusiasts, students, and educators. The machine learning model automates the process, saving time and resources compared to manual methods. The model's feedback loop and interpretability tools enhance user engagement, promoting better understanding of predictions. The project's focus on continuous learning ensures the model adapts to changes in the dataset and user feedback. The model's public accessibility through a web application fosters widespread interest in wildlife identification. The project also addresses ethical considerations, including bias

mitigation and privacy assurances, demonstrating a commitment to responsible AI practices.

Disadvantages: The project faces several challenges, including limited datasets, complex interpretability of deep neural networks, ambiguity in image identification, user feedback variability, deployment and scalability challenges, model maintenance overhead, potential misuse, dependency on user feedback, and model training resource requirements. Limited datasets may hinder the model's generalizability to all big cat species and scenarios. Interpretability may be challenging due to the complexity of deep neural networks and the need for complex visualization tools. Image identification may be ambiguous, leading to misclassifications. User feedback may vary in quality and relevance, making managing and categorizing diverse feedback a complex task. Deploying and maintaining a machine learning model in a web application may pose challenges related to scalability, performance, and user experience. Regular model updates and maintenance require ongoing effort and resources, including monitoring for biases and ethical considerations. The model's effectiveness depends on user participation, and low user engagement may limit its benefits.

CONCLUSION

The Big Cat Species Classification project is a significant advancement in machine learning for wildlife conservation and education. It uses advanced technologies to automate the identification of various big cat species, contributing to the understanding and preservation of wildlife. The project's benefits include potential impact on conservation efforts and an engaging educational resource. Its commitment to continuous improvement and ethical considerations, such as bias mitigation and privacy assurances, reflects a responsible approach to AI deployment in sensitive domains like wildlife conservation. However, the project faces challenges such as dataset limitations, interpretability of complex models, and potential ambiguity in image identification. User engagement, deployment scalability, and ongoing model maintenance are also important considerations. Despite these challenges, the project holds great promise, aligning technological innovation with environmental stewardship. Its user-friendly interface, interpretability tools, and ethical AI practices demonstrate the potential of machine learning in fostering a deeper connection between technology and the natural world.

FUTURE SCOPE

The Big Cat Species Classification project is a comprehensive tool for wildlife conservation, research, and public engagement. Its future scope includes enhanced model accuracy, multi-species recognition, real-time monitoring, mobile application integration, multimodal learning, cross-species identification, global collaboration, education and outreach programs, adaptability to climate and environmental changes, integration with conservation databases, blockchain for conservation records, and quantifying population dynamics.

The project aims to refine its model by incorporating state-of-the-art architectures, exploring diverse datasets, and experimenting with advanced training techniques. It also plans to expand its capabilities to recognize and classify multiple species within the same image, facilitating a more comprehensive understanding of the wildlife ecosystem. Real-time monitoring capabilities could be developed to analyze live video streams, enabling the model to identify and track big cat species in their natural habitats.

A mobile application could be developed to encourage broader participation in citizen science initiatives and wildlife monitoring. Multi-modal learning could involve incorporating audio and behavioral data to enhance the model's understanding of big cat species. Cross-species identification could be expanded to include other wildlife species beyond big cats.

By exploring these future scopes, the Big Cat Species Classification project can become a dynamic and comprehensive tool for wildlife conservation, research, and public engagement.