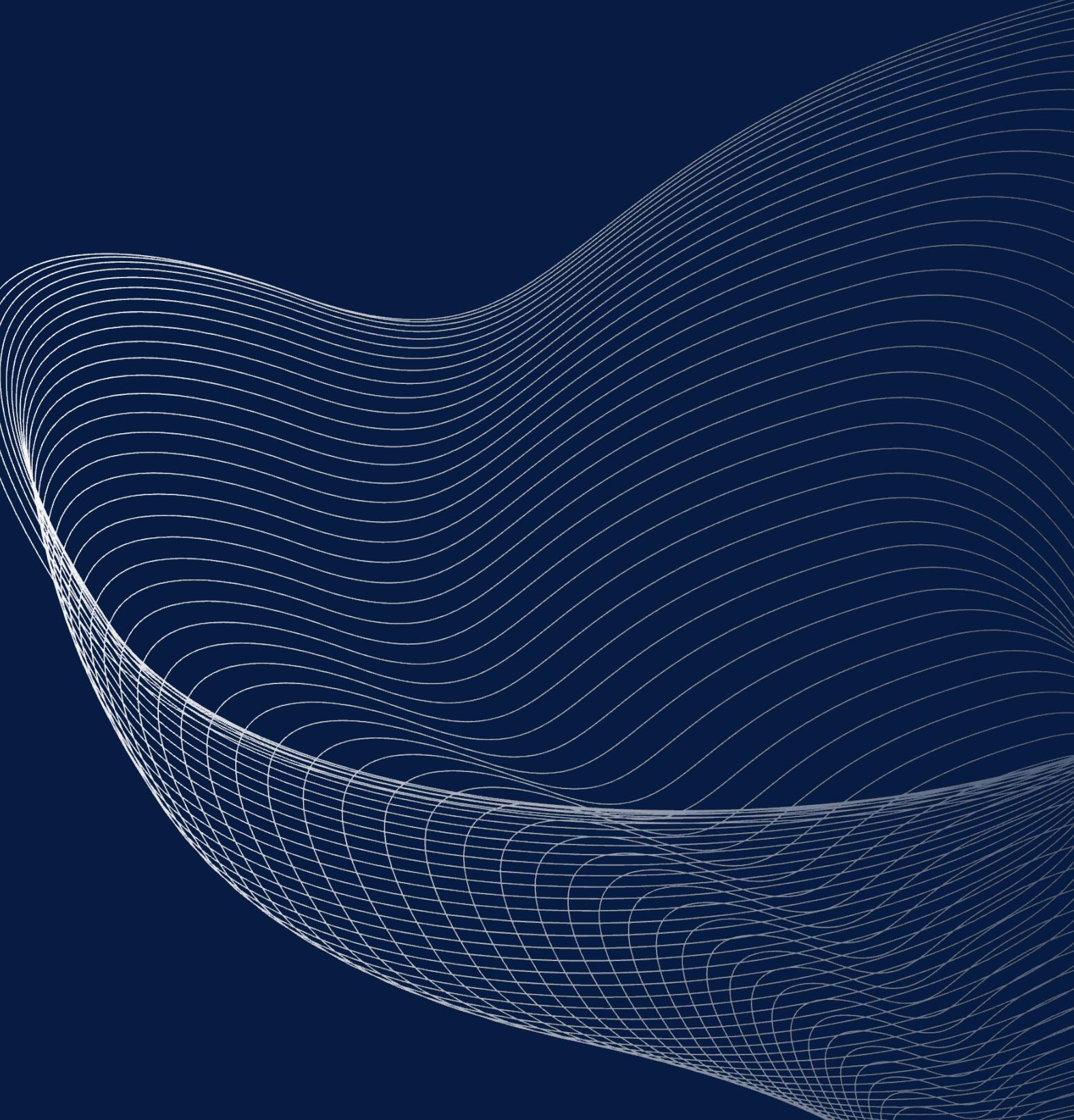


# HackTrix'24

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# Introduction

## ZOONET

### Project Overview :

The Title of our Project is [Animal Classification and Detection of Species].

- ❖ ZooNet is a revolutionary web-based platform that is set to redefine how individuals and communities monitor and classify wildlife species. In today's world, conservation and biodiversity monitoring are critical, and ZooNet takes center stage by leveraging advanced technology to track and classify animals effortlessly.
- ❖ Using the advancements in Computer Vision and Deep Learning Algorithms, ZooNet can identify and classify a wide range of animal species from visual sources such as images..
- ❖ Whether you're a wildlife enthusiast, researcher, or conservationist, ZooNet provides a powerful tool to monitor and protect wildlife populations.

# Target Users and market selection

The Target Users and Market Selection for are project are based ln specific applications and goals

## 1. Wildlife Conservation Organisation:

Target Users:[Wildlife Researchers, Field Biologists]

Market Selection:[Develop solution for providing aid for endangered species.]

## 2. Zoo and Aquariums:

Target Users:[Zoologists, Zookeepers and educational staff]

Marker Selection:[Aiding in animal management and identification]

## 3. Environment Agencies:

Target Users:[Environment scientists, Ecologists]

Market Selection:[Provide solution for monitoring biodiversity]

## 4. Farmers and Agricultural Industry:

Target Users:[Wildlife photographers, ecotourism guides, and nature enthusiasts]

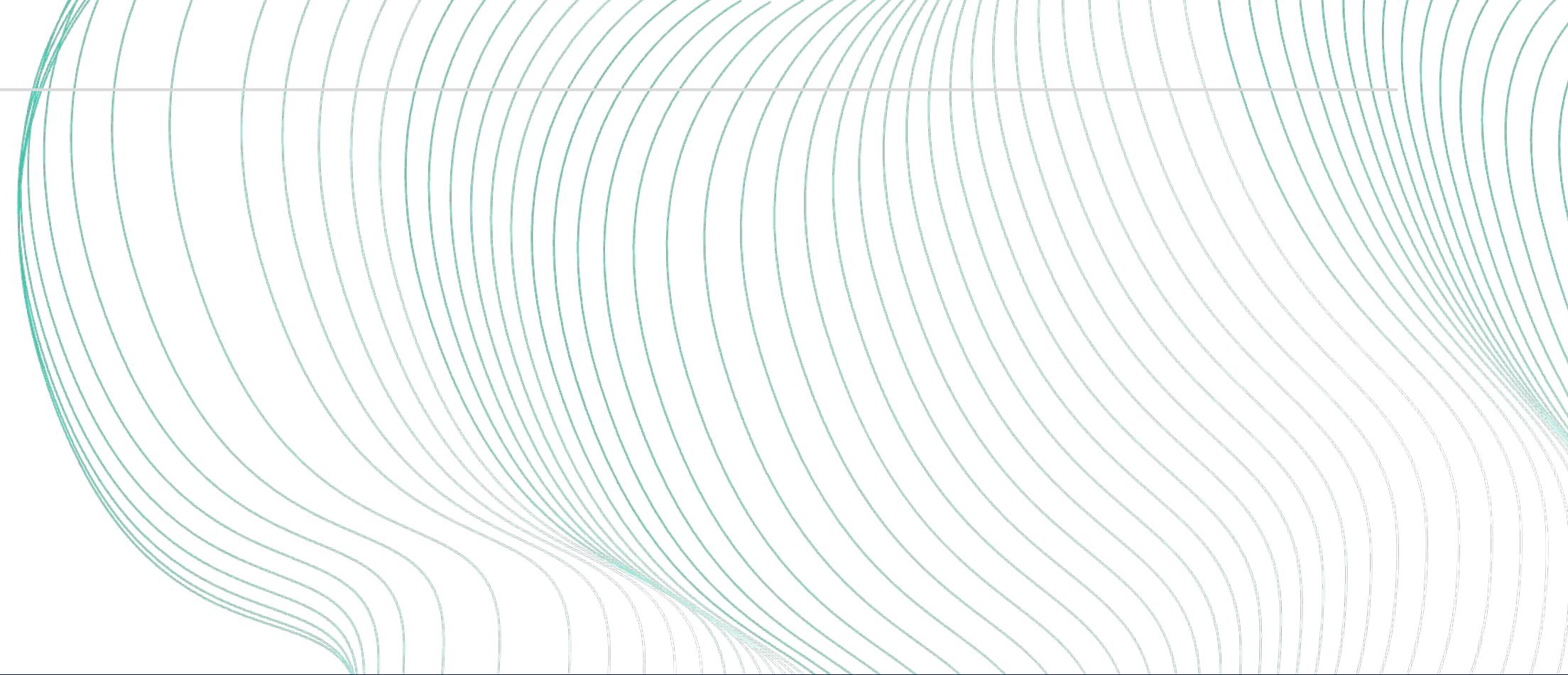
Market Selection:[Create tools for identifying and managing wildlife that may impact agriculture]

## 5. Pet Industry:

Target Users:[Pet owners, veterinarians, and animal welfare organizations]

Market Selection:[Develop applications for identifying and classifying pet species, promoting responsible pet ownership]

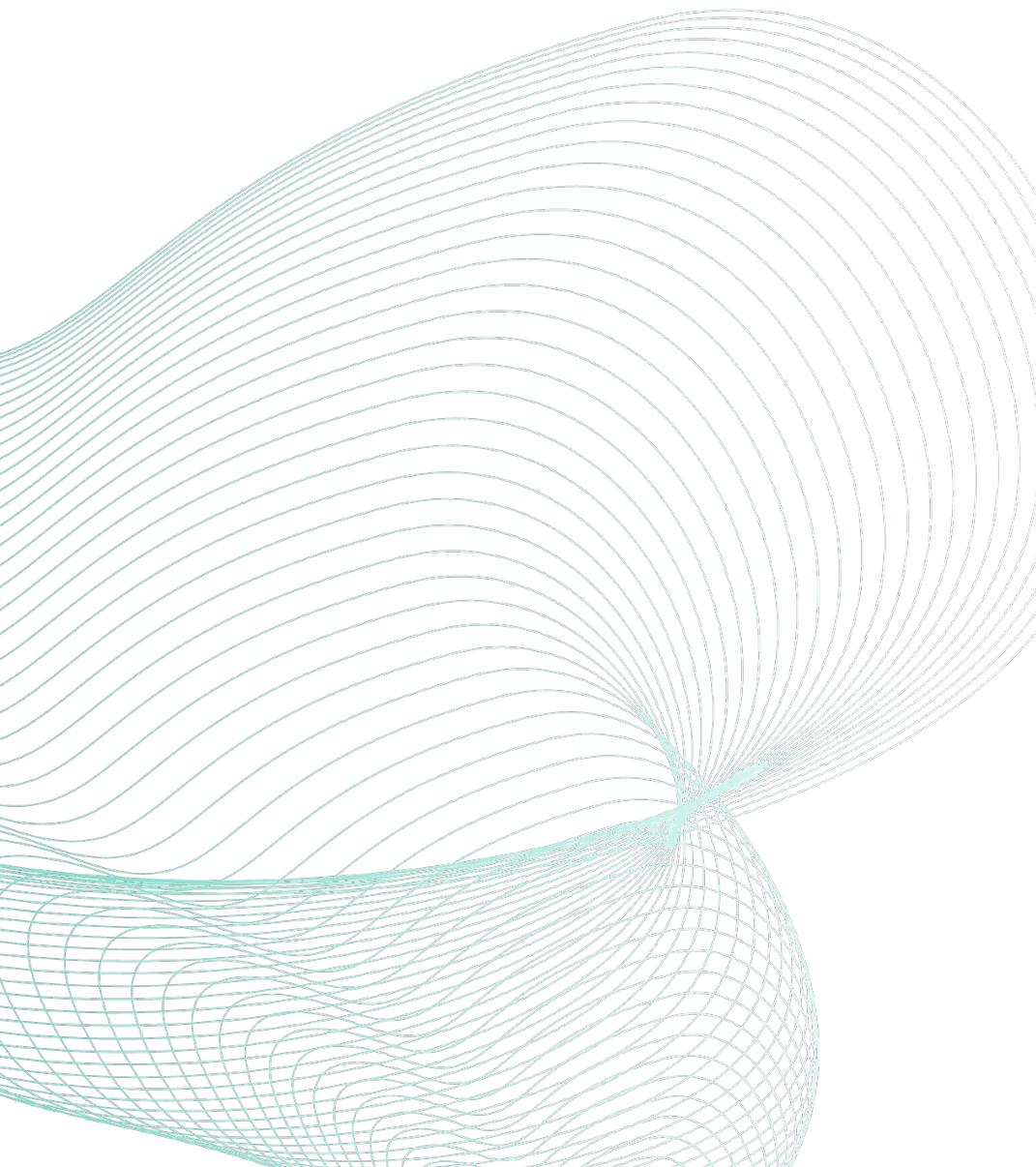
# Problems



## Explain

This challenge aims to create a deep learning model that can accurately classify and recognize animal species in photos and videos. The goal is to develop a system capable of identifying a diverse range of species, from common to endangered, in a variety of locations and settings, including wildlife reserves, forests, oceans, and cities.

# **Proposed solution (Solution, Key features, Technical Architect)**



Our goal is to develop a robust model that can accurately identify and categorize animal species from sources such as images.

In this project we tend to use CNN for our model for the detection of a variety of animal species which are captured with the help of the mobile application.

We are making predictions in real-time, as the animal comes in front of the camera, each frame would be sent to the system where our model will produce the output within a few micro-seconds.

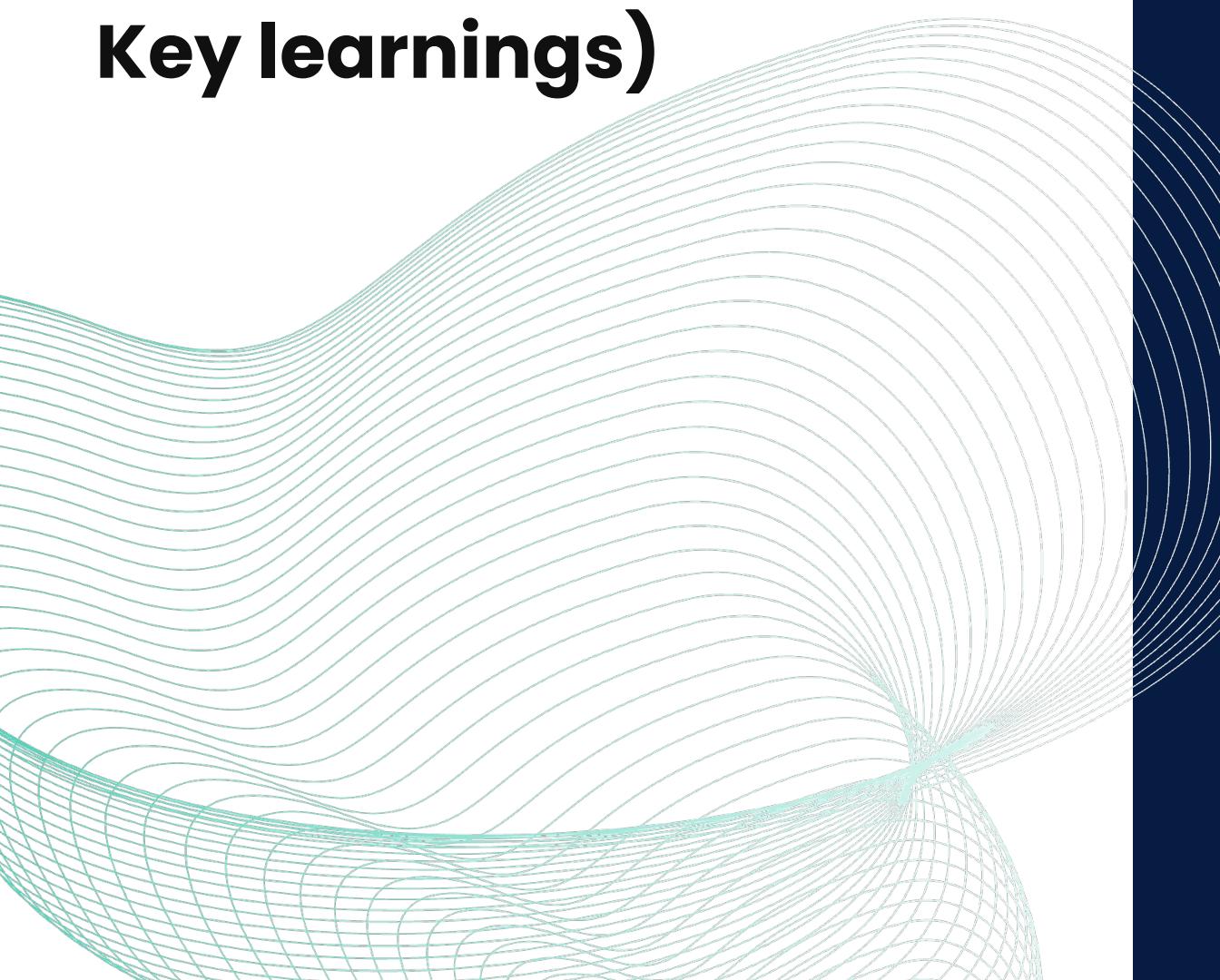
Project Consists of the following subtask:

1. Data Exploration and Collection
2. Dataset Creation
3. Data Preprocessing
4. Image Preprocessing
5. Model Creation
6. Model Training with Optimization and Enhancement
7. Using a Trained model with Computer Vision Techniques

- ❖ We collected various datasets of images of various animal species which was present on Kaggle, from their by the help of kaggle api key imported these datasets to our Google Colab notebook and did some processing and merged them to make a single dataset then divided whole dataset into train and test dataset.
- ❖ By the help of Keras framework we did image preprocessing on batches of dataset.
- ❖ Then these batches of dataset was applied to our CNN model and based on that network, we made our model learn the features of images and later on classify animal images into classes.

# Challenges and Key Learning

**(Technical challenges,  
Solutions & workaround,  
Key learnings)**

A large, abstract graphic on the left side of the slide features a series of thin, light blue lines that form a complex, undulating pattern resembling waves or a neural network. The lines are more concentrated at the bottom left and spread out towards the top right.

## TECHNICAL CHALLENGES:

- ❖ Variability in Images: Images of animals can vary significantly in terms of lighting, pose, background, and occlusions, making it challenging to develop a model that can accurately classify all variations.
- ❖ Limited Data: Annotated data for training animal classification models can be limited, especially for rare or less-studied species, leading to difficulties in building robust models.
- ❖ Real-Time Processing: For applications requiring real-time animal detection and classification, there are challenges in achieving low latency and high throughput.
- ❖ Model Interpretability: Deep learning models used for animal classification are often considered black boxes, making it challenging to interpret their decisions and understand the features they use for classification.

# Future work

## (Potential features, plans for scaling)

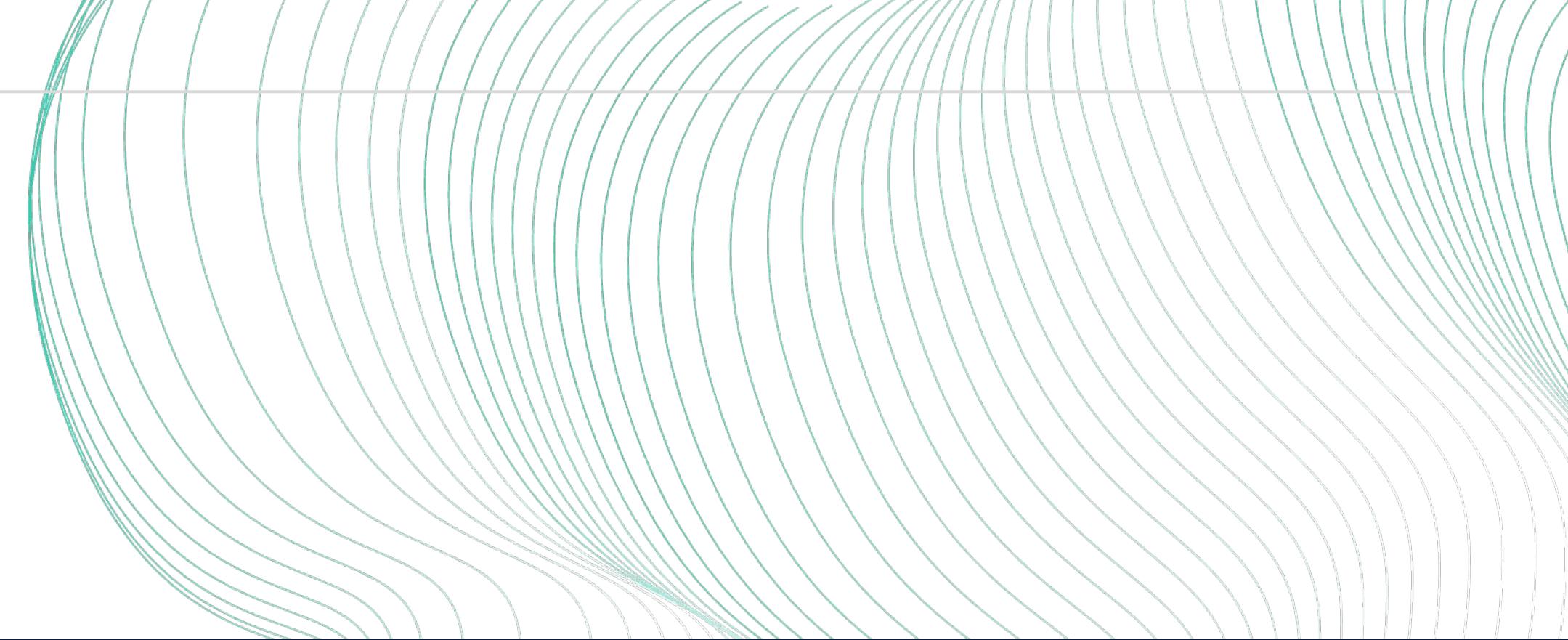
For future work or potential improvements in an animal classification and species detection project, we consider the following areas::

### Explain

- ❖ Fine-grained Classification: Improve the model's ability to distinguish between closely related species or individuals within a species, which can be challenging due to subtle differences in appearance.
- ❖ Behavior Recognition: Extend the model to not only classify species but also recognize behaviors, such as feeding, mating, or aggression, which can provide valuable insights for research and conservation.
- ❖ Real-time Monitoring: Develop methods for real-time or near-real-time species detection, which can be useful for wildlife monitoring and conservation efforts

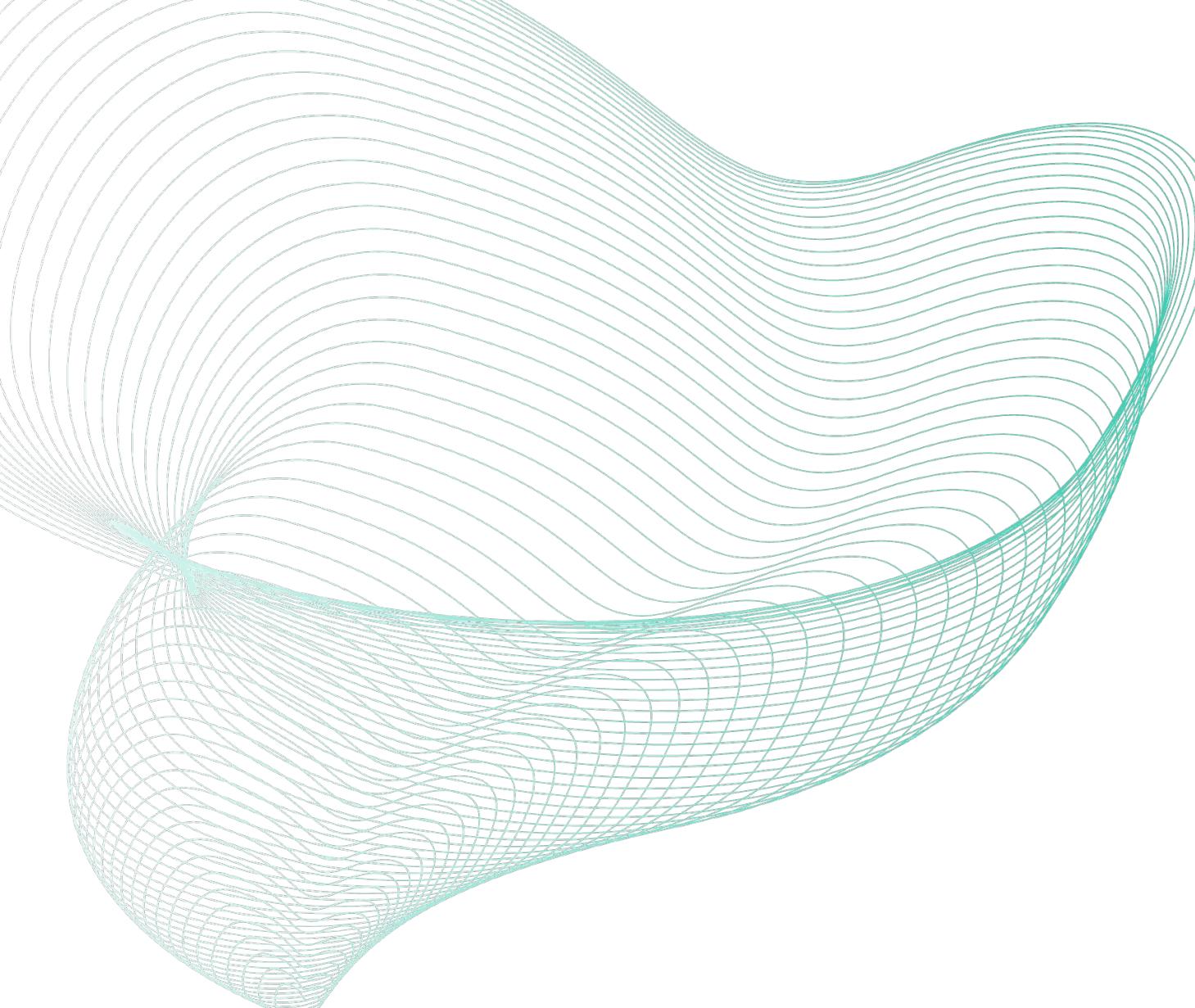
# Business Model and Monetization

(Business model canvas, Monetization, Estimated costs)



## Explain

- ❖ Subscription Service: Offer a subscription-based service for access to the animal classification and species detection platform, with different tiers based on usage limits or features.
- ❖ Pay-per-Use: Charge users based on the number of images processed or the level of analysis performed, allowing for flexible pricing based on usage.
- ❖ Advertising and Sponsorship: Explore advertising opportunities or sponsorships with brands or organizations interested in supporting wildlife conservation and environmental causes.
- ❖ Grants and Funding: Seek grants and funding from government agencies, foundations, or non-profit organizations that support wildlife conservation and technology innovation.



# **Conclusion**

## **(Recap & acknowledgments)**

- ❖ In conclusion, the animal classification and species detection project presents a unique opportunity to leverage advanced technology for wildlife conservation and research. By accurately identifying and monitoring animal species, the platform can aid in conservation efforts, support research studies, and raise awareness about biodiversity and environmental issues.
- ❖ The project's business model and monetization strategy, including subscription services, data licensing, consulting services, advertising, and value-added services, offer a sustainable way to generate revenue while providing valuable tools and services to users and organizations.
- ❖ In summary, the animal classification and species detection project not only has the potential to make a positive impact on wildlife and the environment but also offers a viable business opportunity that aligns with the goals of sustainability and conservation.

# Prototype working

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Comment Share A

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Files

Code Text

from keras.preprocessing import image  
test\_image = image.load\_img("/content/Test Image.jpg",target\_size=(256,256),color\_mode='grayscale')  
test\_image



Disk 70.97 GB available [29] test\_image = image.img\_to\_array(test\_image)

TEST IMAGE

File Edit View Insert Runtime Tools Help All changes saved

Comment Share A

RAM Disk Colab AI

Files

Code Text

[36] test\_image = image.img\_to\_array(test\_image)  
test\_image = np.expand\_dims(test\_image,axis=0)

[37] result = model.predict(test\_image)

my\_dict=training\_set.class\_indices  
def get\_key(val):  
 for key, value in my\_dict.items():  
 if val == value:  
 return key  
  
 return "key doesn't exist"

pred=list(result[0])  
for i in range(len(pred)):  
 if pred[i]!=0:  
 print(get\_key(i))

1/1 [=====] - 0s 86ms/step  
zebra

RESULT