# Introduction

AI-powered wildlife discovery platform for smart eco-tourism. My name is Man Ho Cheung. I created this application by integrating my specialty in machine learning with the APIs and interface created by Amazon Q Developer.

# Pitch

## Quick Overview

Our busy city is actually home to over a thousand land and marine species. However, the number has degraded to below 900 over time. The reasons for this can be urban expansion and regional development. To contribute to protecting this precious ecosystem, I built an interactive AI-powered web platform with a unique prediction feature to bring awareness to the locals and tourists and a valuable tool for the local green groups.

# Background

## How

My application not only shows the historical occurrences of species; its unique future occurrence predictions attract families to spend time outdoors to learn and sight their favourite species. It also provides local green groups with data-driven insights for extinction identifications, protected areas planning, environmental impact assessments, etc.

# Technical AspectsPp

The development is mainly divided into two parts: the AI model and the application architecture.

## AI Model

I developed a grid-based neural network model using 24 years of species occurrence geospatial data from Esri with PyTorch. The coordinates were transformed into grids for efficient model training to showcase the concept at this preliminary stage.

## Application Architecture

After receiving my idea and basic structure, Amazon Q Developer wrapped my data and neural network model with an enhanced data processing pipeline, added production features, and created a web interface locally using FastAPI and remotely with Amazon Lightsail implementation.

# Demo

The application was successfully deployed and tested locally and remotely. Given this project's large amount of required data, I use an Amazon Lightsail instance with enhanced RAM and CPU. The application can be accessed directly through the public IP address.

In this stage, the application showcases the basic features, including a drop-down list of all available species, a show-all button that allows users to browse the species with photos, historical occurrences by districts on an interactive map, and another interactive map showing the predicted occurrences.

# Future Potential

This baseline application is API-ready for integration with other systems. As I refine the predictive model, while Amazon Q Developer further polishes the web interface, the application will be more robust.

More polished features include:

* Animated visualisation showing the species movement over the years
* More fine-grained predicted locations instead of grids
* Additional automatically curated details
* Photo recognition as an option for searching for species

# Conclusion

Ultimately, this project aims to make Hong Kong’s biodiversity data accessible, fun, and actionable through AI.