

Venomous Snake Classification

Cole Anderson

DS4002: Case Study

https://github.com/ColeAnderson2002/CS3_DS4002



You're trekking far from civilization, through forests and deserts. The air around you comes alive... but also puts you at peril. You're an adventurer, a biologist, or a survivalist, and your life might be hanging on a single skill: being able to determine whether a snake ahead of you is poisonous or not.

Sadly, merely instinct and experience aren't sufficient. Some snakes that seem unthreatening are deadly, and others looking menacing are harmless. You have a need: quick, accurate, and more intelligent than human intuition... to categorize the snakes you find.

That's where your project enters the picture.

For this case study, your task is to design a convolutional neural network model that, when presented with a snake image, can identify whether it's venomous or not venomous. You'll have a real-world dataset of thousands of images of snakes, meticulously split into training data and test data. You want to craft a model that not only performs well on examples to which you've already been exposed but also generalizes well to unseen snakes encountered in nature.

What you'll be working on:

- Labeled images with thousands of snake images distributed across train and test folders.
- Two categories: venomous and non_venomous
- Pre-trained deep neural architectures such as MobileNetV2 to enhance speed and accuracy.

Your responsibilities:

- Preprocess and clean the image data.
- Construct and train a CNN to differentiate between the two classes.
- Reach a minimum 90% accuracy on the validation set (but pray for more!).
- Evaluate your model on its precision, recall, F1-score, with confusion matrices.
- Document your model's strengths, weaknesses, and recommendations for real-world improvements.

Are you prepared to design the model that saves adventurers from death? Click below to get started:

https://github.com/ColeAnderson2002/CS3_DS4002