Machine Learning Techniques Can be used to **Identify** Crocodiles from **Drone** derived imagery for the purpose of **Conservation**

Assessing the Feasibility of Identifying Wildlife from A Drone's Perspective

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1 Intro

- Crocodile populations are under threat. Effective monitoring is essential for their conservation.
- Propose use of drone imagery & ML techniques to identify unique features of individual crocodiles for population monitoring.
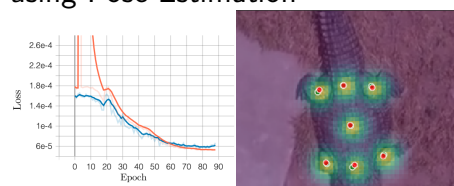
2 Methods

- The project employs CNN for identifying crocodiles within drone-derived imagery and applies "Instance level analysis" for individual recognition based on Pose Estimation methods.

3 Results

Phase-I: Crocodile Identification, obtained overall accuracy of 84%
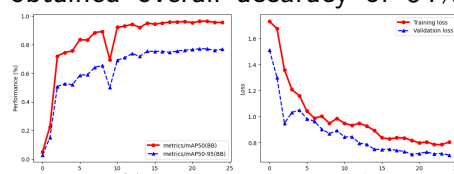
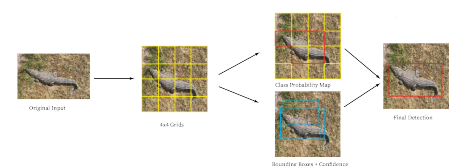Phase-II: Crocodile Re-Identification using Pose-Estimation

- The results from the tests are promising, however, further training is required to improve the model's performance.
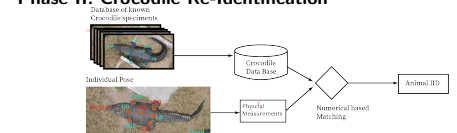
Extra figures

Phase 1: Crocodile Identification

Hyperparameter	YOLO-v8s
Optimiser:	Stochastic Gradient Descent
Learning Rate:	0.01
Mini Batch size:	16
Epoch:	25
Input Image size:	640 x 640
Loss function:	Binary Cross-Entropy with Logits Loss

	Test set 1	Test set 2	Test set 3
TPR	89%	43%	33%
TNR	47%	60%	14%
FPR	53%	40%	86%

Phase II: Crocodile Re-Identification

- Re-identification framework, whereby new specimens are processed and compared to the specimen database.

System Architecture