

Using sequential satellite data to detect pest outbreaks

Beating the Beetle

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1 Aim

Twin strategies for early detection of *Gonipterus* Beetle infestation using a time-series of satellite data.

2 Methods

Point-wise (Pw) Approach

- Time-series per pixel with frequency bands as input feature
- GRU and LSTM model architectures

Block-wise (Bw) Approach

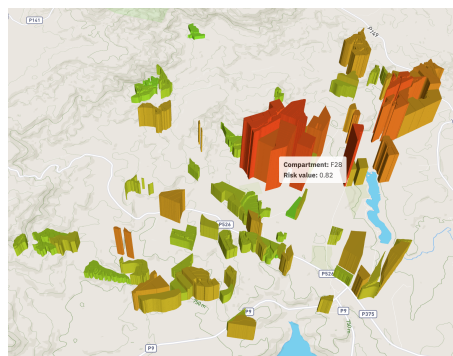
- Time-series per fixed size image block with frequency bands as input feature
- CNN with LSTM layer model architecture

3 Results

Model	Accuracy	Fit
Pw-GRU	93%	0.678 R^2
Pw-LSTM	93%	0.674 R^2
Bw-CNN	89%	0.83 F_1

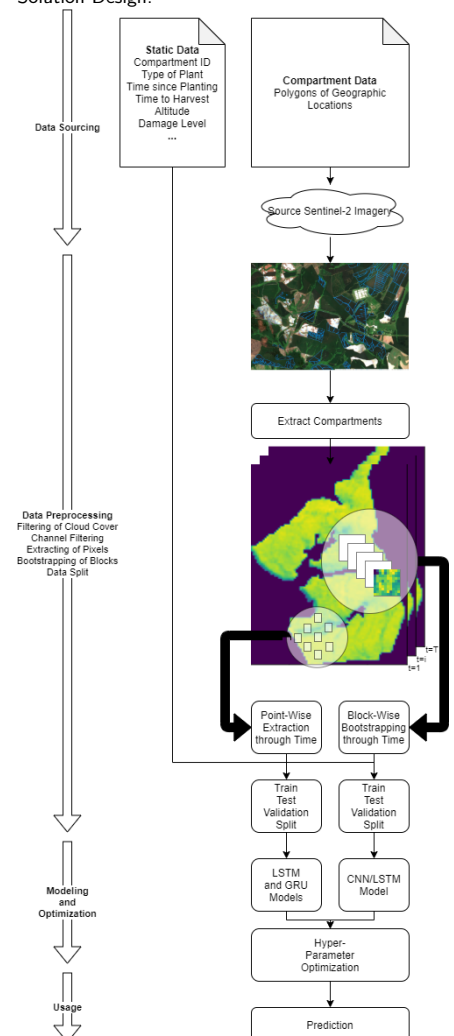
Integrated Interactive Solution

- Static and raw satellite data
- Geo-spatial visualisation of model predictions
- Field work planning
- Risk mitigation and damage control



Extra figures

Solution Design:



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Inligtingtegnologie / Lefapha la Boetsenere,
Tikologo ya Kago le Theknolotshi ya Tshedimošo

Capstone Project - MIT 808

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