Predictive policing in an endangered species context: Combating rhino poaching in the Kruger National Park

Emerging Researcher Symposium

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A new approach

* Images courtesy of web.up.ac.za and Google Earth.

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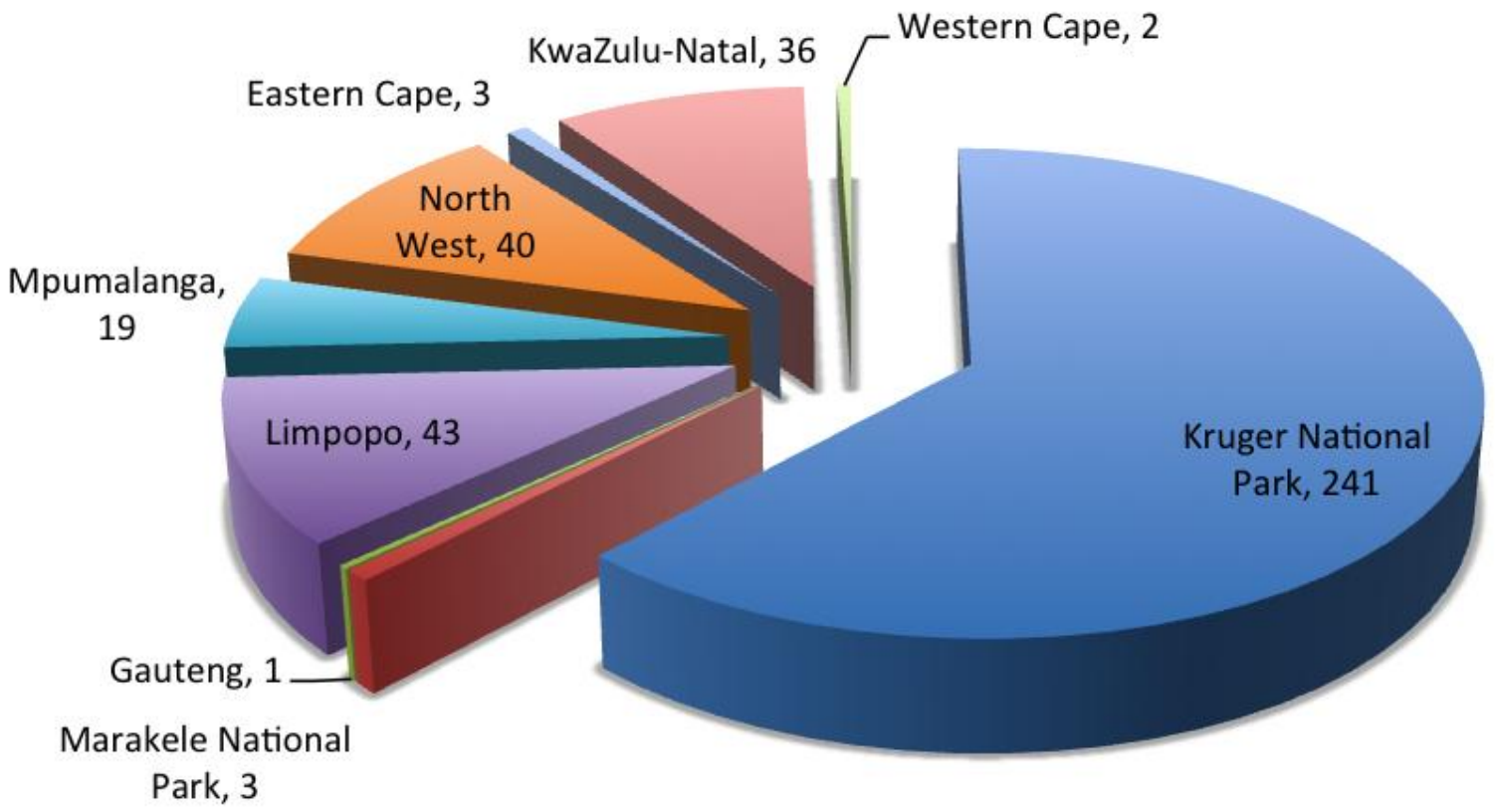
The magnitude of the problem

Rhino Poaching Statistics 01 January 2012 – 21 September 2012



Total: 388

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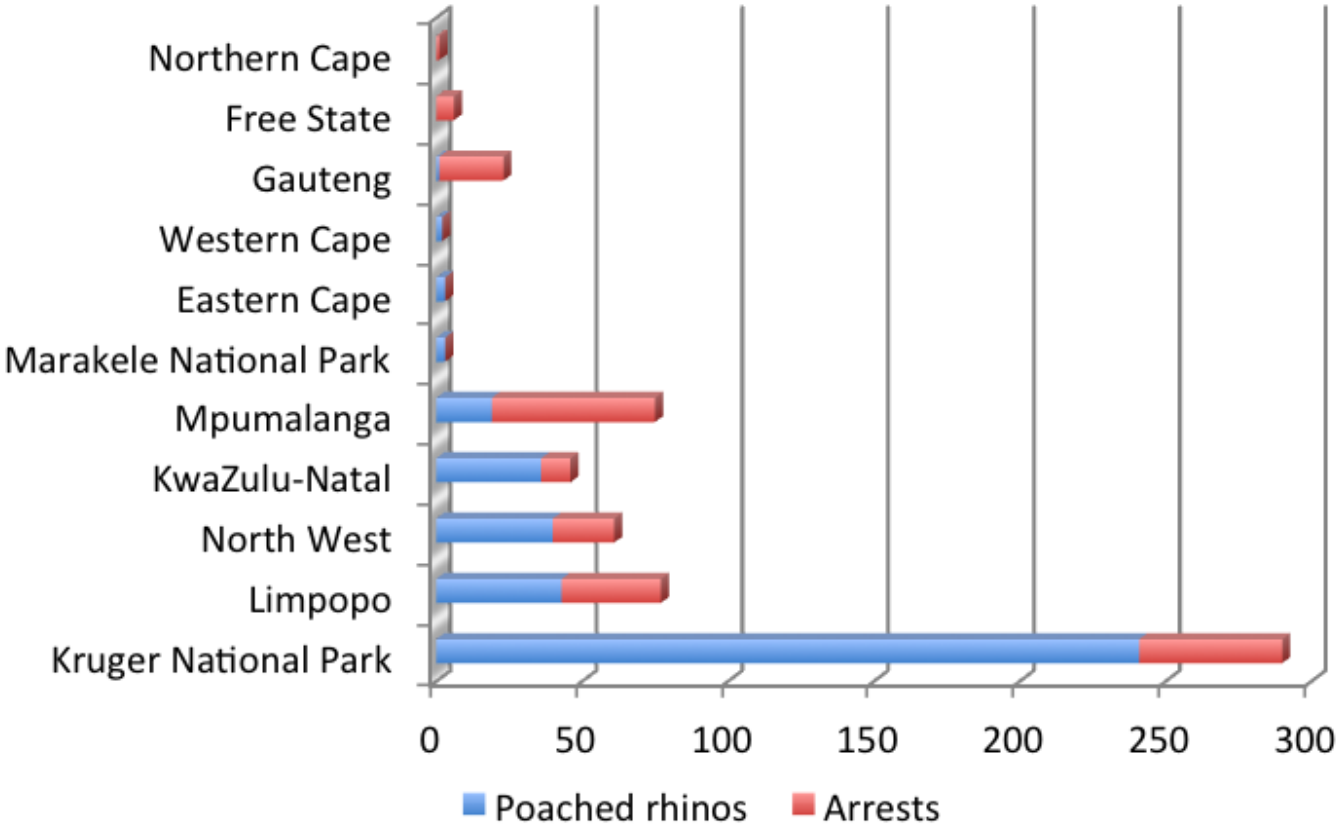
The current solution is not effective

Poaching attacks and arrests 01 January 2012 – 21 September 2012



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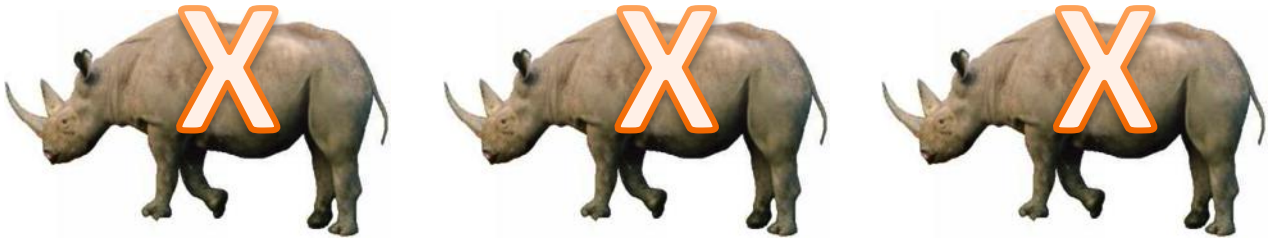
In summary – this is what is happening



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Reasons for this situation

* Image courtesy of http://www.rhinoconservation.org.

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Reasons for this situation

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The issue

- Patrol large portions of land
- Seldom in the right place at the right time
    - SOLUTION
- Employ more rangers, costly
- **Reduce the space in which the rangers need to patrol**

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Summary of problem

- Rhino population is decreasing rapidly
- There are not enough poachers caught to deter the syndicates
- Rangers cannot patrol the whole Kruger National Park effectively
- The employment of extra rangers is very costly

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Hypothesis

"Providing a top-level prediction tool to rangers can reduce rhino poaching in the Kruger National Park by predicting where a next rhino poaching is likely to occur."

* Image courtesy of http://www.findtripinfo.com/

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Approach

- Reduce the area rangers have to search in by constructing a “heat map” of the terrain
- A heat map is a graphical representation of data where certain values correspond to certain colours
- Obtained by fusing different sources of information
- Makes use of static and dynamic, historic and new data

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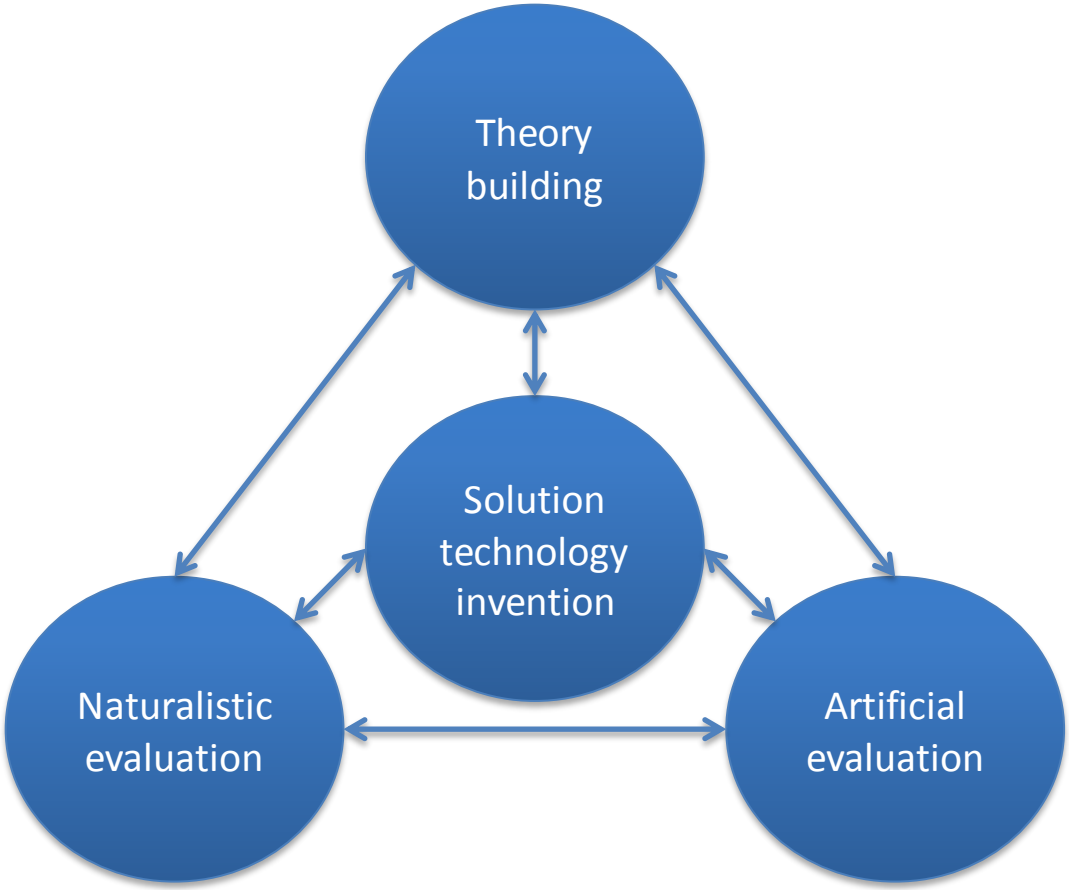
Research approach



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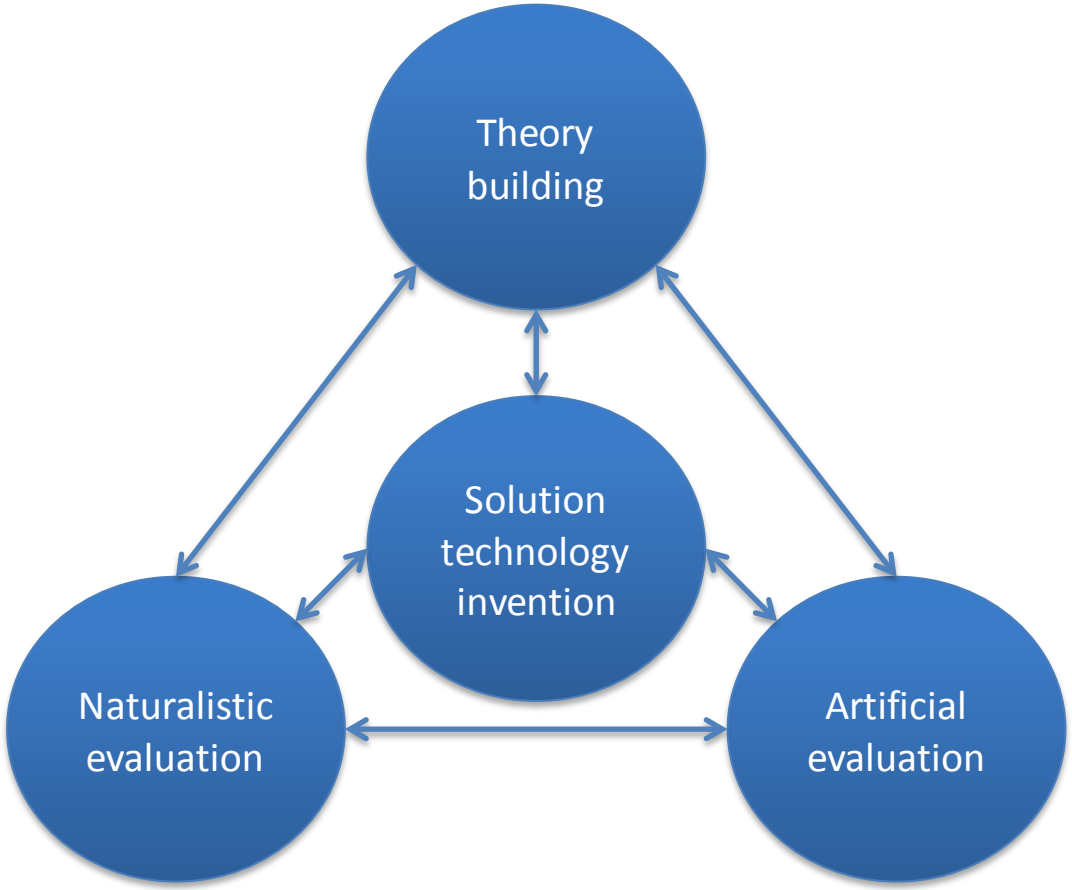
Research approach



- Problem identification and motivation
- Objectives of a solution
- Design and development
- Demonstration
- Evaluation
- Communication

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Research plan

Data + 

= Predictive policing tool

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Terrain map

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Poaching locations

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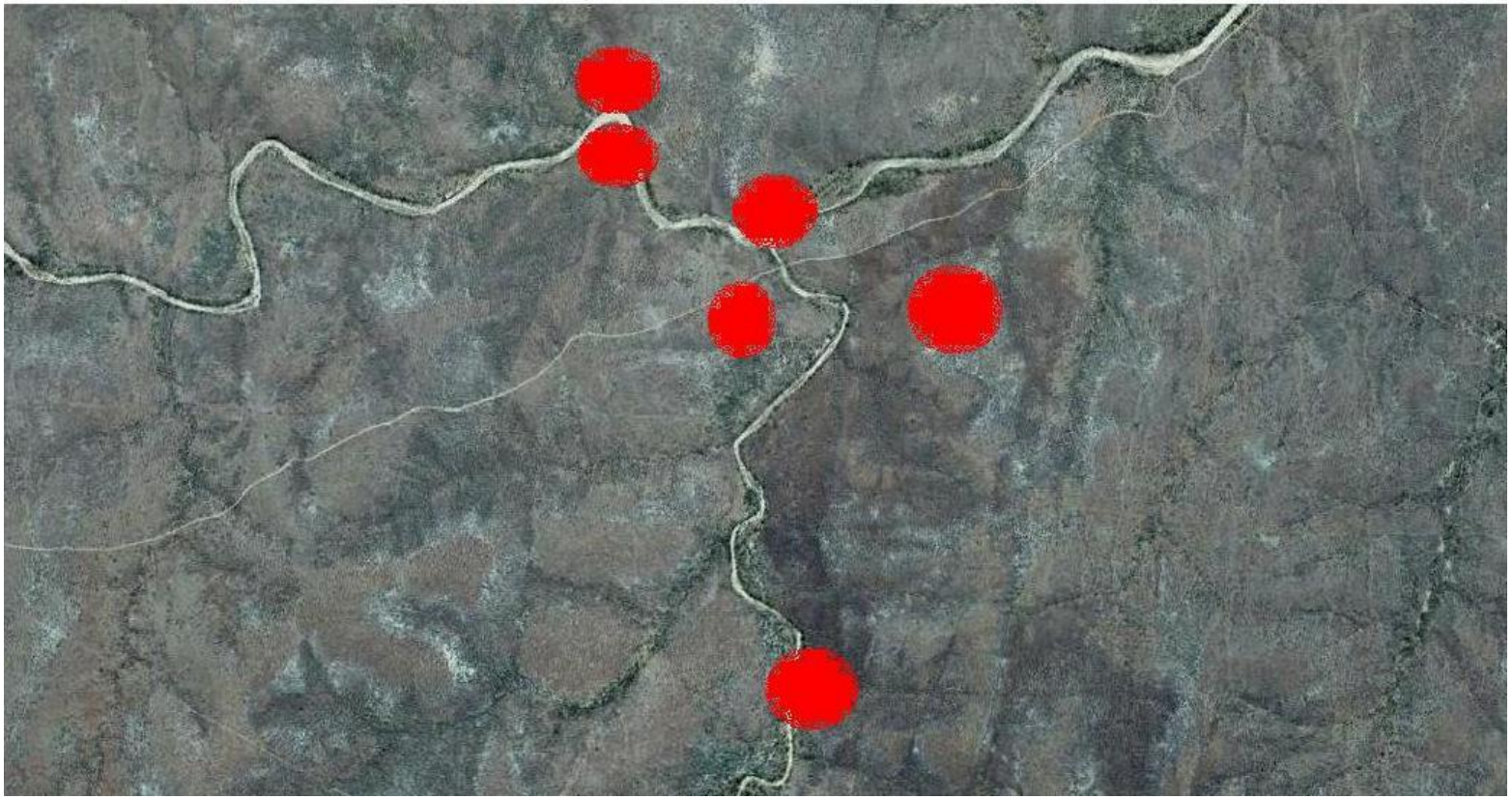
Predicted ‘hot spots’



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Next steps

- Build a heat map model
- Build a simulation that generates poaching spots
- Do simulation runs to tune heat map model
- Evaluate heat map model by testing it on real world data (obtained from Kruger National Park)
- Go back and refine model

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Acknowledgements

- Poaching statistics courtesy of http://www.environment.gov.za/
- Livari, Juhani and Venable, John. Action research and design science research -- seemingly similar but decisively dissimilar. In *17th European Conference on Information Systems* (ECIS), June 2009
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Your comments

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