

THEART OF RESEARCH

Where there's smoke, there's science

Evolution-inspired mathematical optimisation approaches are helping firefighters to respond to wildfires more rapidly.



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High-tech solutions are rapidly helping to determine where to deploy firefighters in response to wildfires. Dr Andries Heyns is in the foreground. Photo: Sullivan Photography

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Rural populations, wildlife and forestry plantations that are in dry, hot regions are regularly threatened by rampant and destructive wildfires.

It is crucial to have effective and constant surveillance of endangered landscapes to detect fires immediately after they start, and for firefighting forces to respond as quickly as possible. However, mountains and hills often obscure foresters' and rangers' direct view of flames and rising smoke. While hidden from view, wildfires have the freedom to rage uncontrollably

before being detected.

Researchers from the University of Alabama and the University of Pretoria have joined forces with South African-based ForestWatch to improve the effectiveness of state-of-the-art camera-based wildfire detection systems spread across four continents. Cutting-edge geographical analysis techniques and evolution-inspired system layout optimisation algorithms are being used to pinpoint the best site locations for ultra-modern tower-mounted cameras. Rising high above the terrain like

guardian angels, the bird's-eye view of these cameras over vulnerable areas is now better than ever before.

When combined with ForestWatch's revolutionary smoke-detection algorithms - based on South African-Antarctic research into the automated detection of aurora - the improved capability of detecting fires rapidly allows alarms to be sent out swiftly to firefighting forces. The end result is more immediate suppressing action and the minimisation of the scale of destruction.

