Australian National University

TECHNICAL SUMMARY

Learning to Detect smoke from bushfires with uncertainty using a transmission-based pairwise term

Image: Vladyslav Dukhin, https://www.pexels.com/photo/forest-fire-4070727/

The 2019-20 Australian Bushfires have had an estimated cost of $103B, the 2020 California wildfires an impact of $12B and the 2019 Amazon wildfires are estimated to cost Brazil $957B to $3.5T over a 30 year period. By the time the fires are detected by satellites, they are too big to contain. Detection from fire-towers is manual and leads to operational hazards for the staff.

Researchers at ANU have developed a new bushfire detection algorithm that can be deployed on control centres of fire services. The algorithm allows for accurate detection of smoke arising from a fire <5m2 at a distance of up to 50 km, previously impossible due to lack of defined shape and variable transparency of smoke.

Potential benefits

> **Accuracy:** Accurate detection of smoke from bushfires/wildfires
> **Automation:** Automation of detection from fire tower images and/or vide
> **Detection:** Triangulation of fire location from images from multiple towers.
> **Improved Safety:** Reduction in occupational risk for fire tower and telecommunications tower staff.
> **Distinctive Analysis:** Clear distinction between smoke vs clouds/fog

Potential applications

> Bushfire detection
> Wildfire detection
> Environmental Protection

Opportunity

ANU is seeking to partner with companies selling imaging hardware to government fire services, and with government fire services to integrate and deploy this algorithm in fire control centre and licence it.

IP status

This IP is owned by The ANU and is subject to patent applications AU2022900387A0 and AU2022900386A0

Key research team

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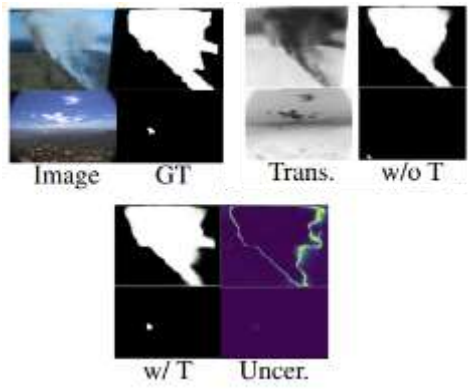

Figure 1: Transmission loss is effective for segmenting smoke. From left, right, below: input images, ground-truth, transmission map, prediction without transmission loss, prediction with transmission loss, and predicted uncertainty.