

Chasing Fog

Difficulties measuring fog

Historically, fog quantification is done with fog gauges like the one shown on the right. However, these can be difficult to install and can collect wind-blow rain as well as fog. Trail cameras offer efficient fog monitoring with automated image capture.



Cameras?

Automating the categorization of trail camera images using machine learning models reduces the time-consuming manual process. However, generalization across different sites remains a challenge, with existing approaches requiring site-specific group-based manual classification achieving an average accuracy of 94%.

Model performance

A dataset of ~24,000 images was collected from 13 distinct sites and manually categorized (diurnal: 4,499 fog, 12,382 clear, nocturnal: 1,910 fog, 5,262 clear). General models were tested using a leave-one-out approach, training models on all sites except the target site, then evaluating their performance. Site-specific models were trained only on data from one site and tested and held out images from that site. To the right there is first a bar chart of performance for the general and site-specific models for nocturnal/diurnal imagery below this is a chart of performance trends when training with more images.

