**Preliminary Outline**

1. **Introduction**
   1. [Remote sensing for wildfire monitoring: Insights into burned area, emissions, and fire dynamics](https://www.cell.com/one-earth/fulltext/S2590-3322(24)00257-4)
      1. Current use and challenges → most sensors are not designed for fire monitoring
   2. [A comprehensive survey of research towards AI-enabled unmanned aerial systems in pre-, active-, and post-wildfire management](https://www.sciencedirect.com/science/article/pii/S1566253524001477)
      1. U-Net based models for segmentation (ResNet for encoder)
   3. [An Architecture for Early Wildfire Detection and Spread Estimation Using Unmanned Aerial Vehicles, Base Stations, and Space Assets](https://www.sciepublish.com/article/pii/206)
   4. [Early Wildfire Detection Technologies in Practice—A Review](https://www.mdpi.com/2071-1050/14/19/12270)
   5. [Computer vision for wildfire detection: a critical brief review](https://link.springer.com/article/10.1007/s11042-024-18685-z)
      1. Issues in current techniques → CV mainly focuses on detection. Drones have limited battery life and data transmission bottlenecks pointing to potential opportunity for ground stations
2. **RGB/Traditional Computer Vision models for detection**
   1. [Machine Learning and Deep Learning for Wildfire Spread Prediction: A Review](https://www.mdpi.com/2571-6255/7/12/482#:~:text=,improvement%20of%20datasets%20and%20metrics)
      1. Benefits of DL approaches over machine learning approaches
   2. [Computer vision for wildfire research: An evolving image dataset for processing and analysis](https://www.sciencedirect.com/science/article/pii/S0379711217302114)
      1. Computer vision for wildfire detection → CNNS / YOLO for real time efficient detection
      2. Computer vision model development needs open, annotated datasets → Corsican Dataset
   3. [FLAME2](https://ieee-dataport.org/open-access/flame-2-fire-detection-and-modeling-aerial-multi-spectral-image-dataset)
      1. Large RGB + IR aerial dataset (videos converted to image frames and identifies fire/no fire and smoke/no smoke)
3. **RGB+IR/Multi-modal models**
   1. [Deep Learning Approach for Wildland Fire Recognition Using RGB and Thermal Infrared Aerial Image](https://www.mdpi.com/2571-6255/7/10/343#:~:text=55,CrossRef)
      1. Framework and testing of RGB+IR ensemble models for fire detection (FLAME2/aerial)
   2. [Wildland Fire Detection and Monitoring Using a Drone-Collected RGB/IR Image Dataset](https://ieeexplore.ieee.org/abstract/document/9953997)
      1. Framework for robust RGB+IR fire detection
4. **Incorporating Descriptors + Use of LLMs for detection**
   1. [Concept Bottleneck Models](https://arxiv.org/abs/2007.04612#:~:text=concept%20bottleneck%20models%20by%20editing,on%20concepts%20at%20test%20time)
      1. Benefits of using an intermediary
   2. [Leveraging Large Language Models for Enhanced Classification and Analysis: Fire Incidents Case Study](https://www.mdpi.com/2571-6255/8/1/7)
5. **Gaps (Human interpretability, etc.)**
   1. Segmentation
      1. [SAMFA: A Flame Segmentation Algorithm for Infrared and Visible Aerial Images in the Same Scene](https://www.mdpi.com/2504-446X/9/3/217)
         1. Flame2 trained model framework for fire segmentation
      2. <https://www.researchgate.net/figure/The-segmentation-results-of-FireFormer-on-the-FLAME2-dataset-with-the-segmentation-of_fig10_382824491>
   2. Forecasting
      1. [A combined real-time intelligent fire detection and forecasting approach through cameras based on computer vision method](https://www.sciencedirect.com/science/article/pii/S0957582022005675)
         1. YOLO to extract key features → input into ResNet