

SoundFire Systems

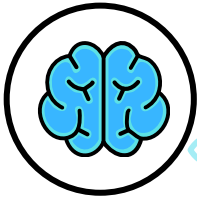
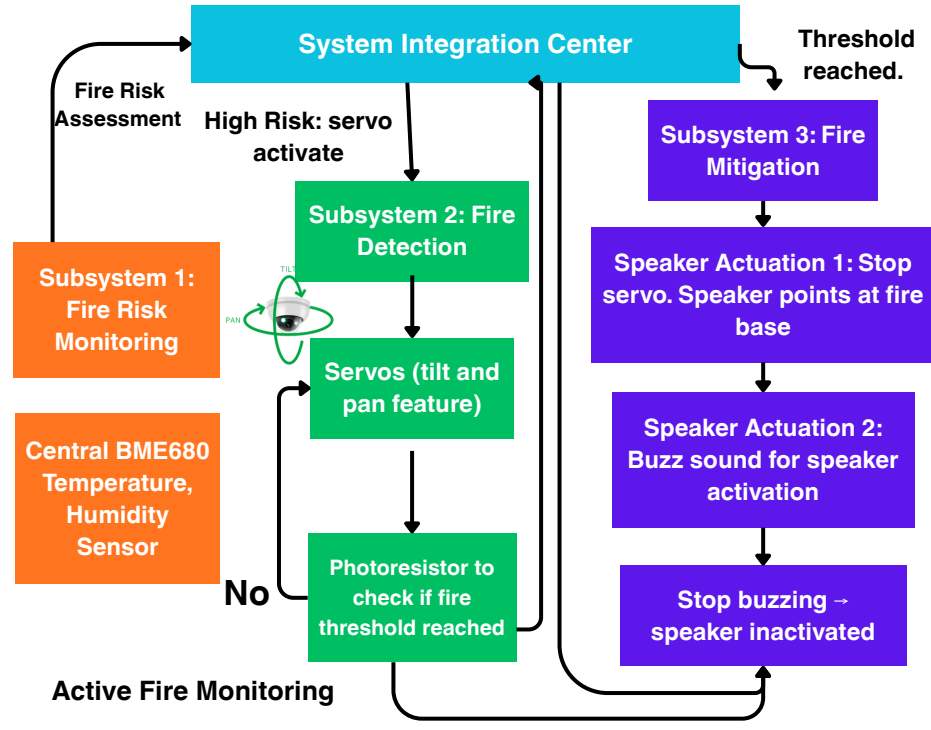
Sound the alarm, Silence the Flame: an acoustic solution to protect Albertan homes from wildfires

Albertan homeowners need a system that eases wait-time for fire personnel by quickly and sustainably monitoring and extinguishing wildfires in vast boreal forests.

Goal: to **detect** and **extinguish** small to medium (0 – 40 hectares) surface wildfires occurring in the summer boreal forests of mountainous regions in Alberta.

TAKEAWAY

Difficult to add speaker-collimator to sensor-actuator system in because of size, kept separate.



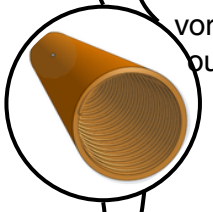
Integration center
Decides action, updates every hour, <math><0.000001\text{s}</math> to actuate

MG992 Servo Motor:
Pan and tilt to monitor, with error less than **0.1cm**.



Collimator- Speaker System:
Subwoofer pumps air out at 30Hz, collimator releases high-speed jet. Radius of impact of **25cm**.

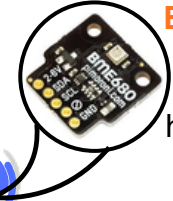
Coils in Collimator:
Increase air velocity through vorticity. Allows fire to be put out in less than **1 minute**.



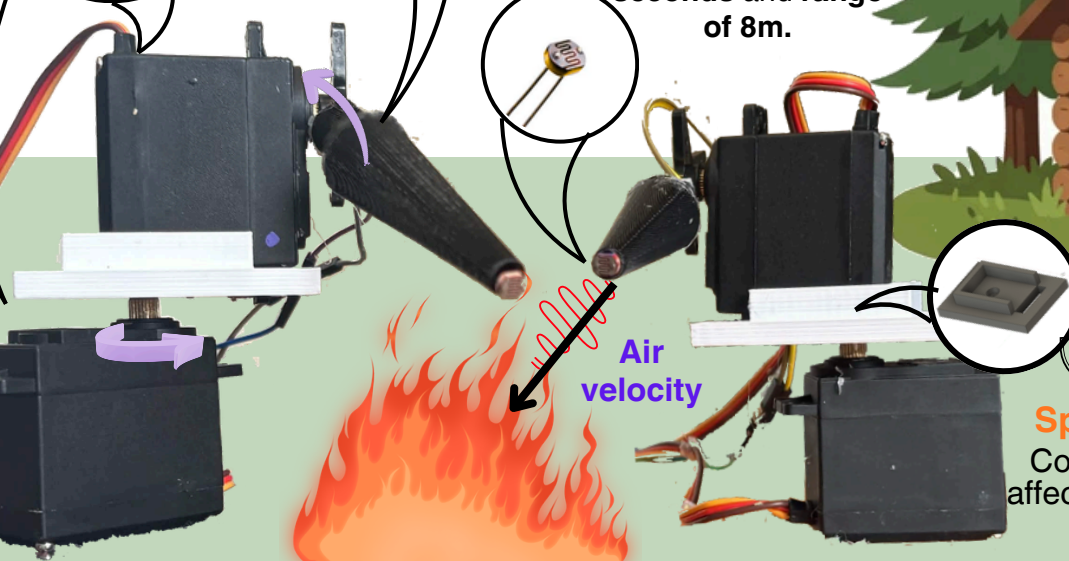
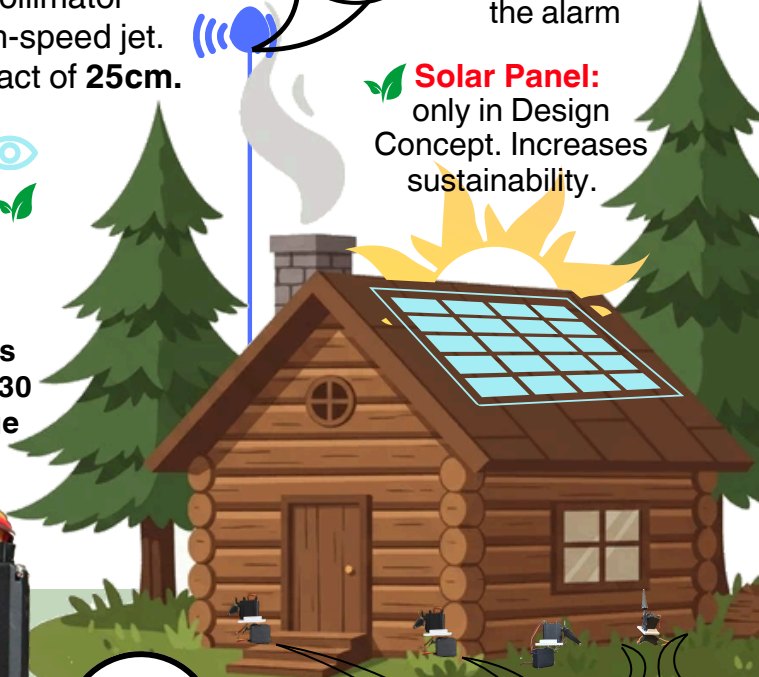
Photoresistor:
accurately detects light intensity within **30 seconds** and range of **8m**.



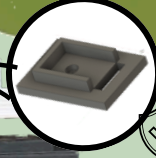
BME680 Sensor:
monitoring temp, pressure + humidity, to sound the alarm



Solar Panel:
only in Design Concept. Increases sustainability.



Servo Stand:
Durably hold system



Spatial Mapping:
Collimators prioritize affected sensor, if fire is local to it.

