LITERATURE SURVEY

RESEARCH PAPERS RELATED TO FOREST-FIRE DETECTION

Infrared image processing and its application to forest fire surveillance. This paper describes a scheme for automatic forest surveillance. A complete system for forest fire detection is firstly presented although we focus on infrared image processing. The proposed scheme based on infrared image processing performs early detection of any fire threat. With the aim of determining the presence or absence of fire, the proposed algorithms performs the fusion of different detectors which exploit different expected characteristics of a real fire, like persistence and increase. Theoretical results and practical simulations are presented to corroborate the control of the system related with probability of false alarm (PFA). Probability of detection (PD) dependence on signal to noise ration (SNR) is also evaluated.

EARLY FOREST FIRE DETECTION USING LORAWAN SENSOR NETWORKS AND DEVICES

The Long Range (LoRa) digital wireless communication technology and the closely related LoRaWAN networks are known for their long range communication capabilities and are extremely suitable for sensor and telemetry applications. The improved range makes these network also suitable for many new applications, including forest fire detection, environmental sensing and long term air-quality analysis. In order to provide LoRaWAN connectivity in the region of Ruse (Bulgaria), the Department of Telecommunications, at the University of Ruse, has established a network of different LoRaWAN gateways. Two types of gateways were installed – IMST iC880A concentrators [16], which were mounted on Raspberry Pi 3 Model B+ microcomputers and Pycom LoPy modules with extension boards.

EARLY FOREST FIRE DETECTION USING UNMANNED AERIAL VEHICLES

The use of aircrafts for early forest fire detection and prevention is not a new idea. According to several sources [6 and 7], aerial firefighting began around 1920 with the first attempts for dropping water from aircrafts onto ongoing forest fires. In these early years for the aviation, the use of planes for actual extinguishing of fires was not so successful, so the focus turned on their use for forest fire detection. In the decades after World War II, the use of aircrafts for forest fighting was resumed [6] and by the late 1960s many airplanes and helicopters [7] were actually involved in it. The use of aircrafts for forest fighting however has proven to be expensive and also dangerous, as the aircraft pilots are pushed to their limits and are expected to fly in dangerous conditions and extremely close to the fires. Numerous accidents with firefighting aircrafts were recorded throughout the years and this has raised the public alert about their reliability and the actual benefits from their use.

Early Forest Fire Detection using Drone

Forest and urban fires have been and still are serious problem for many countries in the world. Currently, there are many different s colutions to fight forest fires. These solutions mainly aim to mitigate the damage caused by the fires, using methods for their early detection. In this project, we developed a new approach for fire detection and control, in which modern technologies are used. In particular, we propose a platform that uses Unmanned Aerial Vehicles (UAVs), which constantly patrol over potentially threatened by fire areas. The UAVs also utilize the benefits from Artificial Intelligence (AI) and are equipped with on-board processing capabilities. This allows them to use computer vision methods for recognition and detection of smoke or fire, based on the still images or the video input from the drone cameras.