

DATA COLLECTION

There are many concerns in automatic fire detection, of which the most important ones are about different sensor combinations and appropriate techniques for quick and noise-tolerant fire detection. Researchers have been studying fires taking place in various places such as residential area (Milke and McAvoy 1995), forest (Yu, Wang et al. 2005; Bagheri 2007) and mines (Tan, Wang et al. 2007) to find some solutions for fire monitoring. An important issue in automatic fire detection is separation of fire sources from noise sources. For the residential fires, being flaming or non-flaming (smouldering smoke fires), the general trend is to focus either on the sensor and sensor combinations or detection techniques. In another word, researchers have ocused either on identifying the best set of sensors which collaboratively can detect fire using simple techniques (Milke and McAvoy 1995; Milke 1999; Cestari, Worrell et al. 2005) or on designing complex detection techniques that use single or at best very small set of simple sensors (Okayama 1991; Thuillard 2000).

Several decades of forestry research have resulted in many advances in field of forest fire monitoring. The Fire Weather Index (FWI) system being developed by the Canadian Forest Service (CFS; Bagheri 2007) and the National Fire Danger Rating System (NFDRS) introduced by the National Oceanic and Atmospheric Administration (NOAA; Yu, Wang et al. 2005) are two examples of such advances. Studying the state-of-the-art techniques reveals two main trends in fire detection, i.e., existing techniques have either considered fire detection as an application of a certain field (e.g., event detection for wireless sensor networks) or the main concern for which techniques have been specifically designed (e.g., fire detection using remote sensing techniques).

The rest of this paper is organised as follows. Section 2 presents related work on residential fire detection. Section 3 introduces some indices for forest monitoring. Section 4 reviews contribution of wireless sensor networks (WSN) for fire detection that may occur in any places. In Section 5 some conclusions are drawn.