

Chapter 22

Public Education Campaigns on AI and IoT Applications in Wildfire Prevention and Management: Fostering Ethics, Responsibility, and Sustainability

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ABSTRACT

This chapter explores the crucial role of public education campaigns in advancing the adoption of AI and IoT technologies for wildfire prevention and management. It introduces a robust communication model tailored for effective public education and an implementation framework designed to actively engage diverse stakeholders, demystify complex technologies, and cultivate trust. By emphasizing tailored messaging, interactive tools, real-world examples, and continuous feedback, the chapter addresses the challenges of technical complexity and public skepticism. The proposed strategies seek to deepen understanding and foster proactive community engagement, ultimately enhancing resilience and safety against wildfires. These insights offer valuable guidance for researchers, practitioners, and policymakers in developing impactful education campaigns to promote the integration of AI and IoT in wildfire management.

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INTRODUCTION

Wildfires have turned out to be one of the most significant future environmental threats in the course of the twenty-first century, as the incidence of dangerous fires, their intensity, and duration have been on the rise globally. Climate change, land usage practices, increased human population/ settlement plus interference with climate in the specific fire-prone regions have aggravated and intensified the risk/ effect of wildfires making it a global issue (Moritz et al., 2012). Australia, California, Southern Europe, and many other countries have felt the wrath of unprecedented wildfires, and in the process, lost many people, properties, and biodiversity (Bowman et al., 2011). In addition to the direct impacts, socio-economic costs of wildfires are very high in terms of damages, health and social impact, changes in the economy, environmental impacts, the loss of ecosystem services (Johnston et al., 2020). Considering the fact that the threat of wildfire is on the rise, efforts need to be made in order to boost methods of managing with the intention of preserving human and natural environments alike.

It is clear that the use of enhanced technologies such as artificial intelligence and the internet of things has advanced in its capability in early perception and management of wildfire. AI variants are widely used to forecast the wildfire frequency by considering factors that are challenging to decipher by humans, such as the weather conditions, vegetation density, and prior fire events (Rein & Huang, 2021). Such models can be used to establish early warning mechanisms that improve readiness and better facilitate the distribution of resources in affected regions. Similarly, IoT technologies like sensor networks and remote monitoring are as valuable for detecting new wildfires as they are for monitoring environmental conditions that could lead to initiation (Vadrevu et al., 2020). For example, in California, there are IoT based systems that are used in monitoring the moisture in vegetation and even atmospheric conditions to help firefighters to note favorable conditions for fire outbreaks (Myoung et al., 2018). AI and IoT together form a synergy of technologies that can supplement the conventional wildfire management practices and decrease wildfire risks as and when they emerge.

However, the key to managing AI and IoT for controlling wild fire requires public sensitivity and knowledge. One must develop an understanding of how these technologies operate, what the advantages might be achieved, and what part people and groups can play in leveraging them (Kapucu & Garayev, 2011). Thus, the objective of this chapter is to elucidate the best approaches to the development and implementation of public awareness campaigns for ensuring the acceptance of AI and IoT solutions in fire safety. Hence, this chapter aims at enriching the process of developing effective assertions to the public through the identification of the target audience, choice of words and phrases to be used, and the application of simple graphics and engaging tools in a bid to ensure the creation of a well-informed society that can easily cope with emerging crises.

STRATEGIES FOR DESIGNING EFFECTIVE PUBLIC EDUCATION CAMPAIGNS

Approaches to promote awareness and acceptance of AI and IoT in wildfire fighting include developing proper marketing and educating the public on these programs and their applications. These campaigns, therefore, need to be effectiveness campaigns reaching the right stakeholders, explaining complicated information and showing real-life implications of such technologies. There are certain the key strategies involved in creating impactful public education campaigns such as focusing on audience identification,

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