

# Arduino-Based Fire Fighting Robot

**Mr. Kardile Shubham Kishor<sup>1</sup>, Mr. Narsale Tanmay Rajkumar<sup>2</sup>, Mr. Dhamane Kiran Suryakant<sup>3</sup>,  
Mr. Shaikh Tansif Riyaj<sup>4</sup>, Prof. A.G.Dekhane<sup>5</sup>**

Department of Mechanical Engineering<sup>12345</sup>

Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

**Abstract:** *Fire is one of the most devastating hazards in both industrial and residential environments. Rapid detection and timely suppression are crucial in preventing loss of life and property. This paper presents an autonomous Arduino-based fire fighting robot designed to detect and extinguish small-scale fires using IR flame sensors, obstacle-avoidance modules, and a servo-controlled water pump system. The robot uses an Arduino Uno microcontroller, flame sensors, an ultrasonic sensor, and a motor driver module to perform its task efficiently. It is a cost-effective and portable system, particularly suited for high-risk zones such as server rooms, gas storage facilities, and domestic kitchens. The modular design allows scalability and integration with IoT for advanced alert systems. Future iterations aim to include AI-enhanced navigation and remote operation capabilities.*

**Keywords:** Arduino Uno, Fire Detection, Flame Sensor, Servo Motor, Autonomous Robot, Embedded Systems

