Technology Offer

Autonomous Portable Firefighting Monitor

KEYWORDS: Autonomous; Extinguinshing System; Fire; Firefighting; Outdoor Firefighting.

The most serious consequences of forest fires are the loss of human lives and the destruction of assets and infrastructure. Current firefighting mechanisms almost always presuppose direct control and handling by an operator, which becomes exposed to the dangers of the fire and very unfavourable conditions such as high temperatures and radiation levels. It is, therefore, necessary to develop new mechanisms to remotely or fully automatically combat fire anywhere, eliminating the need to endanger the lives of firefighters and the population.

All the existing solutions have the issue of not considering the environmental characterization of the area of operation for controlling the system, and therefore, not being able to provide its correct adaption to different indoor and outdoor conditions, which is of an extreme importance for portable autonomous systems.

Our solution is an autonomous portable firefighting system that comprises a nozzle, an operation module and an orientation module. More particularly, the operation module is programmed to control the water flow, the jet velocity and the shape of the water jet coming out of the nozzle, whereas the orientation module is programmed to control the variation of vertical and horizontal angles of the nozzle. In order that the system can operate autonomously, while ensuring the efficiency of its operation, it is comprised by a sensory unit and a control unit. The sensory unit is responsible for collecting sensory data, that is used by a 3D environmental characterization module to generate a virtual three-dimensional space record of the nozzle's surrounding environment. It also possesses a detection module to detect and locate a specific target. The target can be a fire front or a heat source. The control unit is further comprised by processing means programmed to execute a control algorithm which is configured to command the operation of the nozzle unit, based on data provided by the 3D environmental characterization module and by the detection module.

In an advantageous configuration of the autonomous portable firefighting system is comprised by a communication unit for establishing a wireless bidirectional data communication protocol with a remote server or a remote monitoring device, such as a smart phone, a tablet or a computer.

ADVANTAGES	APPLICATIONS
• Possibility of autonomous firefighting at a long range using a live feed from a video camera installed on the nozzle unit and from the sensory unit. • Possibility to transport and quickly assemble the equipment anywhere, provided that water is supplied through a hose. • The use of control algorithms to control the operation of the system allows for optimized firefighting and the use of firefighting resources, including energy and water, by activating the water flow only when required, and by optimizing the direction and flow of this water jet.	• Indoor and outdoor Firefighting. • Protection of critical areas from fire.

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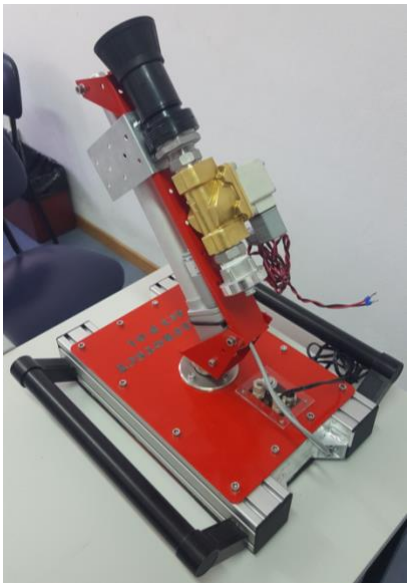

Autonomous Portable Firefighting

Autonomous Portable Firefighting in controlled test

STAGE OF DEVELOPMENT: TRL 4

IPR LEGAL STATUS: Patent Pending n.º PCT/PT2020/050026 filed on 24/06/2020.

OWNERSHIP: The rights to the technology are held by the University of Coimbra and Institute of Systems and Robotics of Coimbra and Association for the development of Industrial Aerodynamics.

COLLABORATION SOUGHT: Licensing for Commercialisation.

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