

Prometeo. The robot that saves lives

Prometeo is a robot that helps rescue teams find victims in catastrophe situations.

A joint analysis by the UN and the Center for Research on the Epidemiology of Disasters (CRED) confirms that natural disasters are now more intense and deadly. In 2016 there were losses amounting to more than € 175,000 million, affecting 411 million people and causing 7,628 deaths.

Prometeo is a small robot inspired by the morphology of the hexapods. However, its legs are not conventional, but have a "C" shape which allows it to move through difficult terrain and overcome obstacles like stairs. Thanks to this, it can be introduced in places where robots with wheels or caterpillars would be stuck. Therefore, it shows the rescue teams the situation, so that they can evaluate how to act without having to put their lives at risk.

Technology solution supported by the Technical University of Madrid

Technology solution

It is a hexapod robot designed for rapid deployment in emergency situations.

Its configuration of 6 legs and their morphology makes it able to move through abrupt and unfavorable lands, places where commercial robots with wheels or caterpillars can not move. Furthermore, it is reversible; this means that if the robot overturns for any reason, it can continue moving in this position.

This represents a great advance compared to conventional methods for rescue tasks because it can enter more than 3 meters as it happens with poles. Thanks to its legs system it is able to overcome more obstacles than other robots.

Areas of application

- ICT applied to robotics and cognitive systems.
- Search and rescue teams for catastrophes: official bodies (fire and civil protection consortiums), military units (Military Emergency Unit), specialized organizations (Federal Emergency Management Agency, CRASAR).

"The rescue teams are at great risk in each operation; the robots can be their allies and anticipate what they will find"



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Market demands

▪ Search and rescue teams

- Search and rescue teams are more effective if they have information on the area where they have to act.
- The automation of some tasks can mean saving time, which increases the possibility of finding survivors.
- The use of dogs is limited just to some applications: they need to rest, suffer injuries, ...
- The poles only provide timely information to the rescue teams and up to 3 meters depth.
- Even if a dog enters, it can only verify if a survivor has been found, not the existent risks located in the path or the most optimal route.
- Survivors often need medical/psychological advice while their rescue is in progress. They need communication with the outside world.



"It is as important to save lives in a catastrophe, as rescue teams do not suffer any injury because they are unaware of the environmental dangers"

Market potential

- Search and rescue teams have a very large social impact given the importance of possible losses of human beings that their scope of action may entail.
- In 2016, the item for the UME amounted to 133 M€, of which 5 M€ is in material investment. In 2017 it amounts to € 136.
- Devices have been discovered to find dead bodies in catastrophes that have not been effective (more than 700 units of the GT200).
- From 2001 to 2014 there were a total of 43 interventions worldwide with robots. In 2017, the average of interventions was exceeded due to the events between August and October in the Caribbean Sea area and the Gulf of Mexico.
- The customer market is global.

Competitive advantages

- The robot has been specifically designed for search and rescue tasks, unlike others specially adapted for these tasks.
- It has more range than conventional poles currently used, it is only 3 meters and can not enter winding places.
- It does not require an expensive training or a demanding care as the dogs selected for these tasks. The training programme lasts more than 200 sessions and you have to add care costs for dogs and the caregiver.
- It allows to maintain an audiovisual contact with victims while they are rescued.
- It is capable to generate a 3D reconstruction of the scenario where it is circulating so that the rescue teams know the situation.
- It has a locomotion system that is able to overcome obstacles such as debris or stairs.

References

- The project is being developed by the Robotics and Cybernetics Group at the Automatics and Robotics Center (ETSII-UPM-CSIC), which has been developing projects at a European level since 1982.
- The group has had collaborations with international companies such as Sener, GMV, Robotnik.
- For the development the Project has obtained a financing of the government of Spain by means of a national plan project.

Development stage

- ☐ Concept
- ☐ R & D
- ☒ Lab-Prototype
- ☐ Industrial Prototype
- ☐ Production

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