AI for Good
Robotics for Good
Youth Challenge

Robotics For Good

Youth Challenge, Nigeria

Guideline

NEXT ROBOTICS

ITU

Theme of the Challenge

Global climate changes are intensifying the risk and severity of large-scale natural disasters, such as excessive heat, persistent drought, and other extreme phenomena, including torrential rains, landslides, flash floods, earthquakes, hurricanes, and wildfires. These tragic events necessitate a rapid and accurate response to find and rescue survivors when every minute counts.

In response to these crises, robots can provide a swift and precise solution. They limit human exposure to hazardous emergencies and make aid delivery safer, more efficient, and cost-effective. Notably, these robots utilize carbon-neutral energy sources, aligning with global sustainability goals.

Robots can significantly expedite search and rescue operations. With their assistance, emergency service managers can access geological maps, damage assessments, and facilitate rubble removal and medical supply delivery more accurately.

Technology and artificial intelligence also offer crucial support to first responders in perilous situations like fires, natural disasters, and other emergencies. Specialized robots, capable of navigating hazardous environments, limit the need for human intervention. They not only facilitate the rescue of survivors but also enhance the safety of emergency professionals.

These robotic capabilities can optimize response times, spur innovation, and crucially, save lives. When faced with such intricate challenges, advancements in robotic technology translate to improved response capabilities in emergency situations and disaster management.

Recognizing the significance of this issue, the Robotics for Good Youth Challenge 2024-2025, based on the *ROBOCAT 2024*, organized by El Racó dels Robotaires, has a primary focus on natural disasters, particularly earthquakes. Seismic risks necessitate prediction work, soil and subsurface studies, and seismic-resistant construction standards. However, when an earthquake strikes, immediate intervention is crucial to mitigate its destructive effects.

International aid reflects solidarity for populations affected by disasters, like those resulting from geological risks. Robots equipped with infrared and thermal cameras, microphones, and sensors provide crucial assistance in locating people in danger. They relay vital information to rescue teams from initially inaccessible locations, acting as a critical link between survivors and emergency services.

These robots contribute significantly to the rescue mission, reducing the risk to human teams, especially in situations with partially collapsed buildings. For instance, robots with gas sensors can alert rescue teams of explosion risks from damaged gas pipelines. They can also assist in subsequent recovery efforts in the affected areas.

The competition encourages participants to design a robot centered around managing a seismic emergency, while reflecting on the current and future state of robot technologies and their application in disaster situations.

We urge the younger generations to contemplate and create new possibilities for robotics in disaster response. Participating teams can contribute to developing innovations, which are much needed in the field of prevention, prediction, rescue, and recovery in affected populations.

Mission for the Teams

The National Seismological Institute has reported a devastating 7.2-magnitude earthquake in the capital. Your rescue team, renowned for its expertise and innovative technology in rescue operations, has been summoned by the municipal emergency coordinator to assist with rescue and evacuation efforts. Without a second's hesitation, you spring into action, preparing to intervene. En route, you receive the situation report:

1. The city is located near a geological fault, and it has already experienced earthquakes of lesser magnitude. Due to this, most of the buildings have been constructed using techniques that make them resilient to earthquakes and have not suffered significant damage.
2. The foundations of one of the apartment blocks closest to the epicenter have suffered severe damage. The building could not withstand it and has collapsed. Most of the residents have been able to escape, but some have been trapped. First response teams estimate that there are 9 people under the rubble and potentially injured.
3. Due to the earthquake, several communication routes have been damaged. Engineers and workers are already on their way to repair them, but it will take some time, and therefore, you cannot count on external help.
4. Some buildings have suffered minor damage. Firefighters will inspect the buildings to ensure they are safe, but until then, the inhabitants must be evacuated to the designated shelter.
5. Some pipes have broken and caused holes in the roads. Between this and the rubble, some streets have become impassable. Evacuees cannot reach shelters, and ambulances have difficulty picking up the injured. Engineers and workers are already on their way to repair them, but it will take time, and time is pressing.

Your team is tasked with rescuing the individuals with critical injuries, both within and outside the affected building, and transporting them to the hospital. Simultaneously, you are responsible for evacuating the remaining unharmed individuals to the designated shelter. While executing this mission, it is imperative to exercise utmost caution, as several structures have suffered significant structural damage and may collapse. Therefore, meticulous maneuvering is crucial to prevent further damage that could pose additional risks to the affected individuals.

Challenge Categories

1. The category of the participating team is assigned according to the year of birth, from January 1st to December 31st: Junior (2013 - 2010) and Senior (2009-2006). These are the recommended categories, however, there might be modifications according to countries specific need and educational systems.
2. If you are a team made up of participants who belong to different categories, the category in which you will compete will be chosen according to the age of the oldest participant.
3. Teams can consist of up to 8 members. Individual participation is also allowed.
4. Each team has a coach or mentor. If over 18 years old, the coach or mentor can be
5. one of the team's participants.
6. Teams only play with other teams belonging from the same category.

Teams

1. Number of Teams in the Robotics for Good Youth Challenge National Event: It is recommended that the number of participating teams in an event does not exceed 40 teams. However, there is no upper limit to the number of teams. The minimum number of teams for organizing a Robotics for Good Youth Challenge is 16 teams, from at least 10 different schools or entities. In exceptional cases, due to constraints related to the number of eligible educational institutions within the region, this can be reduced with prior authorization from the ITU.
2. Number of Teams per Entity: No more than 6 teams per school or entity are allowed to participate in the Robotics for Good Youth Challenge National Event. The National Organizer may decide to reduce this number to one team in case of limited availability. Consequently, the school or entity might need to host a Micro- Robotics for Good Youth Challenge Event to decide which team will participate in the National Event.