Automated Fire Blanket Deployment Robot for Enhanced Fire Safety

Engineering

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How can an automated fire blanket deployment robot be designed and implemented to enhance fire safety in residential and commercial buildings?

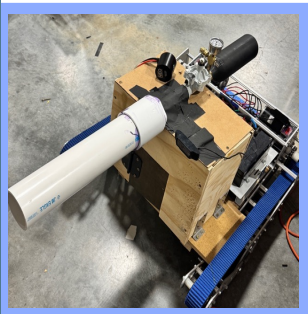
EMPATHIZE

Understanding the critical need for enhanced fire safety, especially in environments where quick response can save lives and property, is paramount. The development of an automated fire blanket deployment robot addresses this need by providing a reliable and efficient solution. This technology aims to reduce the risk of fire-related injuries and damage by ensuring rapid deployment of fire blankets in emergency situations. By empathizing with the concerns of individuals and businesses regarding fire safety, this project seeks to offer peace of mind and a proactive approach to fire prevention, ultimately contributing to safer living and working spaces.

DEFINE

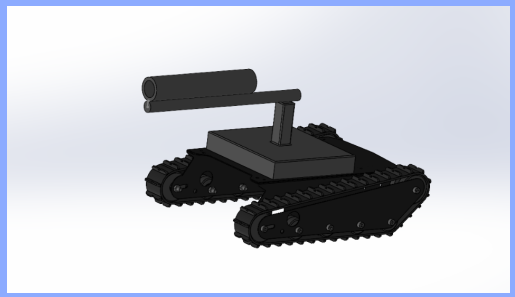
The goal of this project is to design and implement an automated fire blanket deployment robot that enhances fire safety and provides first aid support in residential and commercial buildings. This robot will be equipped with sensors to detect fire and deploy fire blankets swiftly and accurately to contain and extinguish flames. Additionally, it will include a first aid kit to offer immediate medical assistance in case of injuries. By automating the deployment process and integrating first aid capabilities, the robot aims to reduce response time and improve the effectiveness of emergency measures. The project will focus on developing a reliable, user-friendly system that integrates seamlessly into existing safety protocols, providing an additional layer of protection and peace of mind for occupants.

PROTOTYPE



Our prototype features a pneumatic cannon designed to rapidly deploy fire blankets in emergency situations. The cannon ensures quick and accurate blanket deployment to contain and extinguish flames effectively. Additionally, the robot includes a compartment housing a first aid kit, providing immediate access to medical supplies for treating injuries. This combination of fire suppression and first aid capabilities enhances overall safety and emergency response efficiency.

IDEATE



We used SolidWorks to visualize and refine our concept for the automated fire blanket deployment robot. By creating detailed 3D models and simulating various scenarios, we were able to test the robot's mechanisms and ensure its functionality. This process helped us develop a robust prototype that meets our goals for enhancing fire safety and providing first aid support.

TEST

During testing, we evaluated the performance of the pneumatic cannon at various pressure levels to ensure effective fire blanket deployment. At 40 psi, the cannon successfully deployed fire blankets to a distance of 5 feet, suitable for small, localized fires. Increasing the pressure to 60 psi resulted in a deployment distance of 15 feet, providing coverage for medium-sized areas. At 80 psi, the blankets were propelled to 20 feet, demonstrating the cannon's capability to handle larger fire scenarios. Finally, at the maximum pressure of 120 psi, the cannon achieved an impressive deployment distance of over 40 feet, ensuring rapid response for extensive fire emergencies. These tests confirmed the pneumatic cannon's versatility and effectiveness in covering different areas based on the severity of the fire and the required response distance, enhancing overall safety and emergency preparedness.

Acknowledgements

Jeffrey Rosen, Engineering

Joesph Denato, Engineering

Daniel Huntley, Engineering