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Radioactive Metal Detection in Dustbin using Metaheuristic with Augmented Reality for Enhanced Safety and Security

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C. Preethi ; S Shahul Hammed ; K Haripriya ; S. Pavalarajan ; V. S.Shree Saran ; R Pranesh Raj Meikannan **All Authors**

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Abstract:
Enabling everyday objects to collect, exchange, and analyze data, the Internet of Things (IoT) is a technology paradigm that has the potential to revolutionize industries through data-driven decision-making, automation, and efficiency. IoT's fundamental principles and applications are succinctly summarized in this abstract, with emphasis on its role as a catalyst for the Fourth Industrial Revolution. Its ubiquity in various domains, such as smart homes and industrial automation, highlights its importance in shaping our interconnected world. With this in mind, we are encouraged to explore the vast opportunities and challenges presented by the IoT ecosystem. In industrial, medical, and research environments utilizing radioactive materials, ensuring radiation safety and security is essential. An important measure in preventing harm to staff and surroundings is identifying and segregating radioactive metal objects. Introducing an innovative camera-based approach for augmenting the detection of such objects is the aim of this abstract.In order to develop a reliable and real-time detection system, our suggested Radioactive Metal Detection Bin (RMDB) integrates cutting-edge camera systems with powerful image processing algorithms.To acquire pictures of items moving across the detecting region, the RMDB system places high-resolution cameras strategically. These cameras have specific sensors and filters that are made to find gamma radiation coming from radioactive metals.

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Contents

In several fields, including nuclear power, healthcare, research, and waste management, it is crucial to handle radioactive materials safely. There are serious concerns to both human health and the environment when radioactive metal items are unintentionally present in sensitive areas. Implementing reliable and effective detection technologies that can quickly identify and isolate radioactive metal items is crucial to reducing these dangers. This introduction lays the groundwork for a revolutionary approach that uses camera-based technology to improve the detection of radioactive metal items and safety precautions—the Radioactive Metal Detection Bin (RMDB).

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