(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :08/04/2025

(21) Application No.202531034314 A
(43) Publication Date : 18/04/2025

(54) Title of the invention : COST-EFFECTIVE IOT-BASED RAILWAY SIGNALING SYSTEM FOR PREVENTING TRAIN-ANIMAL COLLISIONS

(51) International classification	:B61L0023060000, A01M0029100000, A01M0029180000, A01M0029160000, G01V0001000000
(86) International Application No Filing Date	:NA :NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

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(57) Abstract :
The present invention relates to a cost-effective IoT-based railway signaling system designed to prevent train-animal collisions in jungle areas. The system integrates ultrasonic sensors to detect approaching trains and animals near railway tracks. A microcontroller processes the detection signals and activates multi-sensory warning devices—sound buzzers, LED flashlights, and vibrators—positioned along the tracks to deter animals from entering the danger zone. Additionally, the system includes an animal detection component that calculates the proximity of animals to the train and provides real-time position data to railway operators. The system operates autonomously with minimal infrastructure, utilizing renewable energy sources and ensuring continuous operation in remote areas. The invention offers an effective solution to reduce train-animal collisions, enhancing both wildlife safety and railway operations, while being adaptable to various railway environments and animal species.

No. of Pages : 19 No. of Claims : 10