SmartMetro: Creating a Sustainable Transport Strategy With Energy Efficiency and Congestion Management

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The increasing opportunities in large cities drive population influx, leading to a surge in public transportation usage. This results in congestion, delays, and safety concerns. Additionally, many commuters use metro and buses for short distances, further intensifying overcrowding and operational inefficiencies. Expanding infrastructure is costly and time-consuming, making optimization a more feasible solution. SmartMetro aims to address these challenges through AI-driven innovations. The project integrates real-time passenger flow monitoring using cameras and sensors in metro stations. This data is utilized to provide optimal travel recommendations via mobile applications and regulate passenger distribution for a more balanced transit network. To enhance energy efficiency, innovative technologies are implemented, such as triboelectric nanogenerators (TENG) that convert passenger movement into electricity and vertical wind turbines that harness airflow from moving trains. Additionally, electromagnetic generators in turnstiles capture rotational energy for power generation. SmartMetro focuses on enhancing existing infrastructure with advanced technologies, ensuring a more sustainable, safe, and efficient public transport system. By mitigating congestion and safety risks, the project also contributes to environmental sustainability and energy conservation.

Awards Won: