Application of Hybrid Energy Systems Based on Triboelectric Nanogenerators to Intelligent Transportation Systems

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The development of new forms of energy sources and their adaptation to the environment is thought to be the primary priority path for resolving the energy crisis and global climate change, two of society's most pressing issues. In this respect, obtaining and responsibly using electricity from the environment (alternative energy sources) is a promising strategy that is put into practice for a variety of objectives. Currently used on highways are traffic lights, light poles, traffic signs, etc., which require an extra energy source to operate. When there is no power, these systems have trouble functioning. Additionally, over time, materials like paint and metal used in crosswalks and traffic signs deteriorate and fail. Wide roads are more likely to experience accidents as a result of these processes. The primary objective of the project is the creation of a hybrid system that transforms biomechanical energy from the breeze, sun, and human movement into electrical energy for use in smart transportation technology. As a result, a significant amount of wind energy is produced in the course of daily living during the rapid movement of cars on highways, and this energy is wasted. Additionally, the biomechanical energy produced by human movement is not efficiently utilized. The project will be used to create a hybrid system of triboelectric nanogenerators that can generate and release energy into the environment safely. This energy will subsequently be used to power sophisticated transportation systems. Because of smart transportation technology, it will be feasible to provide electricity and decrease the number of accidents with the aid of traffic lights, light poles, road signs, etc. created within the project.

Awards Won:
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