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(57) Abstract :
The proposed invention introduces an Aerodynamic Wing Design with Dynamic Morphing for Optimal Lift-to-Drag Ratio, representing a pioneering leap in aviation technology. This system comprises dynamic morphing mechanisms, smart materials, and advanced control systems that enable continuous adjustments to aircraft wing shapes during flight. By incorporating shape memory alloys and employing artificial intelligence algorithms for autonomous monitoring, the system optimizes aerodynamic performance by reducing drag, improving lift, and enhancing maneuverability. The applications span across a wide spectrum of aircraft, including commercial airliners, military planes, unmanned aerial vehicles, and spacecraft. Additionally, the innovation extends to rotary-wing aircraft, enhancing their efficiency and versatility, particularly in applications like emergency response and urban air mobility. Furthermore, dynamic wing morphing holds promise for space exploration, facilitating precision landings on celestial bodies. Ultimately, this invention has the potential to revolutionize air travel, offering increased efficiency, reduced emissions, and enhanced sustainability, thereby shaping the future of aerospace engineering.

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