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In the Pursuit of Eco-Friendly Wind Energy – Unmanned Aerial Systems and Computational Strategies

The project Drones4Bats, funded by the BMWK, employs computational methodologies with autonomous unmanned aerial systems (UAS) to enhance bat-friendly wind turbine systems (WTS) operation and increase wind energy output. It involves developing and comparing various UAS technologies, including Multicopters, specialized bat-friendly UAS, and lighter-than-air UAS. Key computational methods include advanced algorithms for wind turbine blade detection using 77GHz radar, secure ranging and autonomous landing with Ultra-Wideband for recharging, integrated into diverse flight stacks. The project systematically examines UAV impacts on bats, explores economic and ecological potential, and utilizes machine learning algorithms for cloud-based data evaluation. Field-testing shall optimize WTS siting, minimize shutdowns, reduce bat fatalities, and accelerate renewable energy production, addressing the green-green dilemma of climate protection and species conservation.

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Keywords

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Autor: Prof. TAEFI, Tessa T. (Hochschule für Angewandte Wissenschaften Hamburg)

Co-Autoren: Dr. ROSWAG, Anna (Vespertillio Faunistische Untersuchungen); Herr PEKLAR, Gerald (NXP Semiconductors Hamburg); Herr ROSWAG, Marc (Hochschule für Angewandte Wissenschaften Hamburg); Dr. ROSWAG, Matthias (Vespertillio Faunistische Untersuchungen); Herr STÖLZEL, Sven (WindStrom Erneuerbare Energien); Prof. KUNZ, Veit Dominik (Hochschule für Angewandte Wissenschaften Hamburg)