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Detect to Avoid: Supporting Aviation Safety with Bird Movement Information

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The presented research evaluates the concept of providing an airport's Air Traffic Control with a bird strike advisory system. Such a system informs the controller about current and predicted bird movements in the arrival and departure corridors. Based on this information, the controller can decide to delay or reroute air traffic in order to prevent collisions with birds. To evaluate the resulting effects on the airport's safety and capacity, fast-time simulations merging air traffic and bird movements, will be performed. To represent realistic bird movements, inputs from two different radar types are combined. For the close airport environment, historic bird tracks from avian radar installed at the considered airport serve as source. To cover the arrival and departure corridors up to 3000ft, the altitude up to which the largest majority of bird strikes occur, data from weather radar is used: based on bird densities and speed directions, bird tracks are generated for different altitude bands. The obtained tracks from avian and weather radar are combined in order to retrieve the overall image of bird movements in the close and extended airport area. This paper describes the methods for extracting, generating and finally combining the inputs from the two radar sources, in order to generate realistic bird movements. These will serve as a key input parameter for evaluating the effects of a bird strike advisory system with fast-time simulations.