

The UAV Feasibility Trajectory Prediction Using Convolution Neural Networks

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Abstract : Wind direction and uncertainty are crucial in aircraft or unmanned aerial vehicle trajectories. By computing wind covariance matrices on each spatial grid point, these spatial grids can be defined as images with symmetric positive definite matrix elements. A data pre-processing step, a specific convolution, a specific max-pooling, and a specific flatten layers are implemented to process such images. Then, the neural network is applied to spatial grids, whose elements are wind covariance matrices, to solve classification problems related to the feasibility of unmanned aerial vehicles based on wind direction and wind uncertainty.

Keywords : wind direction, uncertainty level, unmanned aerial vehicle, convolution neural network, SPD matrices

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