

# Predicting Go-around Occurrence with Input-Output Hidden Markov Model

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Abstract— In this work, we propose a probabilistic graphical model – Input-Output Hidden Markov Model (IO-HMM) – to make sequential predictions of go-around probabilities for a flight approaching its destination airport. We compare the performance of the IO-HMM against four popular machine learning models trained at every nautical mile to the landing runway threshold on a collection of metrics. Our experiment with approximately 100,000 flights in the JFK airport suggests that the IO-HMM in general outperforms other models due to its capability of capturing the inherent temporal structure of the entire flight sequence.