

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

2006 Bird Strike Committee USA/Canada, 8th
Annual Meeting, St. Louis, MO

Bird Strike Committee Proceedings

August 2006

BIRD CLASSIFICATION IN NOISY ENVIRONMENTS: THEORY, RESULTS AND COMPARATIVE STUDIES

Y. Zhang

Intelligent Automation, Incorporated, Rockville, MD

C. Kwan

Intelligent Automation, Incorporated, Rockville, MD

D. Lao

Intelligent Automation, Incorporated, Rockville, MD

Y. Deng

Intelligent Automation, Incorporated, Rockville, MD

Follow this and additional works at: <https://digitalcommons.unl.edu/birdstrike2006>



Part of the [Environmental Health and Protection Commons](#)

Zhang, Y.; Kwan, C.; Lao, D.; and Deng, Y., "BIRD CLASSIFICATION IN NOISY ENVIRONMENTS: THEORY, RESULTS AND COMPARATIVE STUDIES" (2006). *2006 Bird Strike Committee USA/Canada, 8th Annual Meeting, St. Louis, MO*. 38.

<https://digitalcommons.unl.edu/birdstrike2006/38>

This Article is brought to you for free and open access by the Bird Strike Committee Proceedings at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in 2006 Bird Strike Committee USA/Canada, 8th Annual Meeting, St. Louis, MO by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

From *Abstracts of the Proceedings of the 8th Bird Strike Committee USA/Canada Annual Meeting*, 21-24 August 2006, St. Louis, Missouri USA (www.birdstrike.org) - Posters

(P11) BIRD CLASSIFICATION IN NOISY ENVIRONMENTS: THEORY, RESULTS AND COMPARATIVE STUDIES

Y. Zhang, C. Kwan, D. Lao, and Y. Deng, Intelligent Automation, Incorporated, 15400 Calhoun Dr., Suite 400, Rockville, MD 20855 USA

Bird classification plays an important role in minimizing collisions between birds and aircraft. It is a challenging task to perform the sound-based classification correctly in a noisy environment. This paper addresses robust techniques that can improve the classification of bird in noisy environments. A complete recognition system is described and evaluated on a bird sound database containing 1547 bird sound files, with 11 bird species. Two types of features were extracted from the sound files: Mel Frequency Cepstral Coefficient (Mfcc) and Relative SpecTrAl (RASTA). Also, two statistical classifiers were developed using Gaussian Mixture Models (GMM) and Hidden Markov Models (HMM), respectively. The performance of these features and models are compared. Very good recognition rates (97% for clean data and 92% for 5dB signal-to-noise ratios) have been achieved when proper feature and model were selected.