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Digital Patterning of Noise for Intentional Misclassification of Spectra

An advanced data analysis algorithm subtly modifies input data to significantly improve the confidence and accuracy of data classification and mining applications.

Researchers at Purdue University have developed an algorithm that subtly changes input data to induce misclassification to improve linear discriminant analysis of data. Linear analyses complement deep neural networks by providing straightforward statistically tractable avenues for mining high-dimensional data. The algorithm developed by Purdue researchers can remove "over-fitting" numerical instabilities inherent in common linear discriminant analysis methods. The algorithm was used to produce subtle spectral changes that were undetectable to the human eye to misclassify Raman spectra, in turn leading to major improvements in the statistical confidence with which spectra were assigned to different chemical species. This algorithm is compatible with broad classes of data analysis challenges, in which linear analysis methods play a primary or supporting role.

Advantages:

-Undetectable data misclassification

-Identification of stronger classifiers

Potential Applications:

-Data Mining /Classification

-Military/Defense

-Spectroscopy/Measurement Science

TRL: 5

Intellectual Property:

Technology ID
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Category
Artificial Intelligence & Machine Learning/AI Model Optimization & Acceleration Tools
Aerospace & Defense/Defense Electronics & Surveillance Technologies

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