

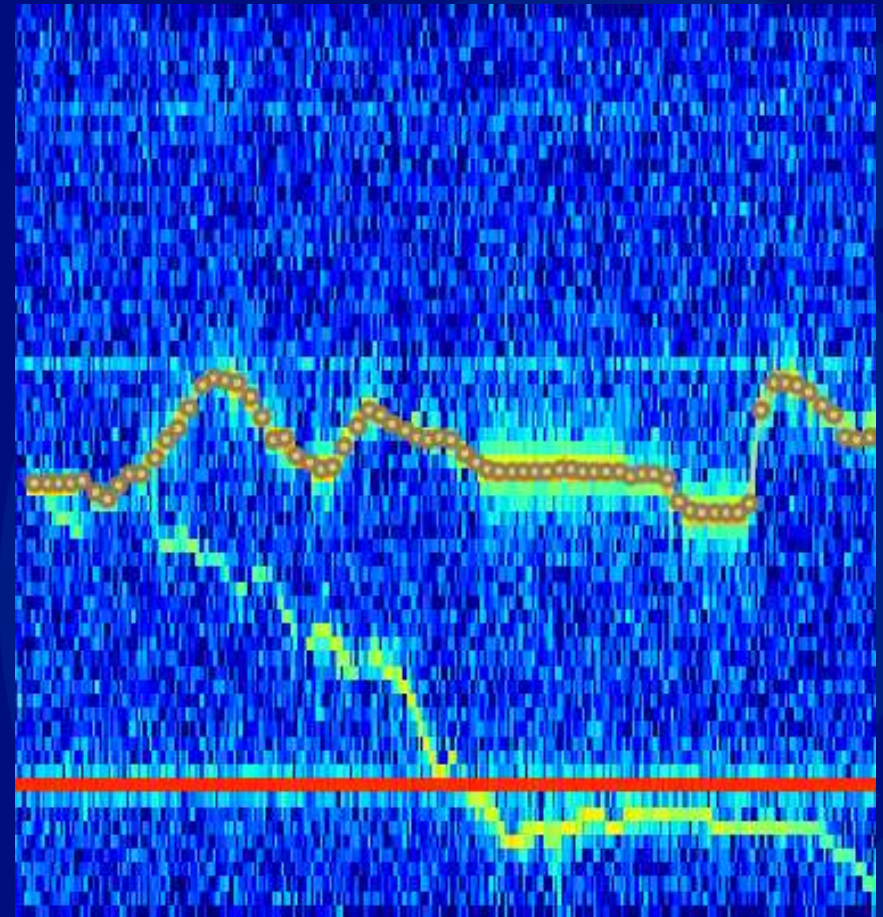


Progress in Direct Waveform PDV Analysis Through Machine Learning

Adam Susser

May 19th, 2025

LA-UR-26-23734

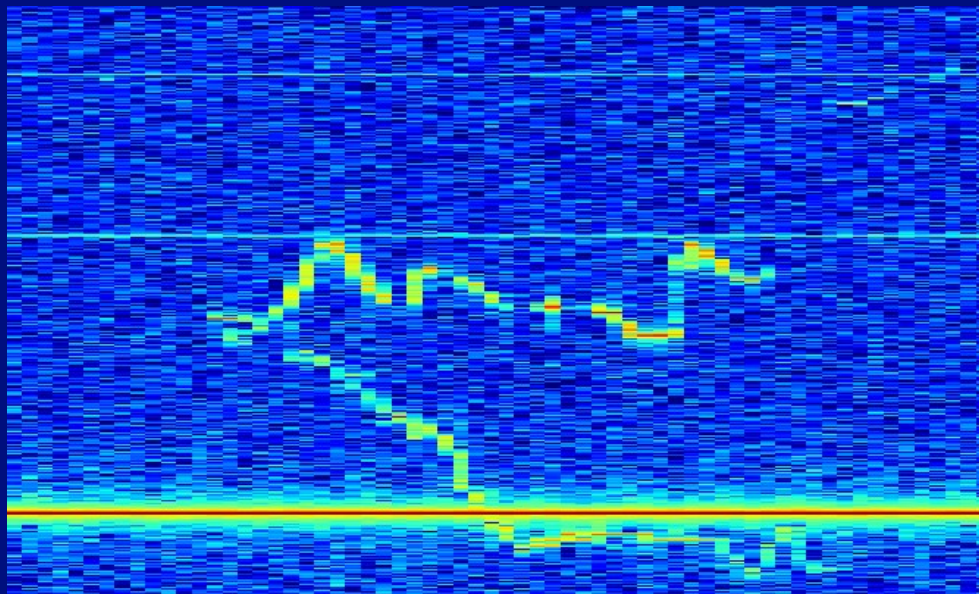




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➔

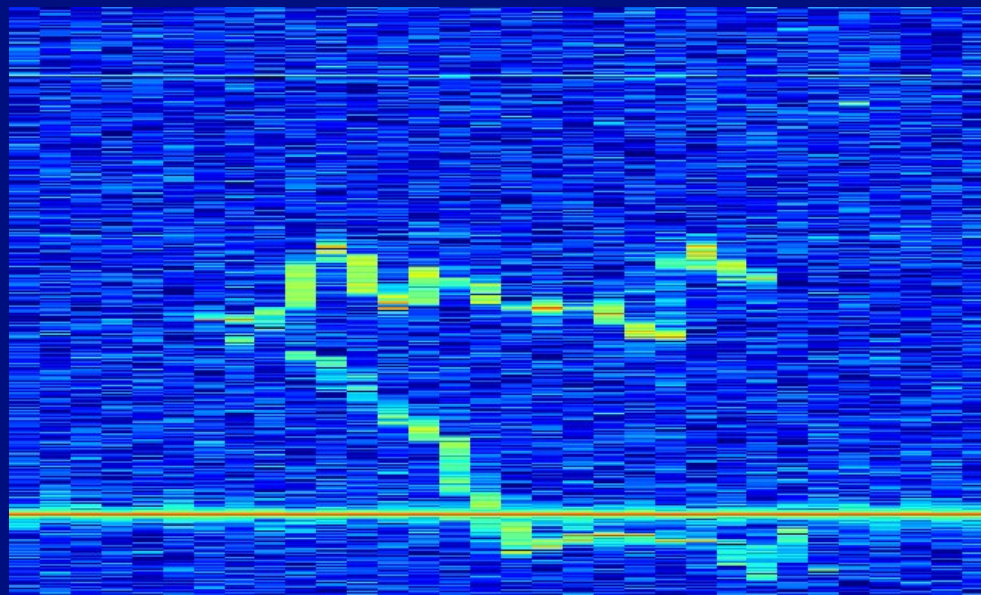


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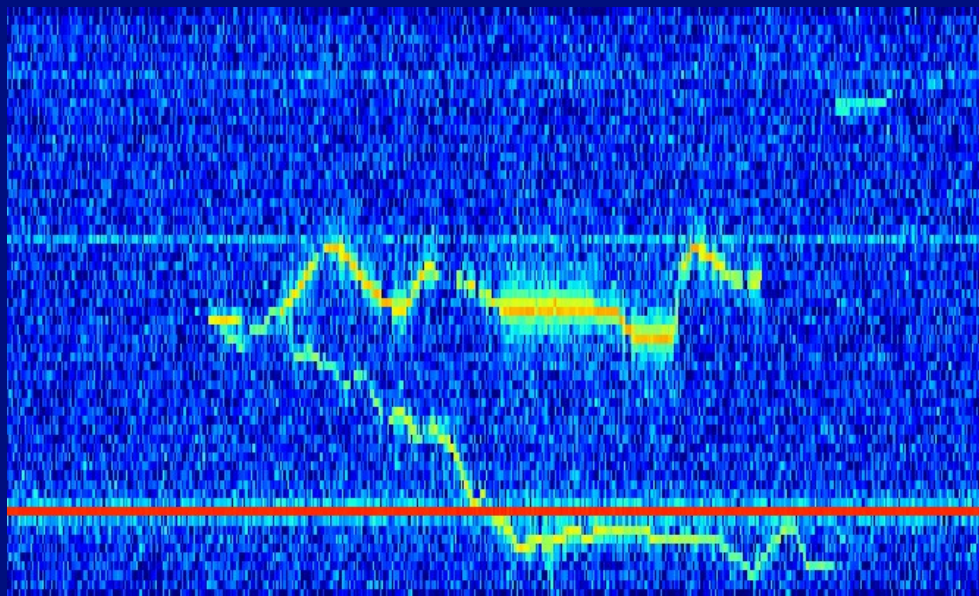


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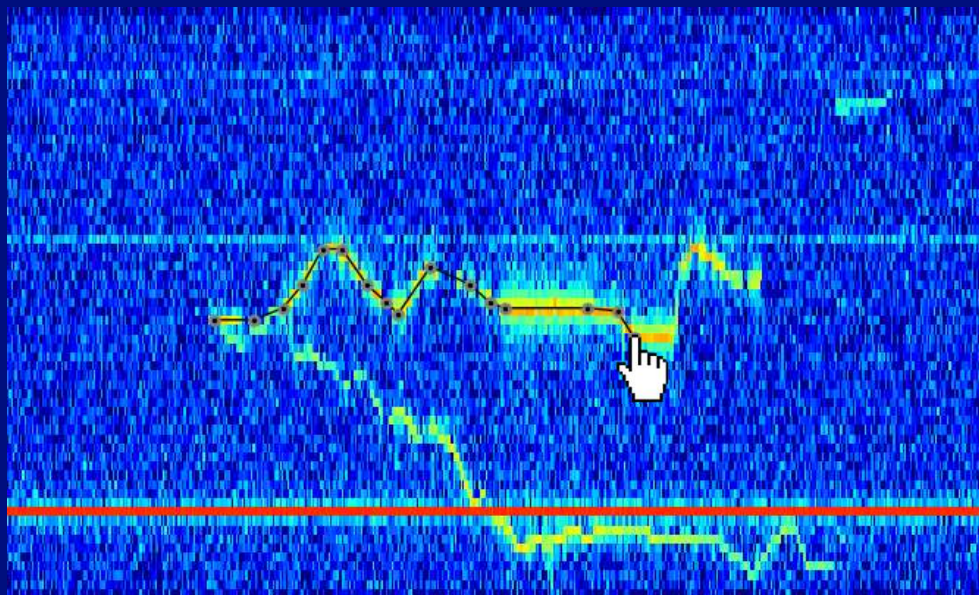


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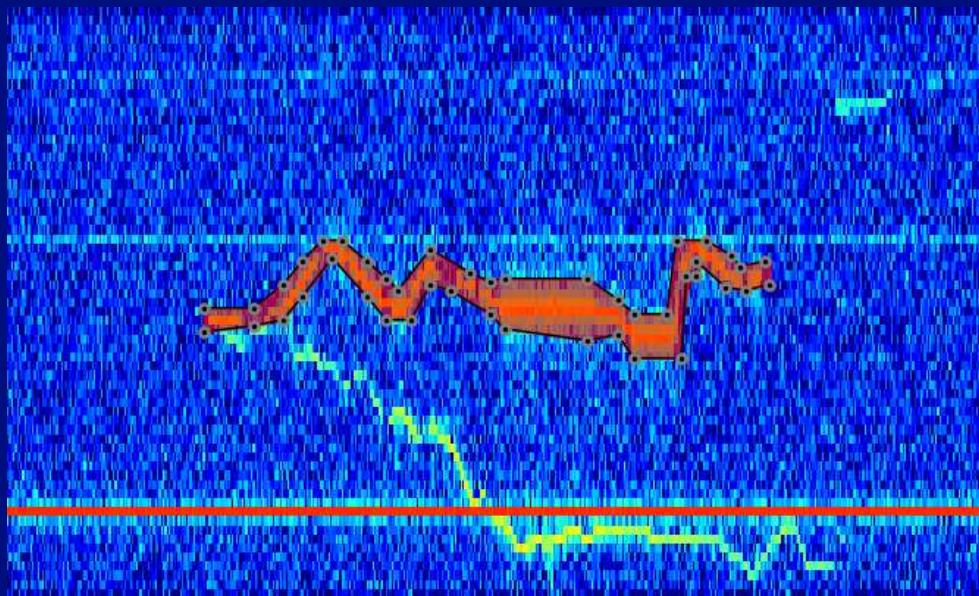


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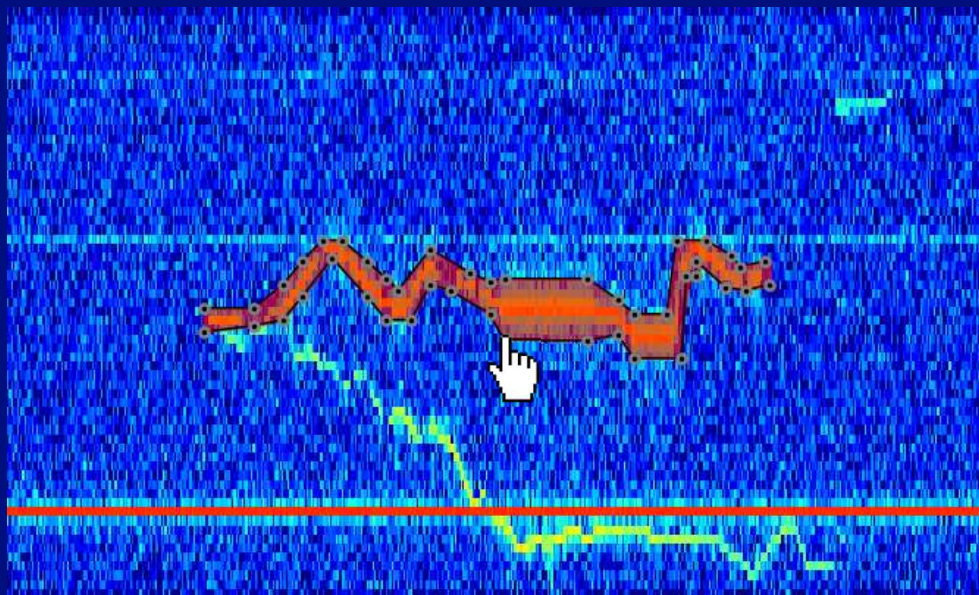


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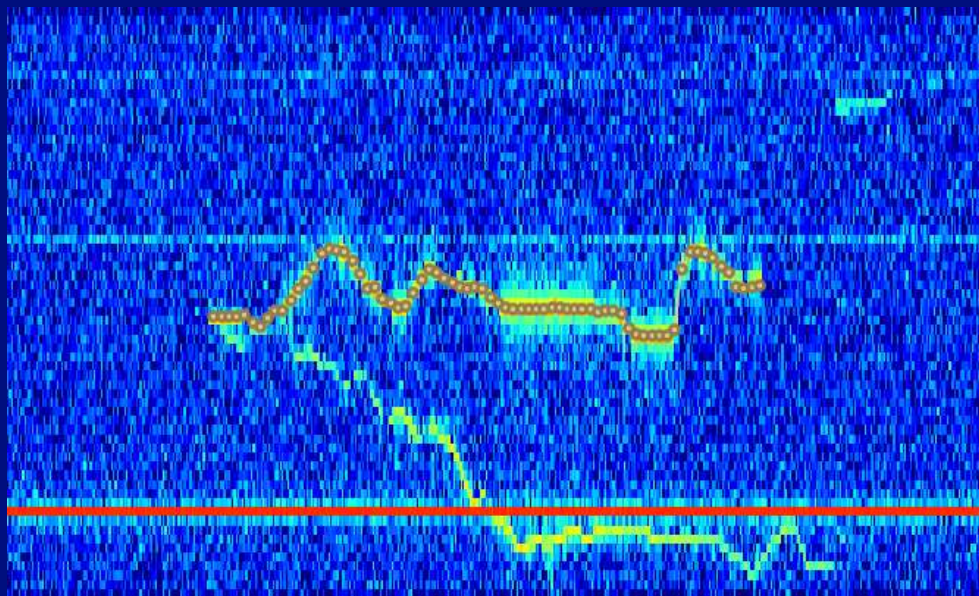


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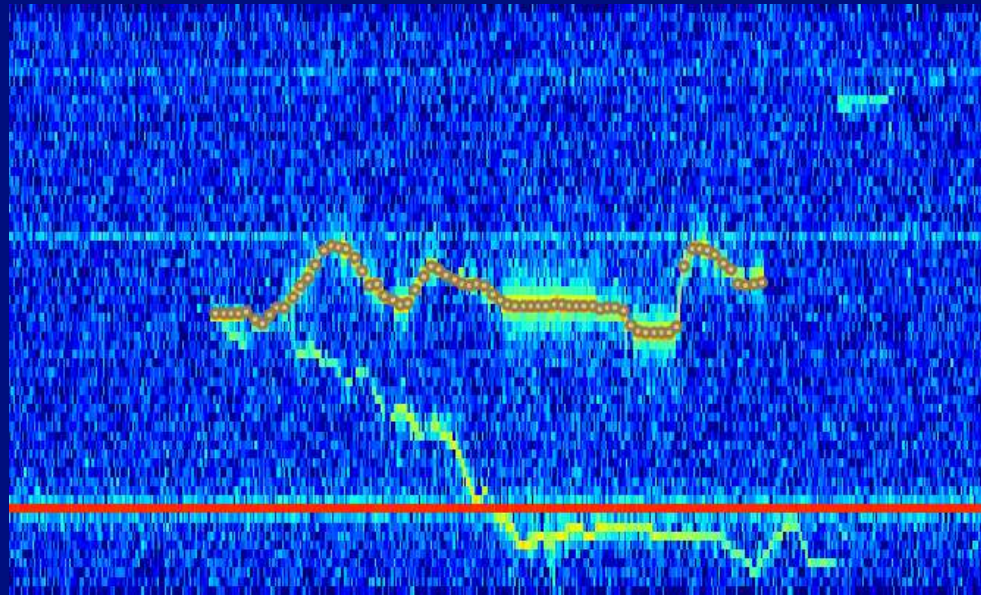
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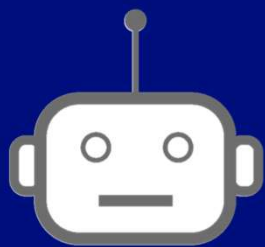


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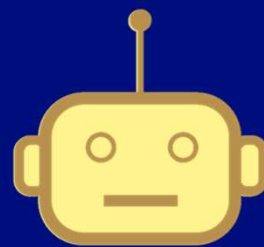


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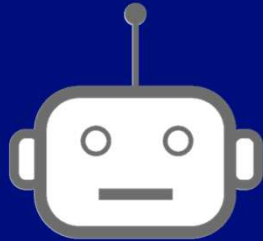




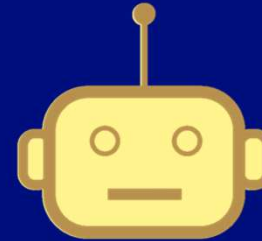
Demucs



CREPE

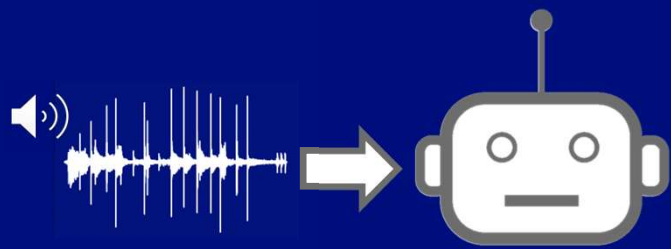


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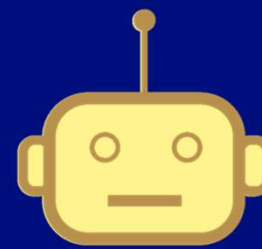


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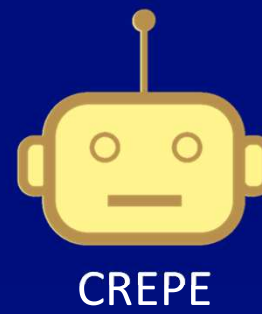
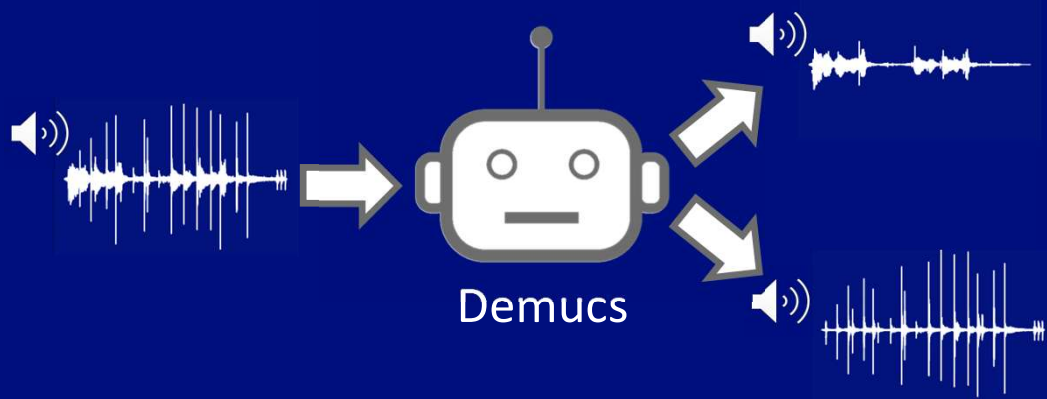
The screenshot shows a Google search interface. The search bar contains the text "What can Demucs do?". Below the search bar, there are navigation tabs: "AI Mode", "All", "Images", "Videos", "Forums", "Shopping", "Short videos", "More", and "Tools". The "All" tab is selected. Below the tabs, there is an "AI Overview" section, indicated by a blue star icon. The text in the AI Overview section reads: "Demucs is a state-of-the-art open-source AI model developed by Meta (Facebook) that separates music into individual audio stems—vocals, drums, bass, and other instruments—with high accuracy. Using an encoder-decoder framework, it analyzes audio waveforms to create high-quality, separate tracks for remixing, sampling, or".

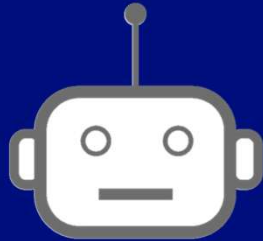


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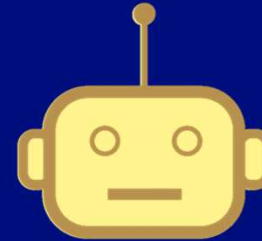


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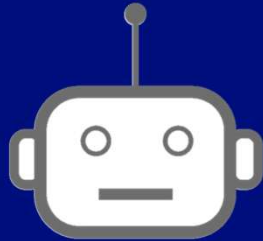


Demucs

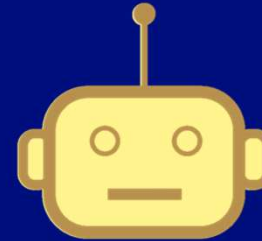


CREPE

The screenshot shows a Google search interface. The search bar contains the text "What can CREPE do?". Below the search bar, navigation tabs include "AI Mode", "All", "Images", "Shopping", "Videos", "Forums", "Short videos", "More", and "Tools". The "All" tab is selected. Below the tabs, an "AI Overview" section is visible, featuring a blue star icon. The text in the AI Overview reads: "Crepes are highly versatile, thin French pancakes that can be filled with sweet ingredients (fruits, chocolate) or savory items (cheese, ham, eggs) for any meal. They can be folded, rolled, or stacked into a multi-layered crepe cake. Crepes are generally". To the right of the text is a small image of a crepe topped with strawberries and blueberries.



Demucs



CREPE



What can the AI called CREPE do?

AI Mode

All

Images

Forums

Videos

Shopping

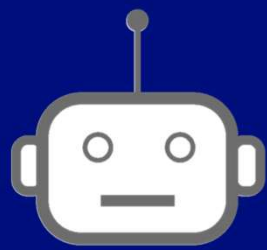
News

More ▾

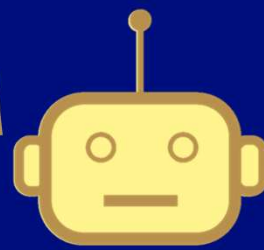
Tools ▾

◆ AI Overview

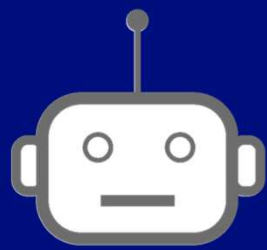
CREPE (Convolutional Representation for Pitch Estimation) is a deep convolutional neural network designed for high-accuracy **pitch tracking (fundamental frequency estimation) of audio signals**. It is considered a state-of-the-art method that outperforms traditional algorithms like pYIN and SWIPE, particularly in noisy



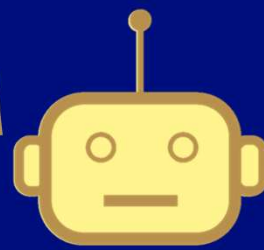
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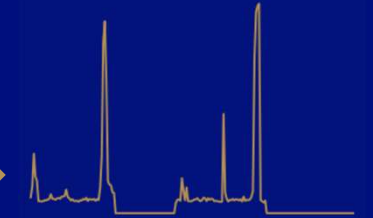
CREPE



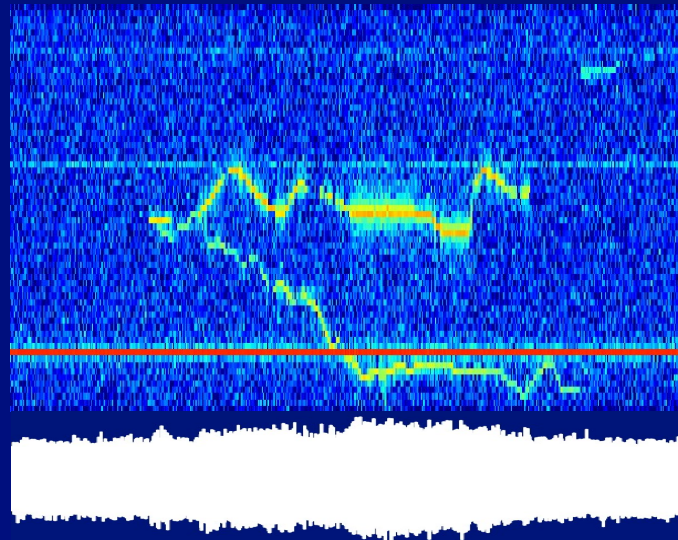
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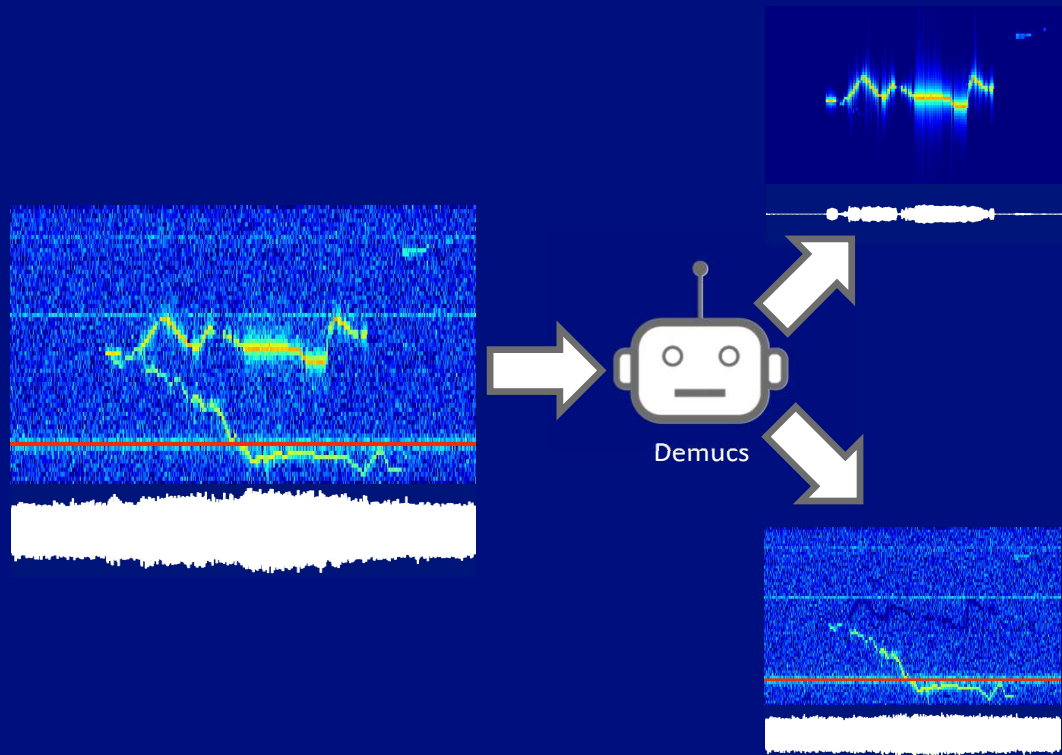


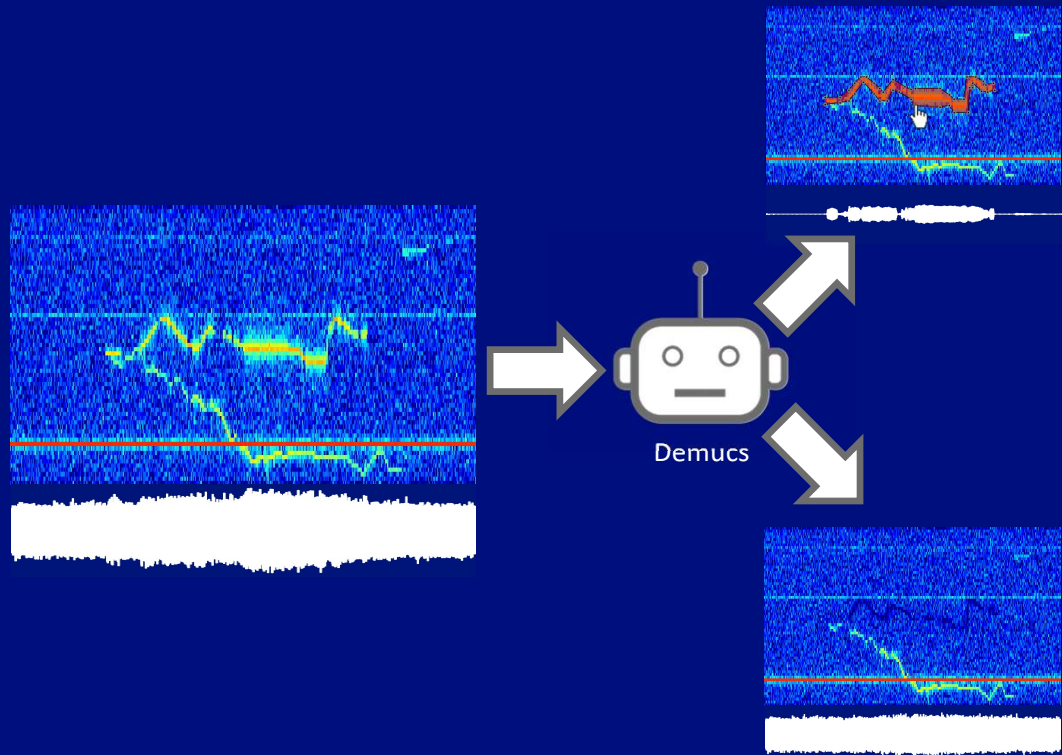
CREPE

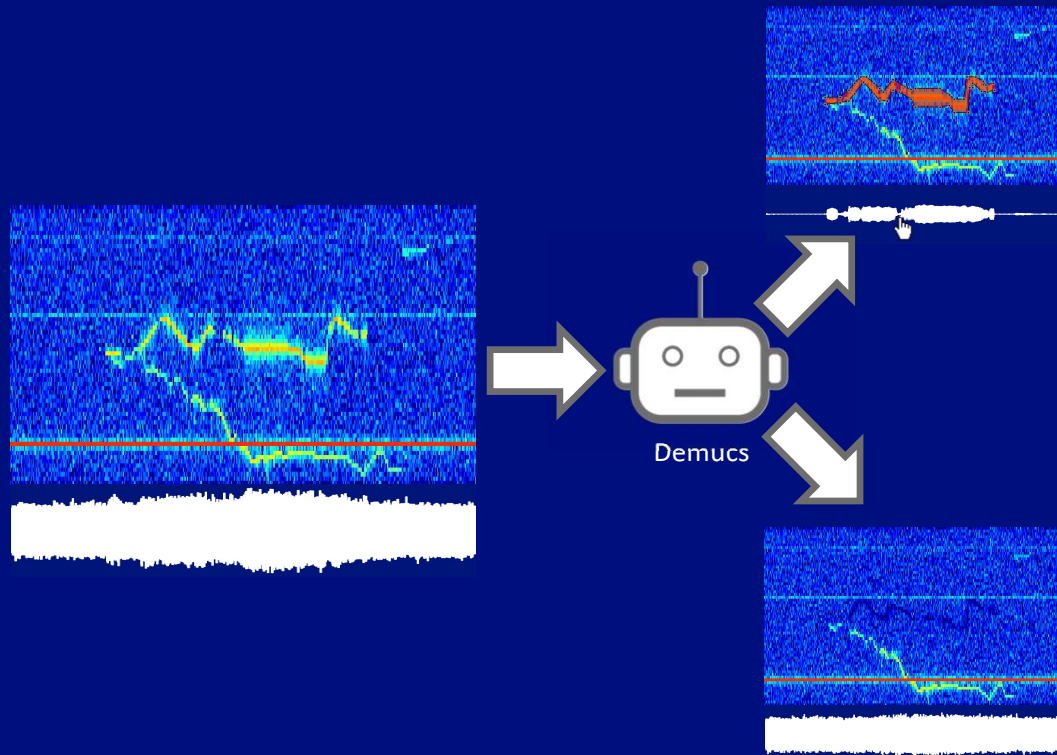


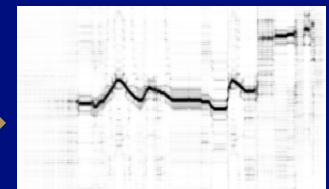
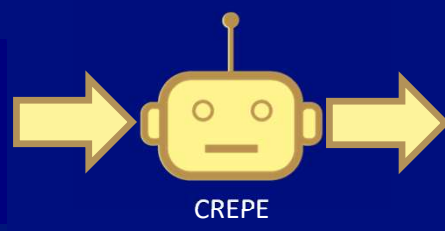
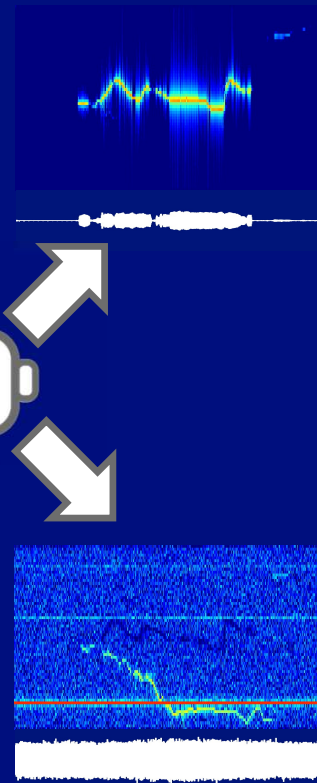
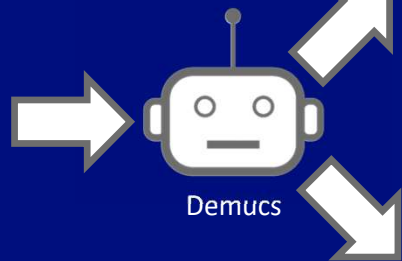
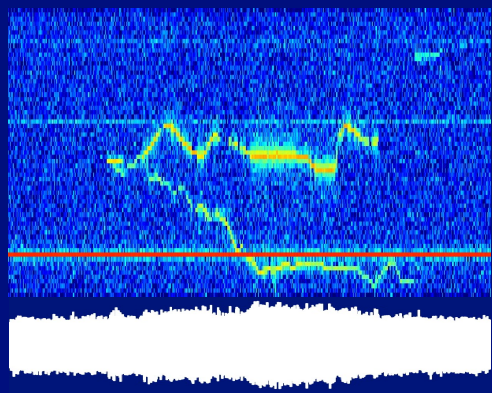


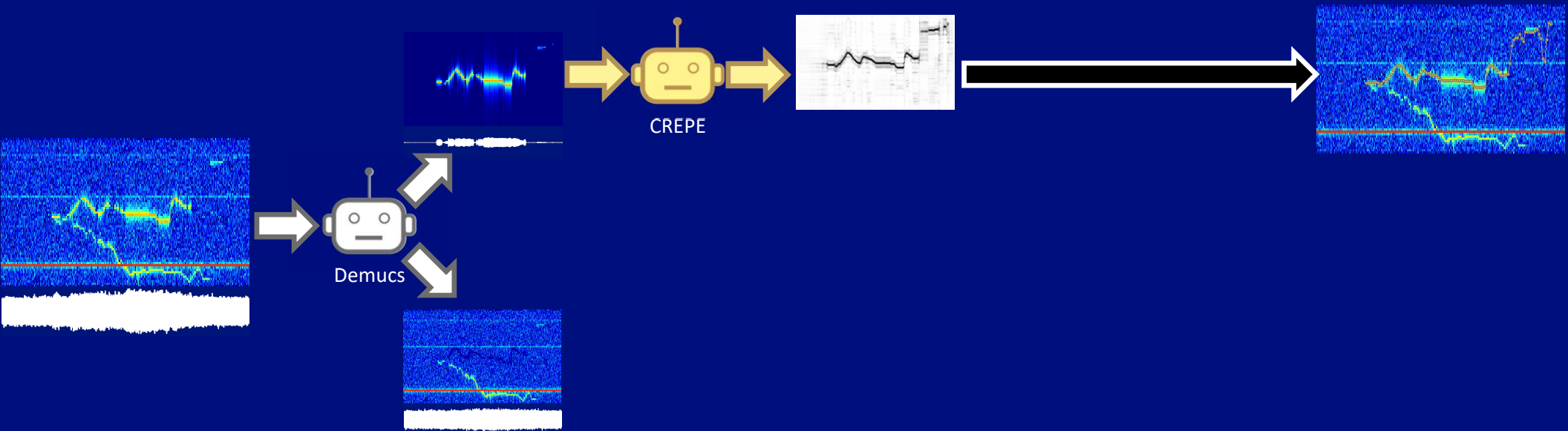


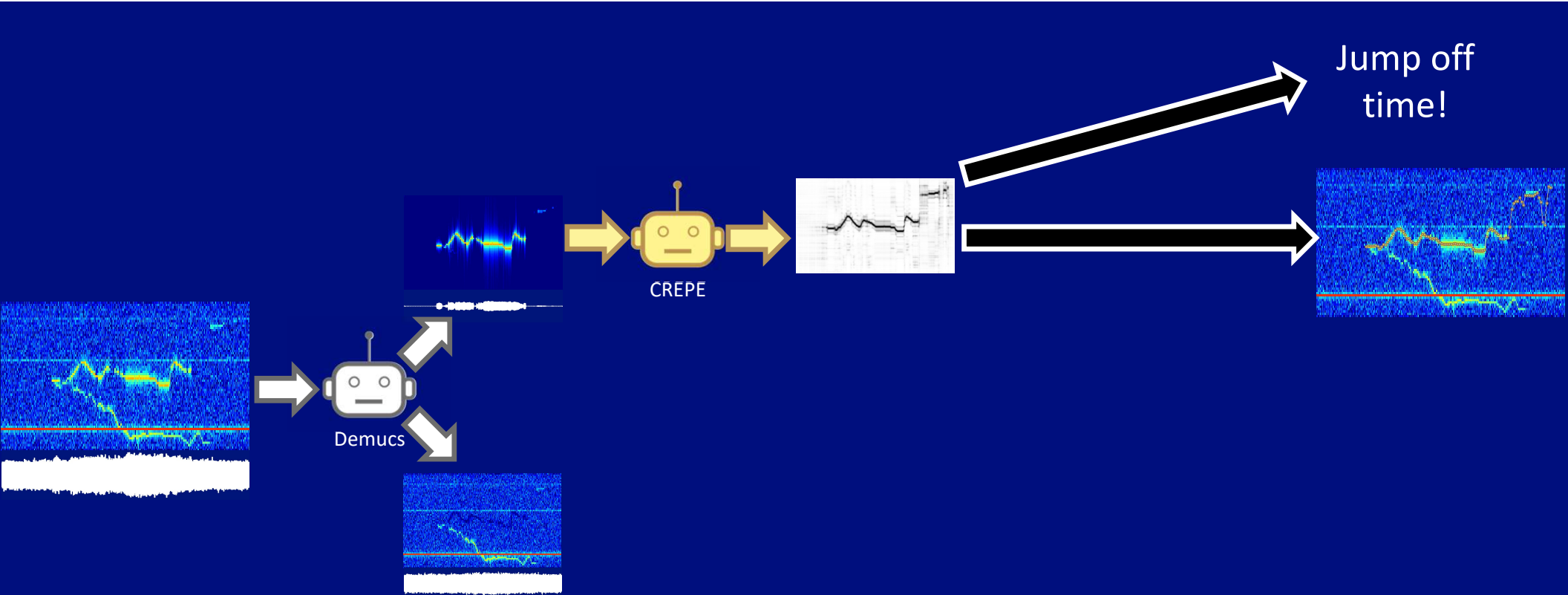


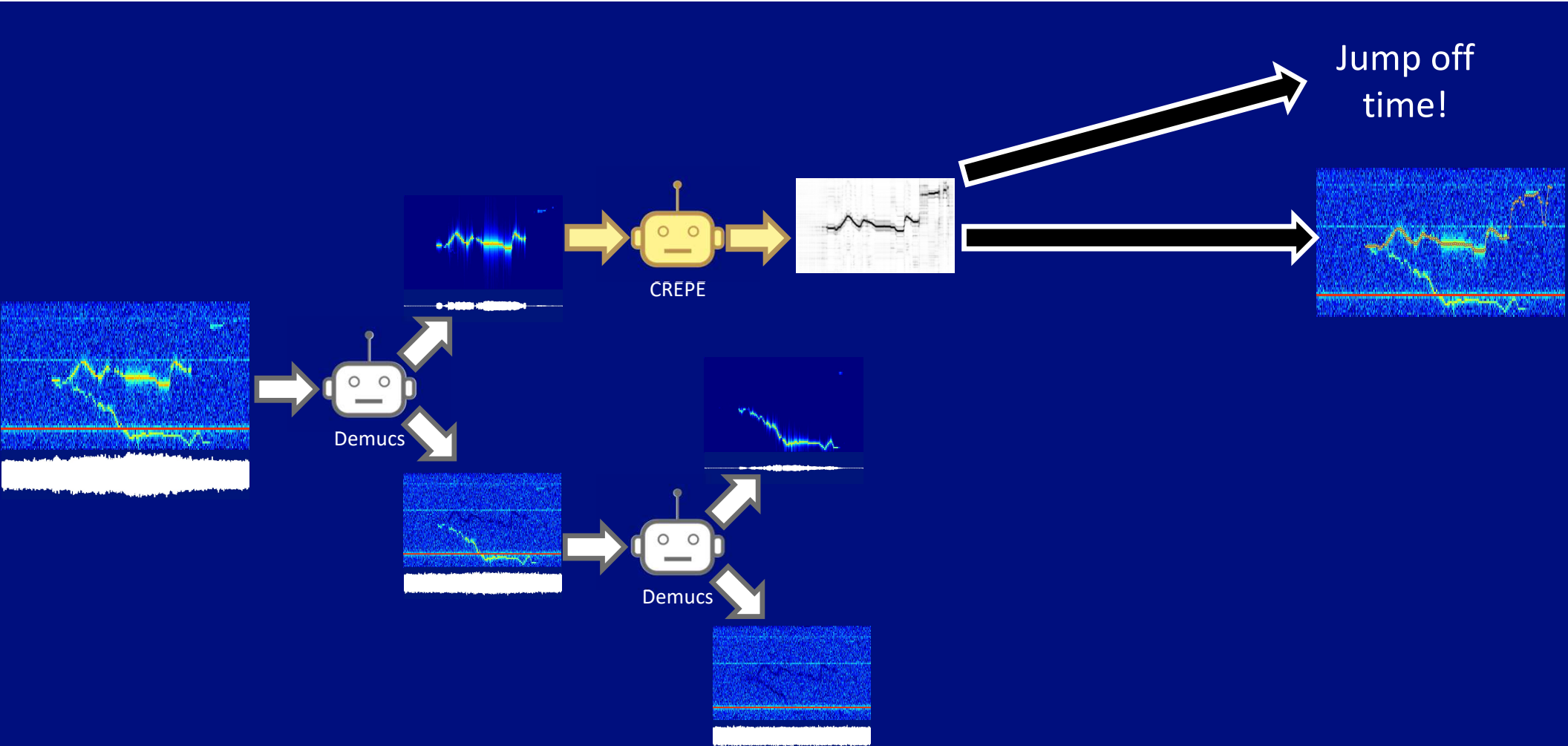


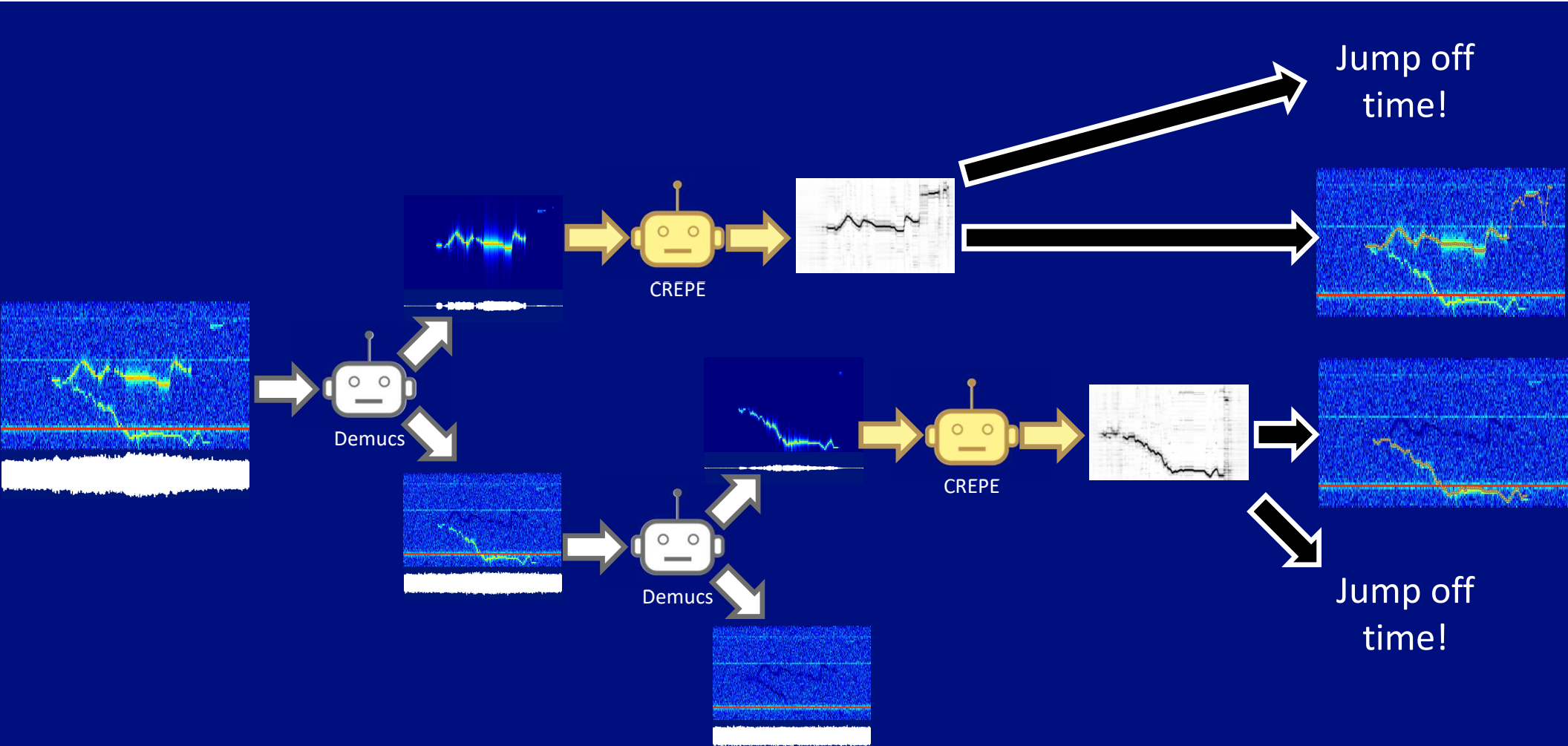




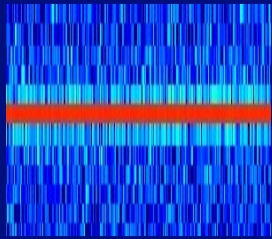




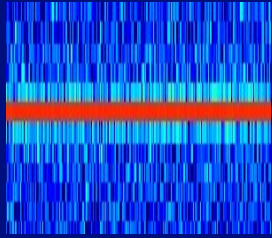




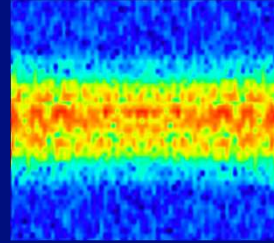




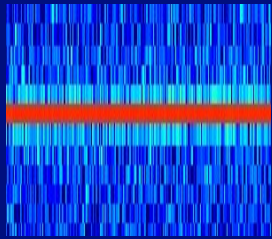
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Baselines



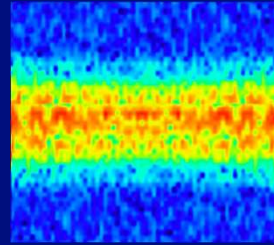
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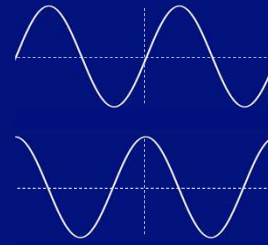
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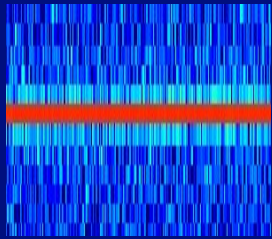
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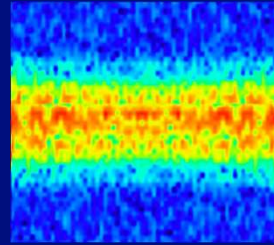
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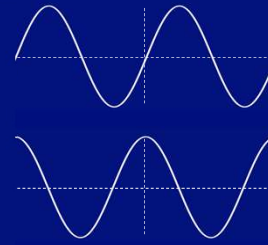
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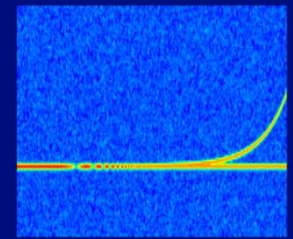
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Baselines



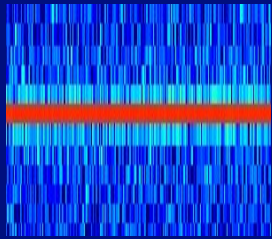
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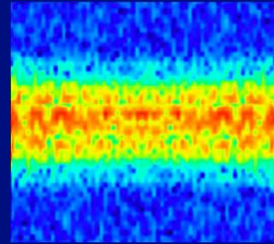
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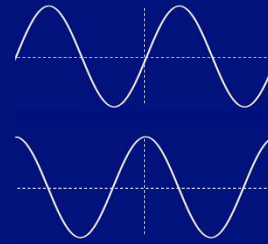
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TIMs



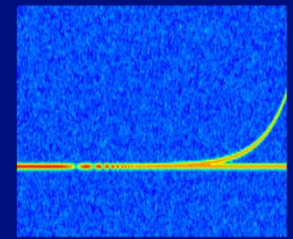
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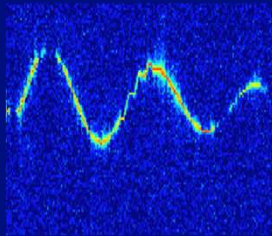
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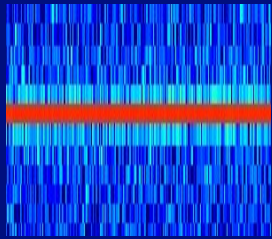
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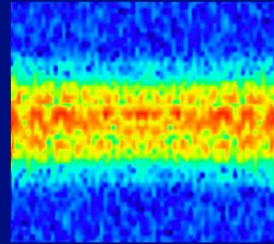
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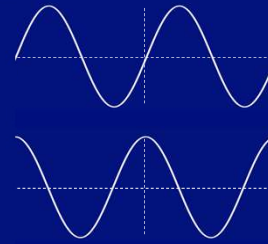
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Analysis



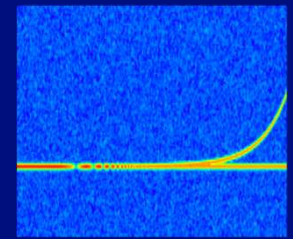
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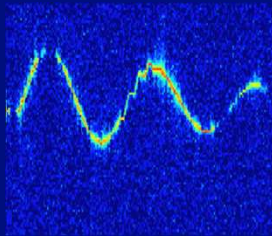
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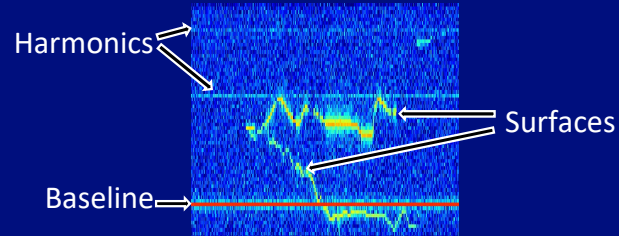
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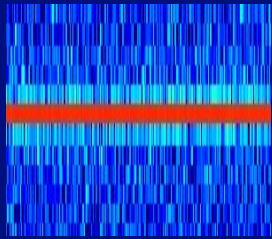
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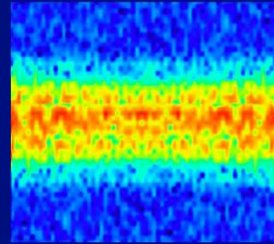
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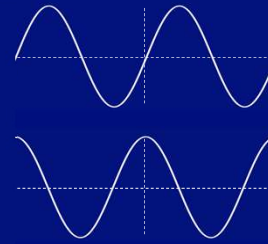
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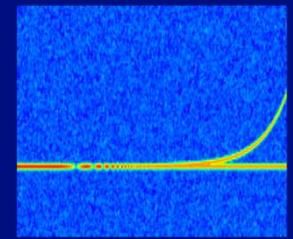
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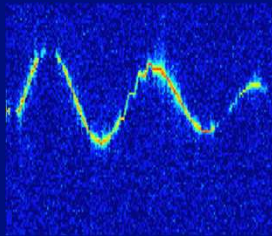
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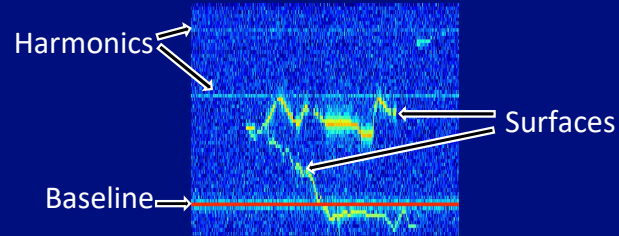
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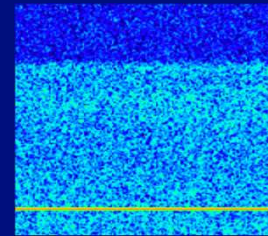
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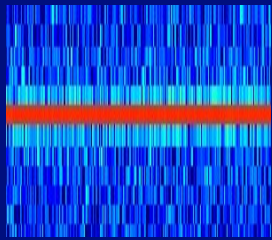
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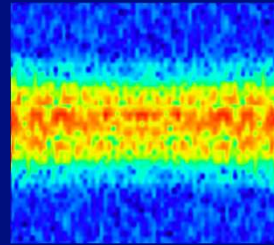
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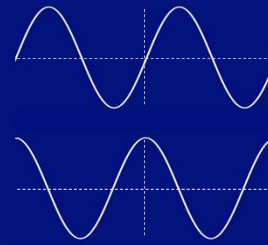
Bandwidth
Mismatch



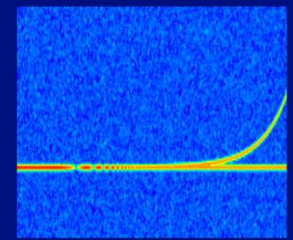
Better
Baselines



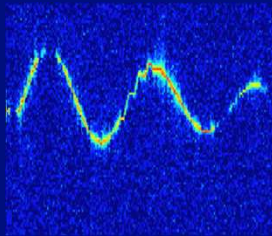
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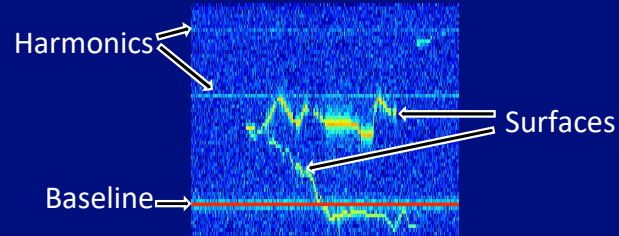
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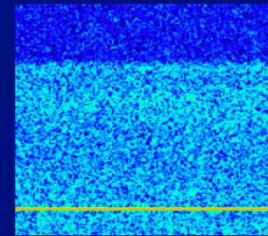
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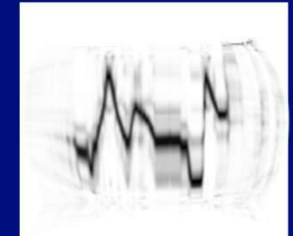
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Analysis



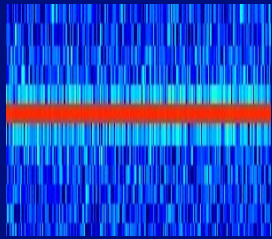
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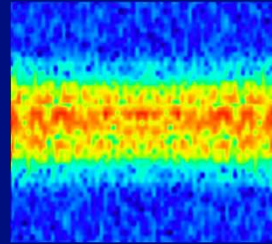
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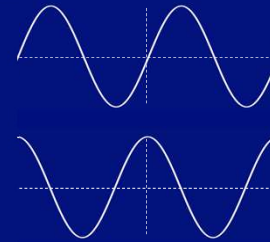
Better
Activation Matrices



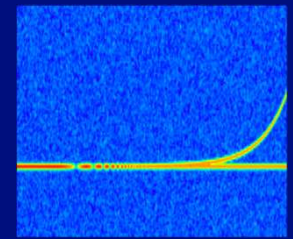
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Baselines



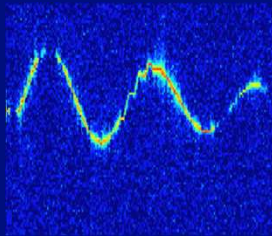
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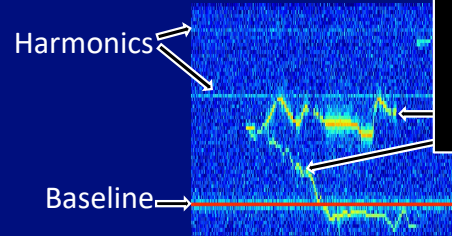
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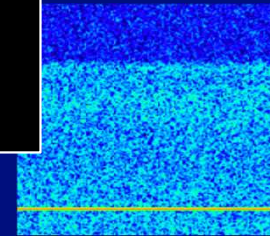
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TIMs



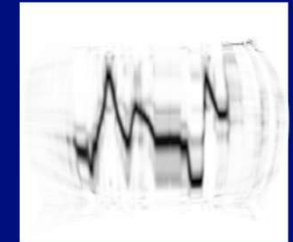
Spall
Analysis



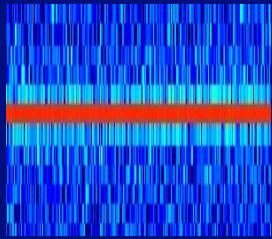
Categorization



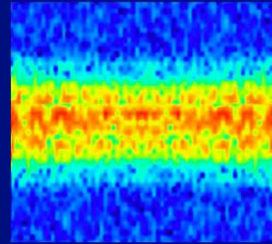
Bandwidth
Mismatch



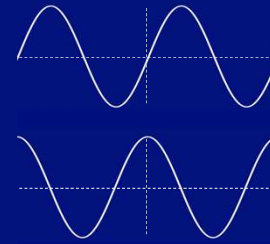
Better
Activation Matrices



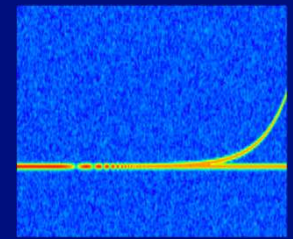
Better
Baselines



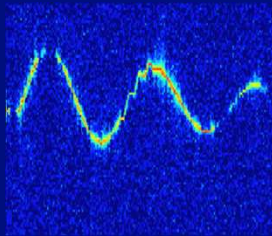
Ejecta



Phase



Ambiguous
TIMs



Spall
Analysis

Journal of Dynamic Behavior of Materials
<https://doi.org/10.1007/s40870-026-00510-3>

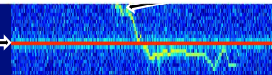
RESEARCH PAPER

Check for updates

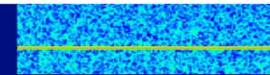
Velocity Extraction Using Complete Time-Domain Waveform Data and Audio Machine Learning

A. Susser¹ · A. Albert¹ · J. Danielson¹ · G. Saavedra¹

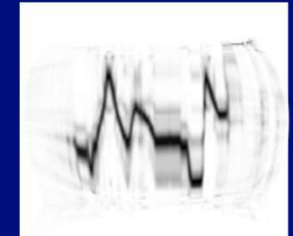
Baseline →



Categorization



Bandwidth
Mismatch



Better
Activation Matrices