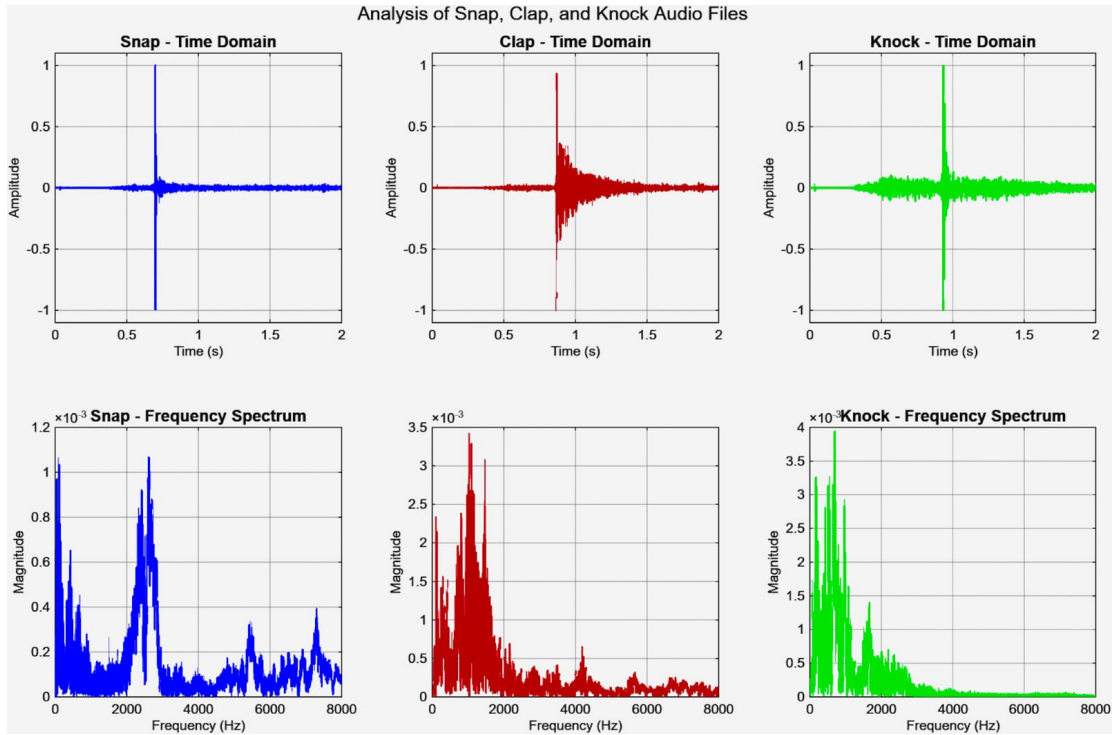
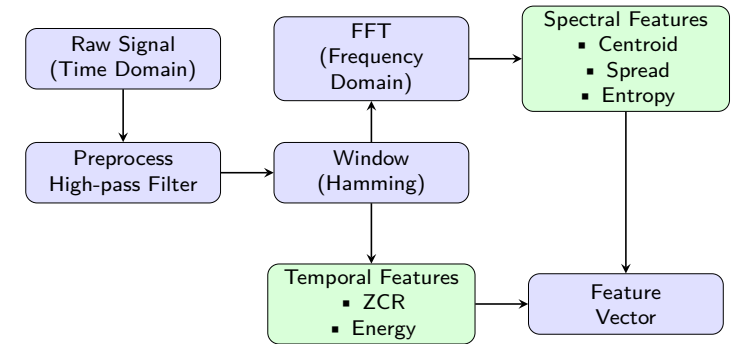


## TIME & FREQUENCY DOMAIN ANALYSIS



## FEATURE EXTRACTION PIPELINE



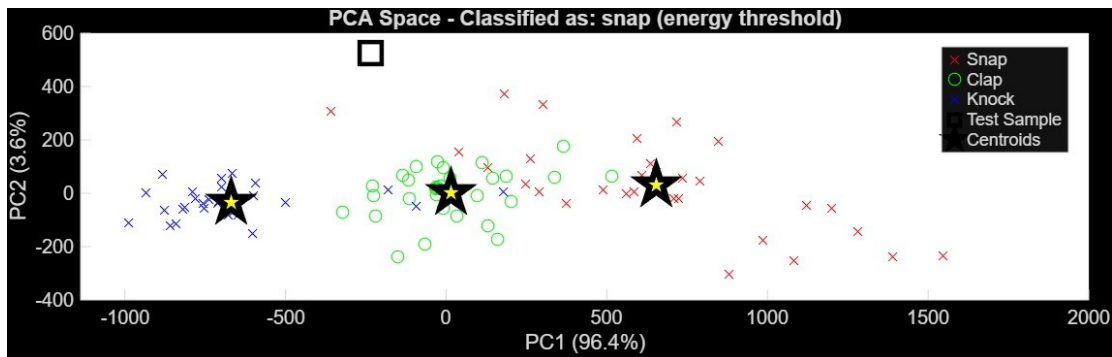
### Processing Steps:

- Raw audio signal preprocessing and windowing
- Parallel extraction of temporal and spectral features
- Feature vector construction for classification

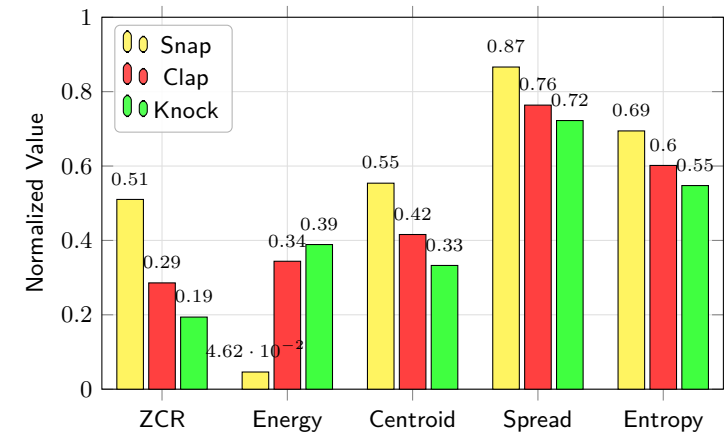
### Classification Logic:

- Energy threshold separates Snap sounds
- Centroid distance classifies Clap vs Knock

## SPECTRAL CENTROID ANALYSIS



## FEATURE COMPARISON & ANALYSIS



**Snap:** High ZCR(0.51), centroid (0.55), low energy (0.05) || **Clap:** Moderate values across all features || **Knock:** High energy(0.39), low ZCR(0.19)