

OUTPUT

Database

**ML TRANSLATION ALGORITHM**

***Pre-processing***

*(Tokenization and normalization)*

**↓**

**Encode & Decode**

**↓**

**Postprocessing**

*(Detokenization and normalization)*

**↓**

**Translation Model**

*(MarianMT Model)*

**↓**

**English Translation Result**

**ASR ALGORITHM**

***Signal Pre-processing***

*(Noise Reduction | Pre-emphasis | Framing | Windowing | VAD | Normalization)*

**↓**

**Feature Extraction**

*(MFCC)*

**↓**

**Acoustic Model**

*(Gaussian Mixture Model)*

**↓**

**Language Model**

*(Wav2Vec2 Model)*

**↓**

**Arabic Text Result**

**ARAVoE**: Arabic Recognition Assisted Vocabulary of English: A Voice-Driven Cross-Language Dictionary



**OUTPUT**

**SPEECH**

**SIGNAL PREPROCESSING**

• Noise Reduction

• Pre-emphasis

• Framing

• Windowing

• Voice Activity Detection

• Normalization

**Speech Classification (Acoustic Model)**

Gaussian Mixture Models (GMM)

**Decoding**

**(Language Model)**

Transformer Models:

Wav2Vec2 model

**FEATURE EXTRACTION**

Mel-Frequency Cepstral Coefficients (MFCC)