الجمهورية الشعبية الديمقراطية الجزائرية
People's Democratic Republic of Algeria
وزارة التعليم العالي و البحث العلمي
Ministry of Higher Education and Scientific Research
المدرسة العليا للإعلام الآلي 8 ماي 1945 - سيدي بلعباس
Higher School of Computer Science
8 Mai 1945 - Sidi Bel Abbes

Graduation Thesis

To obtain the diploma of **Master Degree**

Field of Study: **Computer Science**

Specialization: **Artificial Intelligence and Data Science**

Theme

Development of a Speech-to-Text (STT) System for the Breton Language

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Presented by
Zemouri Ouassim

Defended on: October, 2025

Abstract

This thesis explores Automatic Speech Recognition (ASR) for Breton, a low-resource language with significant dialectal variation. We evaluate several ASR models including OpenAI's Whisper models, focusing on Whisper-Large, across two datasets: Mozilla Common Voice 21 and La Banque Sonore des Dialectes Bretons (BSDB). Experiments were conducted with and without text cleaning, using Word Error Rate (WER) and Character Error Rate (CER) as evaluation metrics.

Due to resource limitations, full fine-tuning of Whisper proved challenging, leading to the use of Parameter-Efficient Fine-Tuning (PEFT) methods such as LoRA. A fine-tuned Whisper-Small model was produced, demonstrating the effectiveness of PEFT for under-resourced languages.

This work underlines the potential of modern ASR models and efficient adaptation techniques to improve speech recognition for Breton language and offers insights applicable to other low-resource languages.

Keywords— Deep Learning, Automatic Speech Recognition, Breton language, Model Evaluation, Low-resource languages, Data cleaning