

Internship Offer – Master 2 or Engineering Level

AI-Based Prediction of Speech Trajectories in Friedreich's Ataxia

Dates: From Spring 2026, 6 months

Location: Sorbonne Université, ISIR

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Summary

Friedreich's ataxia (FA) is a rare hereditary neurodegenerative disease that progressively affects motor coordination, balance, and speech. While gait and motor function have been extensively studied, **the longitudinal evolution of speech impairments in FA remains poorly characterized**, despite their major impact on communication and quality of life.

With the emergence of new treatments such as omaveloxolone—recently approved in the US and Europe—there is a growing need to identify sensitive speech-based markers capable of capturing disease progression and treatment response. **Voice, acoustic, prosodic, and linguistic features offer promising candidates, but require robust modeling approaches to understand how they evolve over time.**

This internship is part of the EVOLU-VOX project, which aims to model 18-month speech trajectories in 102 patients (French + German cohorts). **The goal is to leverage machine learning to identify progression profiles and predict clinical evolution from speech features.**

This internship is conducted within a collaboration between the Paris Brain Institute (ICM) and the Institute for Intelligent Systems and Robotics.

Objectives

1. **Speech Feature Modeling:** Extract and structure acoustic, prosodic, and linguistic descriptors from longitudinal recordings (e.g., spectral features, rhythm, pauses, disfluencies).
2. **Identification of Progression Profiles:** Use clustering and trajectory analysis to identify subgroups of patients exhibiting distinct speech evolution patterns over 18 months.
3. **Prediction of Clinical Evolution:** Develop predictive models that infer clinical progression from speech features, and compare speech-based vs. clinical-only prediction performance.