

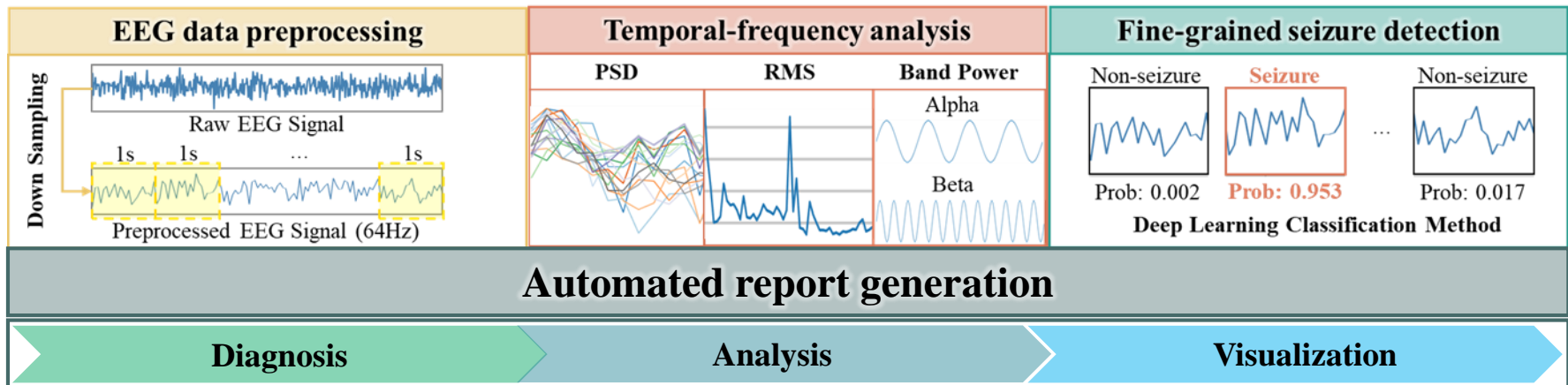
EpiSight: An Intelligent EEG Automated Analysis Platform for Clinical Epilepsy Diagnosis

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Problems & Ideas

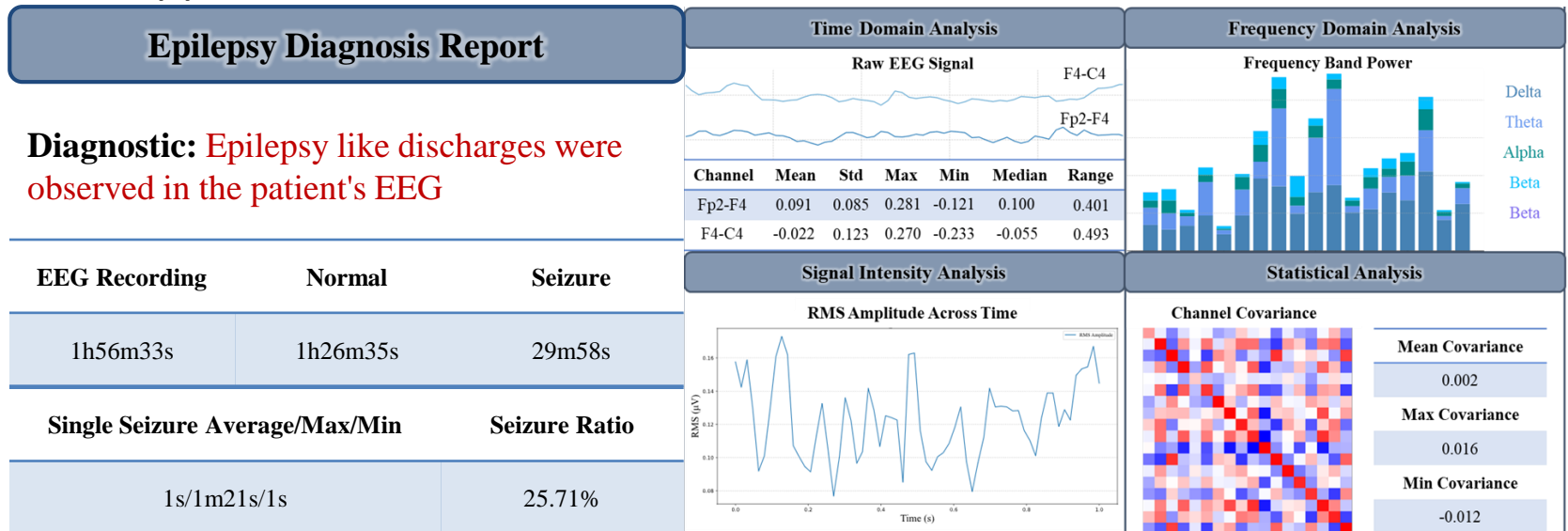
- Problems of EEG based epilepsy diagnosis methods:
 - High Subjectivity and Workload in Manual EEG Interpretation, Prone to Missed or Misdiagnosis.
 - Limited Temporal Resolution and Quantitative Analysis in Existing Automated Tools.
- Ideas: An automated EEG epilepsy diagnosis platform that integrates time-frequency analysis and deep learning-based seizure detection.



The workflow of the automated EEG epilepsy diagnosis platform, which consists of three main processes: EEG data preprocessing, temporal-frequency analysis, and fine-grained seizure detection. The platform integrates these modules to enable end-to-end analysis, culminating in the generation of a standardized diagnostic report that supports clinical diagnosis, quantitative analysis, and intuitive visualization of epileptic events.

Main Contributions

- Contributions:
 - Fine-grained seizure detection: Second-by-second classification of EEG signals, achieving high-resolution seizure burden quantification;
 - Analysis of seizure segments: Automatic identification and detailed analysis of the segment most representative of seizure activity, delivering interpretable visual outputs;
 - Automated clinical report generation: Delivers user-friendly outputs and generates standardized summary reports, designed to seamlessly support clinical workflows and documentation.



A sample of epilepsy diagnosis report generated by the automated platform, which highlights detected epilepsy-like discharges and presents key results such as seizure duration, supporting efficient and standardized clinical assessment.