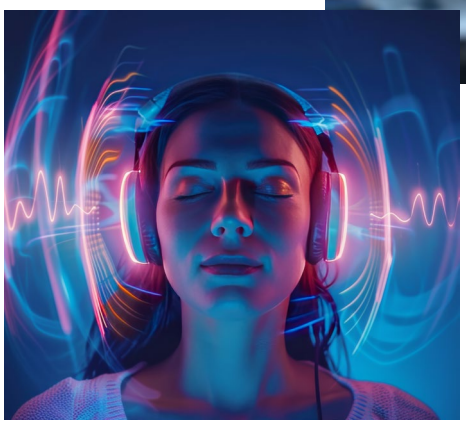
Epilepsy related diagnostics and Treatment

MedTech & Digital Health

Diagnostics

Reference Number: **2481** \ Principal Investigator: **Prof. Michal Ramot** \ Patent Status: **Drafted**

Epilepsy affects ~50 million people worldwide, with 30% suffering from drug-resistant epilepsy (DRE) that drives persistent seizures, high mortality, and frequent misdiagnosis. Current EEG-based diagnostics are expert-dependent, slow, and inconsistent. This technology applies unsupervised machine learning to automatically detect interictal epileptiform discharges (IEDs) and patient-specific network markers highly correlated with clinical outcomes. Automated, AI-driven EEG analysis enables accurate, efficient, and scalable diagnostic workflows.



APPLICATIONS

- Improved accuracy and consistency of epilepsy diagnosis
- Personalized network-level biomarker-guided monitoring of treatment response and disease progression
- Support for pre-surgical evaluation in drug-resistant epilepsy
- Scalable large-scale EEG analysis for clinical and research settings for novel insights for clinicians
- Potential future real-time prediction of incoming seizure using the personalized network level biomarkers, allowing preventive actions

DEVELOPMENT STAGE

- A prototype ML algorithm was implemented and benchmarked against neurologist annotations, achieving high recall and detecting significantly more events than experts.
- Initial correlations with clinical markers were demonstrated.
- Next steps include extensive validation across larger patient datasets and development of full epileptiform network detection models in collaboration with Rabin Medical Center.

DIFFERENTIATION

Unsupervised AI: Reduces expert bias & manual workload while improving accuracy

Scalable: Enables efficient, high-throughput EEG analysis

Personalized markers: Provides individualized measures linked to clinical outcomes