

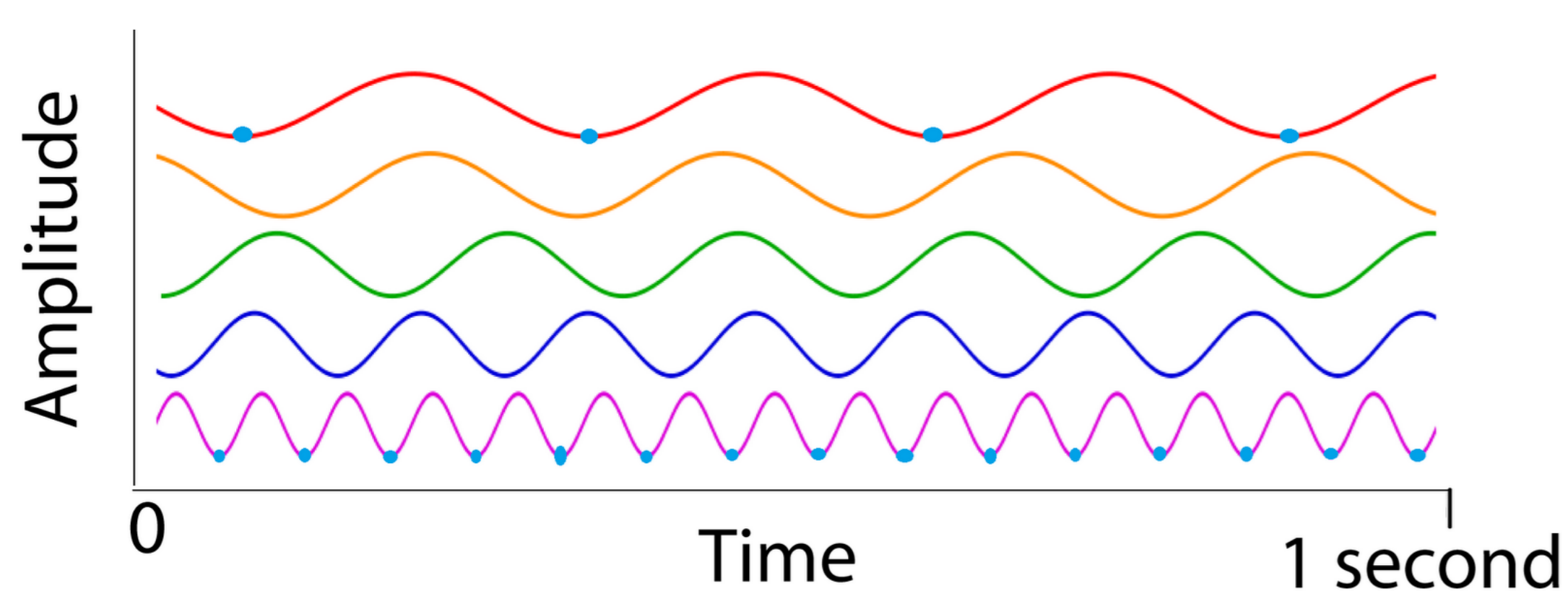
A case study demonstrating the pitfalls during evaluation of a predictive seizure detector

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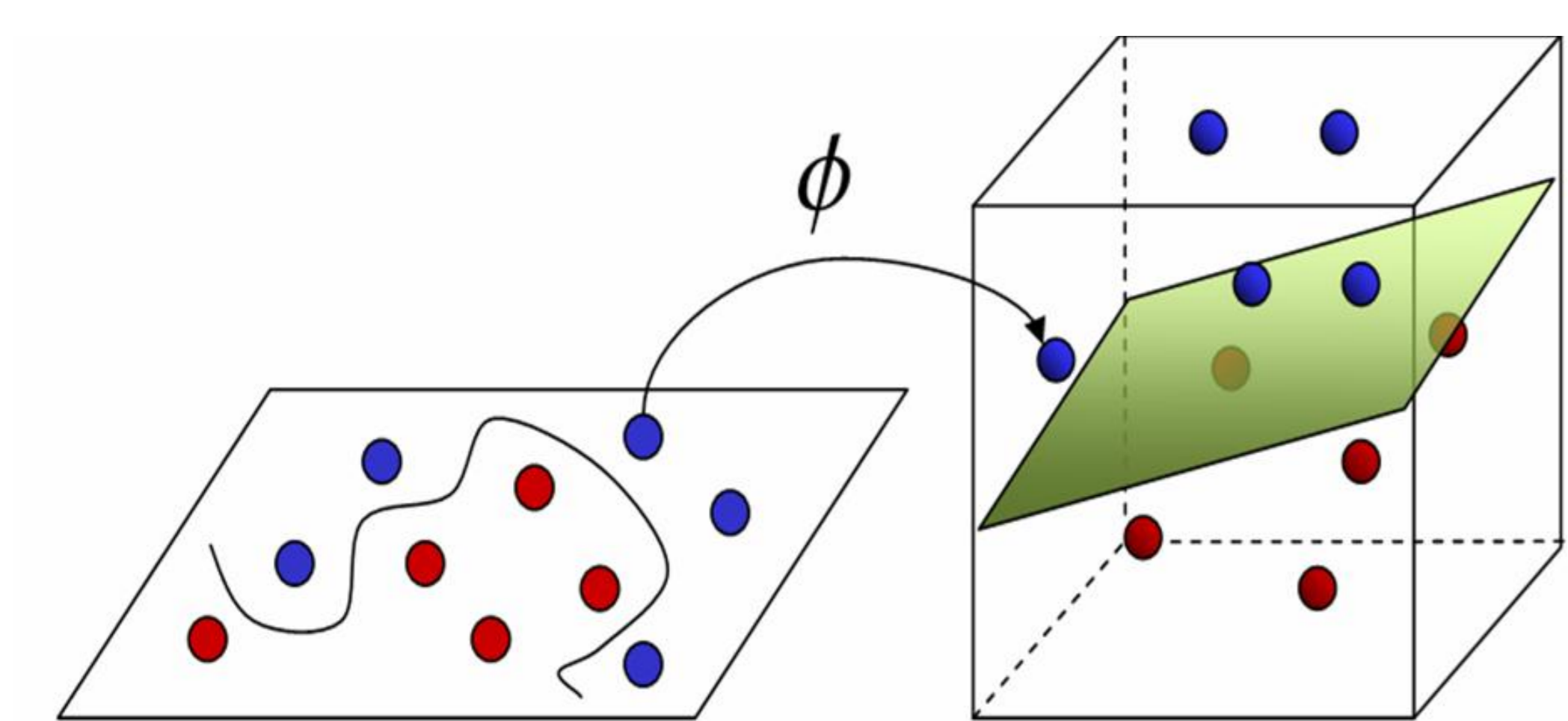
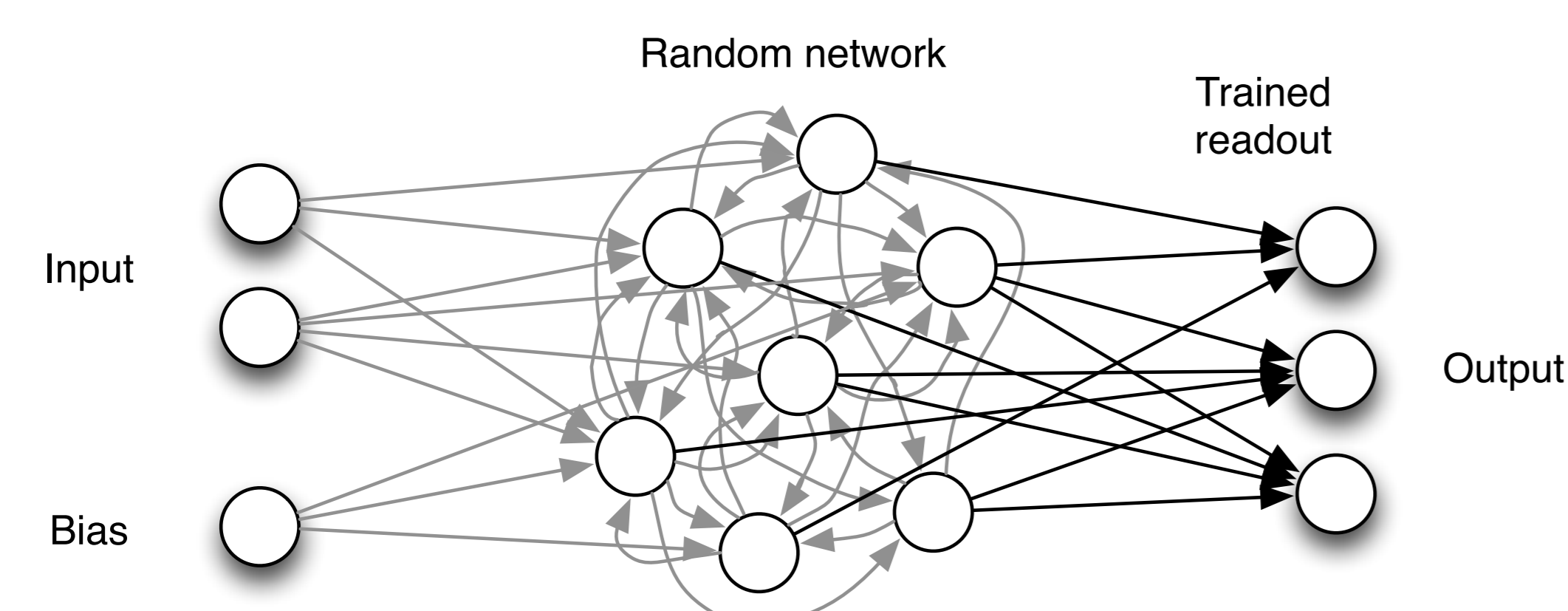
Introduction

Epilepsy is a neurological disorder characterized by recurring epileptic seizures that can occur at any given time. A system predicting these seizures could give a patient sufficient time to bring himself to safety and to apply a fast-working anti-epileptic treatment to suppress the upcoming seizure. Many seizure detection techniques claim to be able to detect seizures before the marked seizure onset on the EEG. In this work we study the predictions of such a seizure detection system.

Pre-processing



Reservoir Computing



Methods

Several seizure detectors are compared:

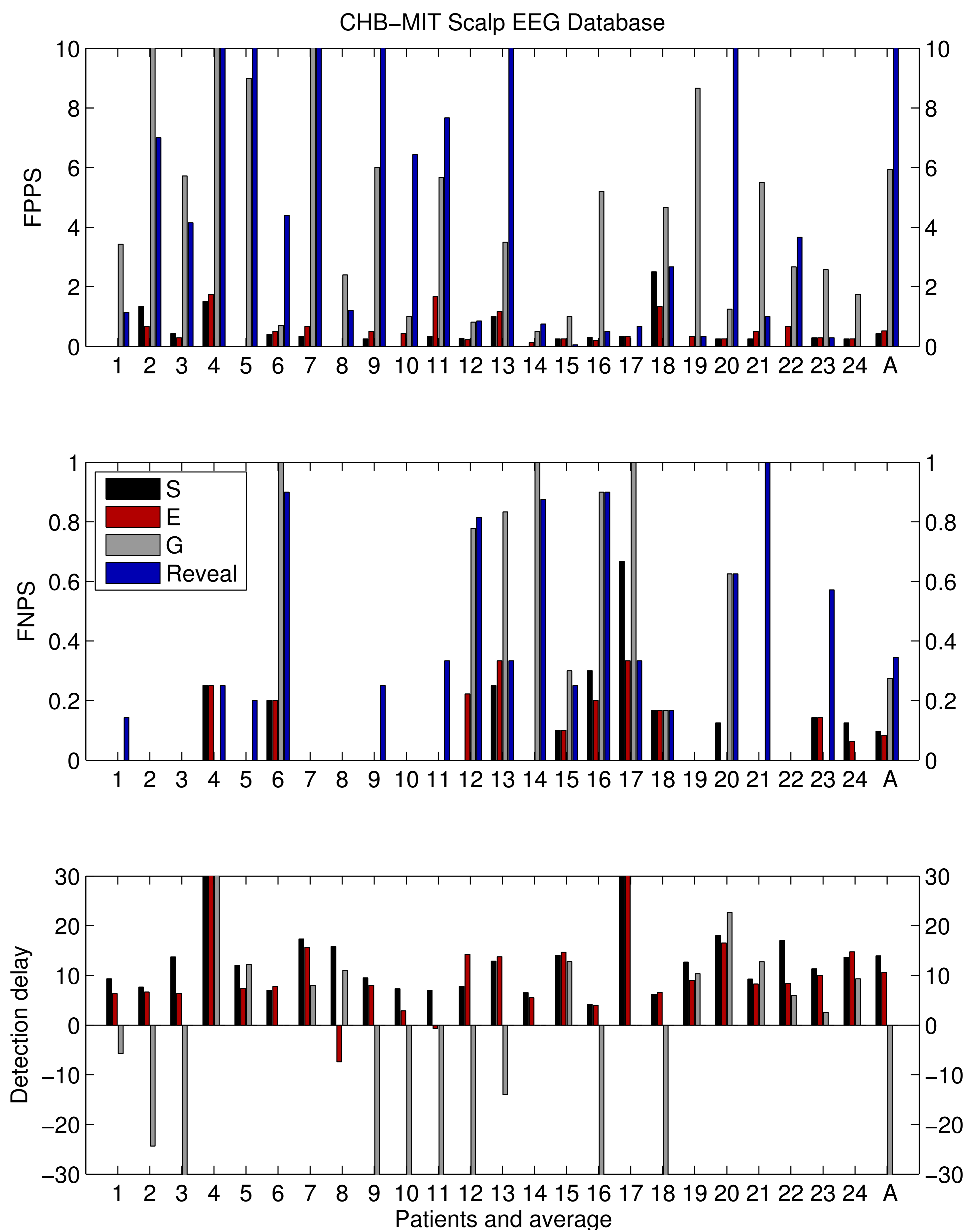
- S: Patient-specific seizure detector
- E: Patient-specific early seizure detector
- G: General early seizure detector
- Reveal: The algorithm used by Persyst

To train the early seizure detectors the EEG of 10 minutes before and after a seizure is ignored during training.

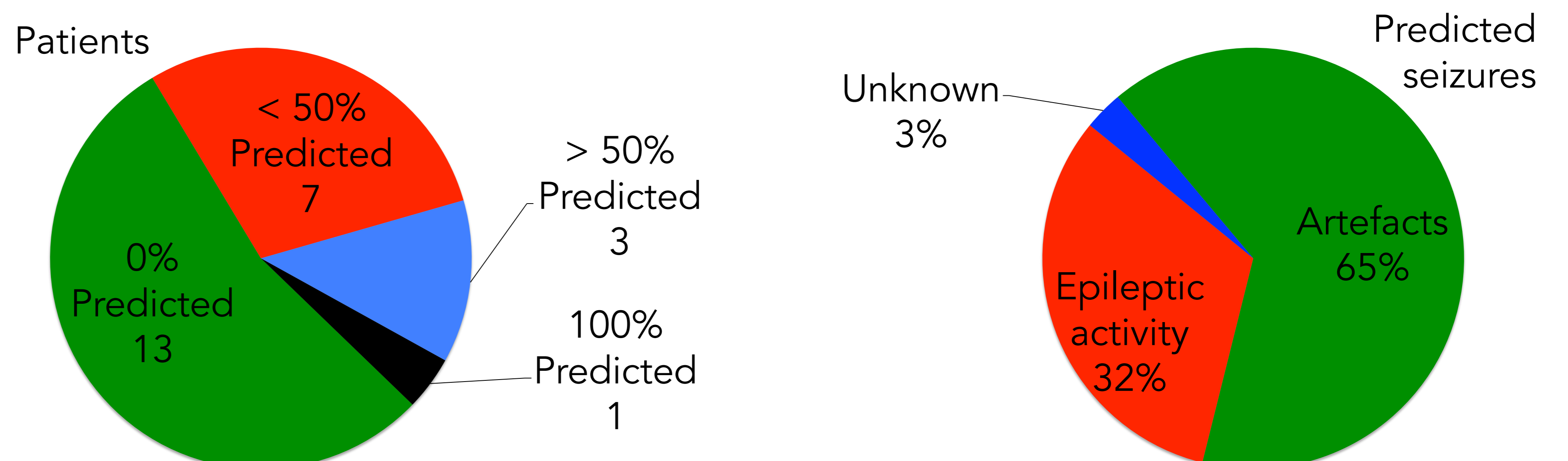
Error Measures

FPPS : False positives per seizure in the dataset
FNPS : False negatives per seizure in the dataset
Delay : Time required to detect a seizure

Experiments & Results



General Early Seizure Detector



Conclusion

These pitfalls call for common guidelines and datasets to evaluate early seizure detection methods.