

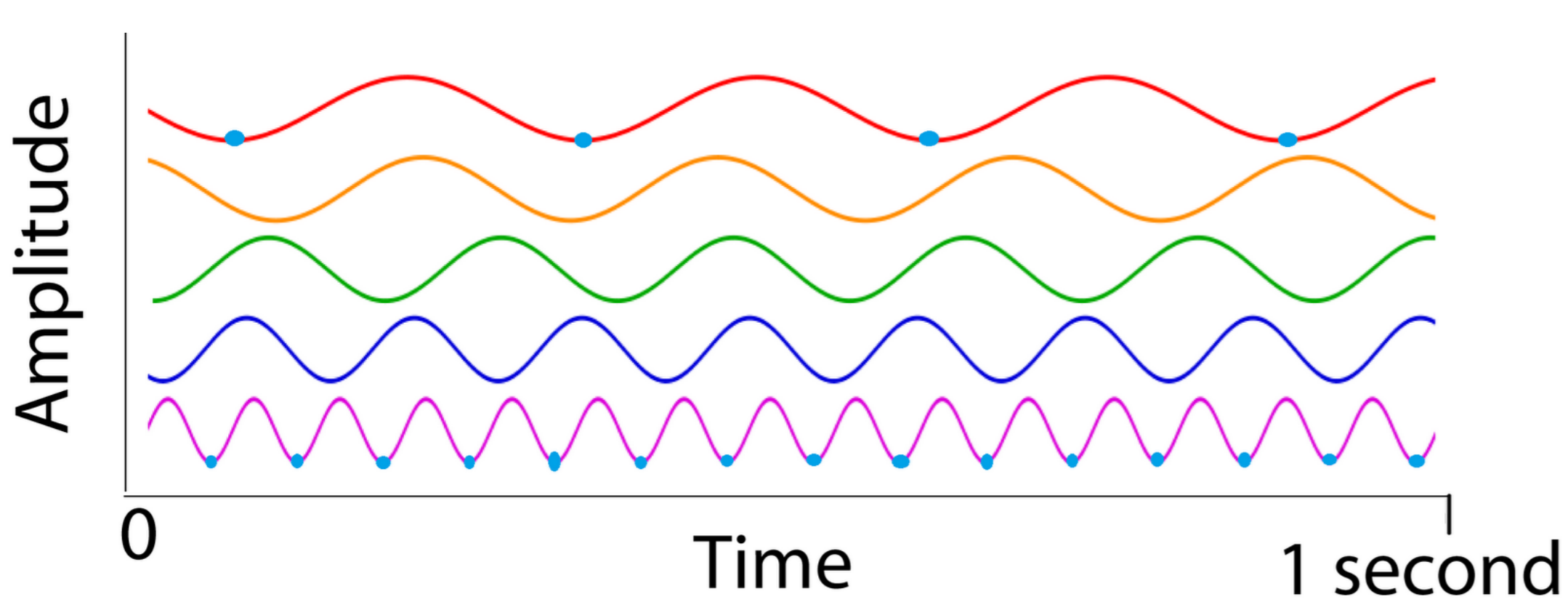
Building a patient-specific seizure detector without expert input using user-triggered active learning strategies

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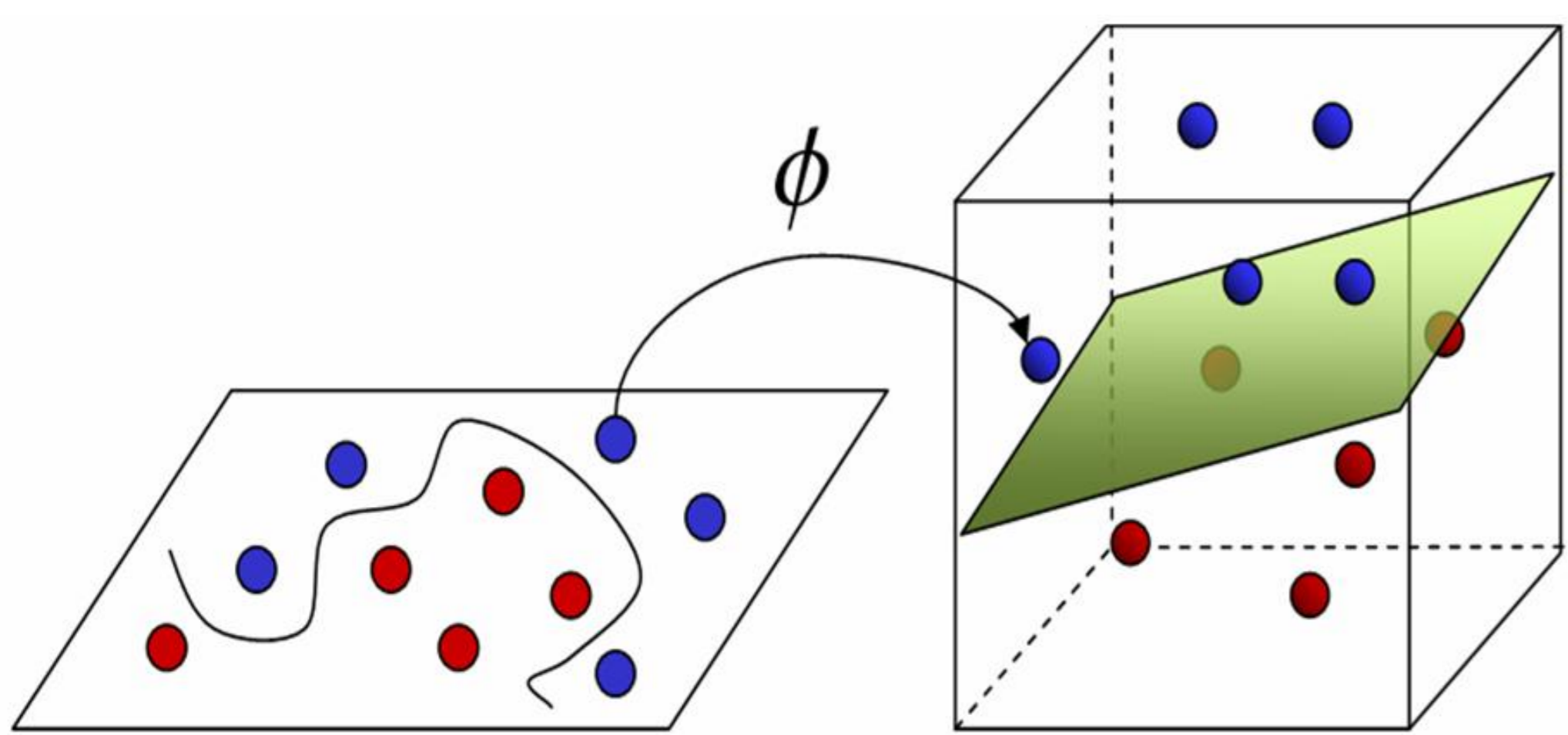
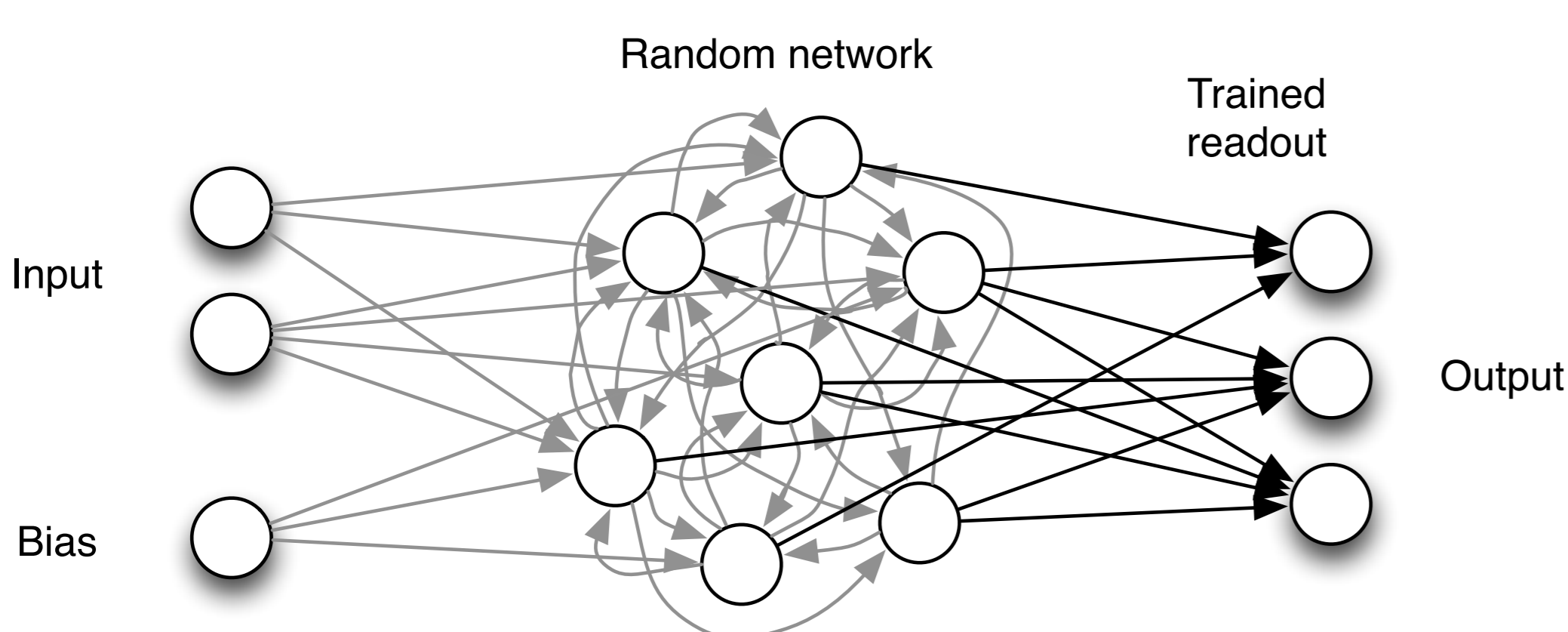
Introduction

Seizure detectors have been developed as a warning system for caregivers and to apply online treatment. Patient-specific seizure detectors perform better than general seizure detectors. However, building patient-specific seizure detectors requires costly video-EEG monitoring and EEG expert time.

Pre-processing



Reservoir Computing



Active Learning

First a general seizure detector is built (G) on all patients except 1. Next, user-triggered active learning strategies are applied on the data of the omitted patient:

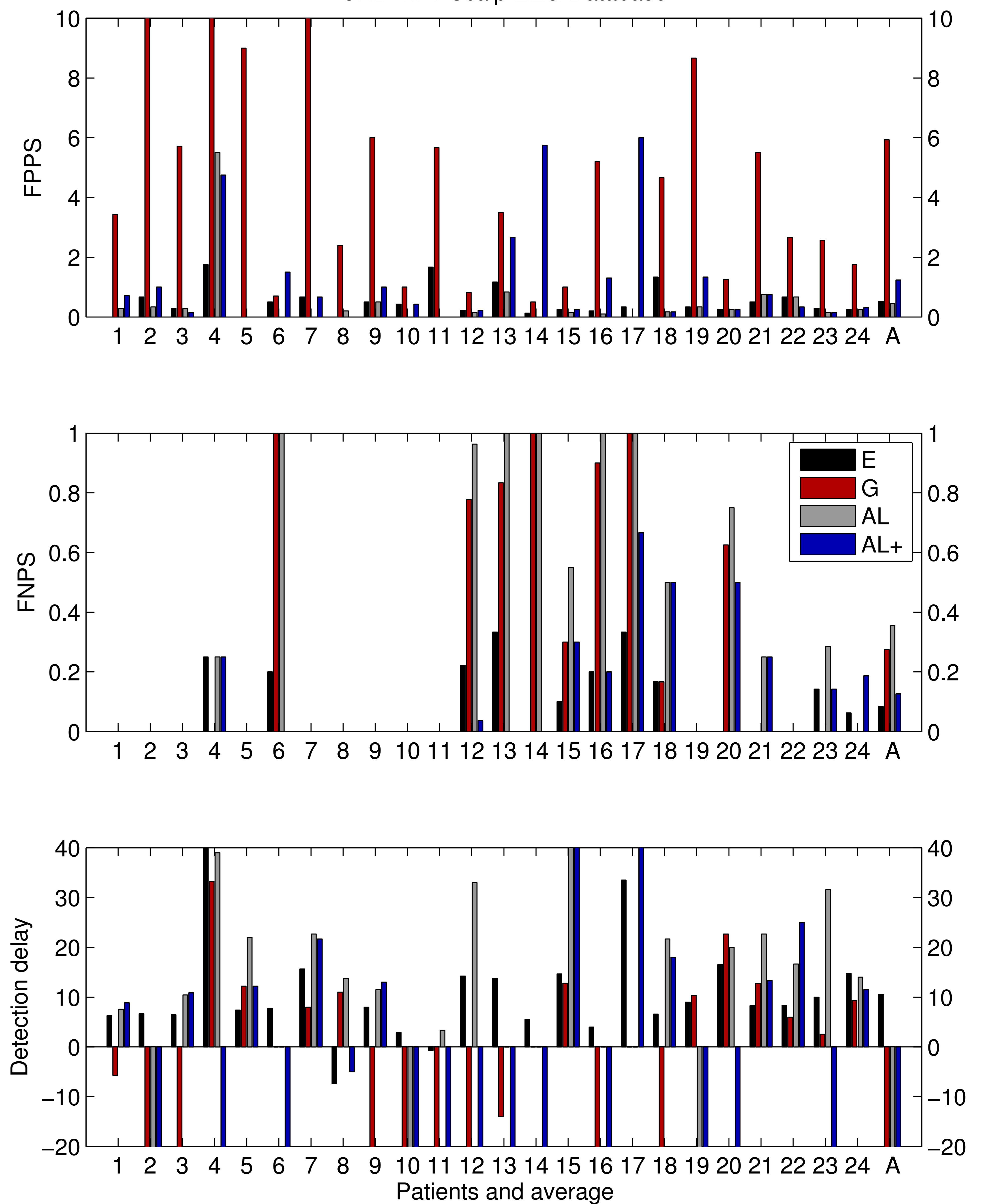
- AL : The patient or caregiver pushes a button when a false positive is detected.
- AL+ : The caregiver also pushes a button when a seizure is missed.

Error Measures

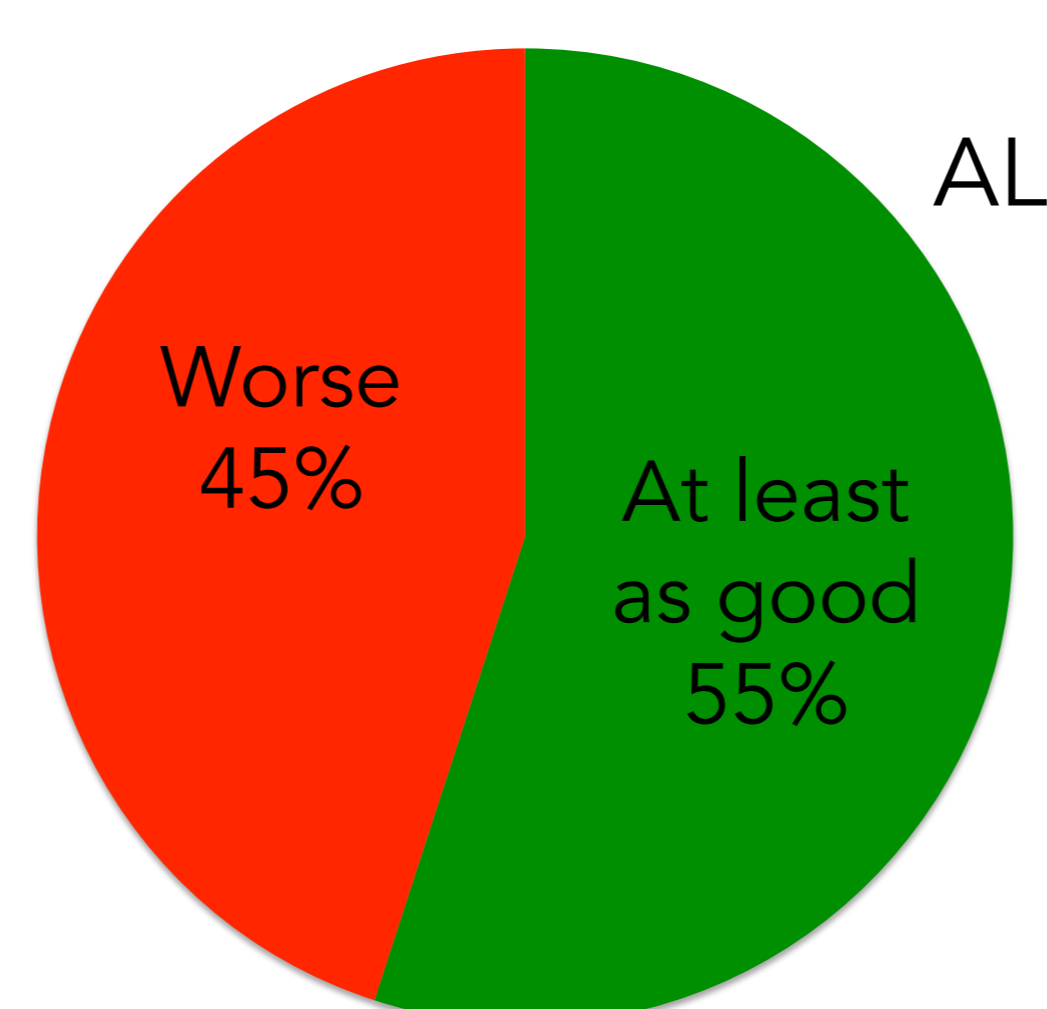
FPPS : False positives per seizure in the dataset
 FNPS : False negatives per seizure in the dataset
 Delay : Time required to detect a seizure

Experiments & Results

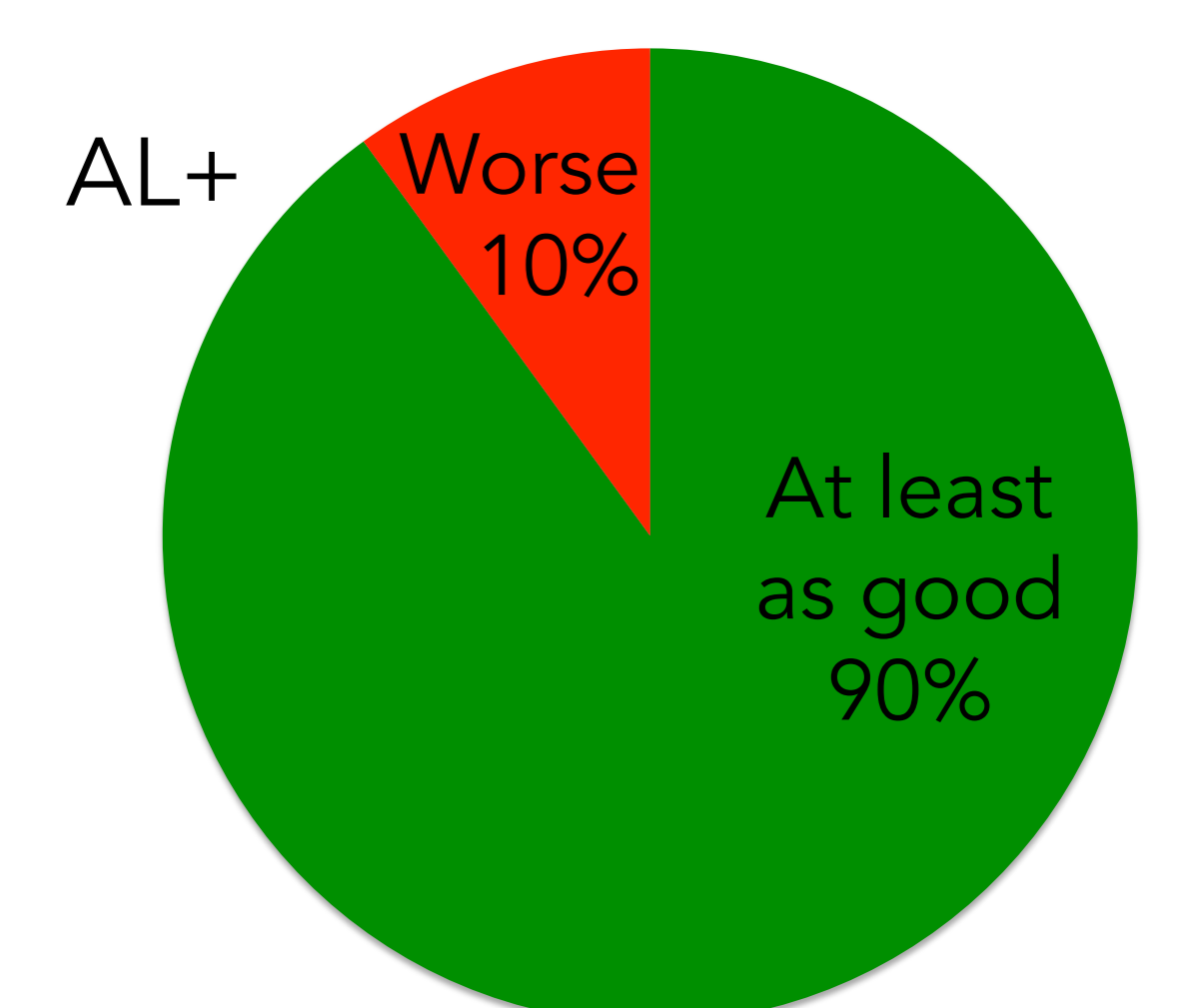
CHB-MIT Scalp EEG Database



Discussion



Comparison per patient with patient-specific model (E).



Conclusion

For most patients video-EEG monitoring and EEG experts are no longer required to build a patient-specific seizure detector.