# Concept-Drifts Adaptation For Machine Learning EEG Epilepsy Seizure Prediction

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## Supplementary Material

### Patient data

**Table 1.** Information for the 37 studied patients.

| Patient ID | Age | Sex | Number of seizures | Seizure classification | Seizure activity pattern | Vigilance at seizure onset | Recording duration (h) |
|---|---|---|---|---|---|---|---|
| 402 | 55 | f | 5 | FOIA, FBTC, FOIA, FBTC, FOIA | t, t, t, t, t | A, A, A, A, A | 133.47 |
| 8902 | 67 | f | 5 | UC, FOIA, FOIA, FOIA, FOIA | a, b, a, m, a | A, A, A, A, A | 156.41 |
| 11002 | 41 | m | 4 | UC, FOIA, FOIA, FOIA | ?, s, a, t | A, R, A, A | 108.86 |
| 16202 | 46 | f | 7 | UC, FBTC, UC, FOIA, FOIA, FOIA, FOIA | r, ?, r, r, r, ?, r | A, A, A, A, A, A, A | 235.77 |
| 21902 | 47 | m | 4 | UC, FOIA, FOIA, FOIA | t, t, t, b | A, A, A, R | 76.84 |
| 23902 | 36 | m | 5 | FOA, FOA, FOA, FOA, FOA | t, t, t, d, t | A, A, A, A, A | 104.69 |
| 26102 | 65 | m | 4 | FOIA, FOIA, FOIA, FOIA | m, t, t, t | A, A, A, A | 83.23 |
| 30802 | 28 | m | 8 | FOA, FOA, FOA, FOA, FOA, FOA, FOA, FOA | t ,t ,t, t, t, t, t, t | R, A, 2, A, A, R, 2, 2 | 149.28 |
| 32702 | 62 | f | 5 | FOIA, FOIA, FOIA, FOIA, FOIA | t ,t ,t, r, a | A, A, A, A, A | 141.87 |
| 45402 | 41 | f | 4 | FOIA, FOIA, FOA, FOIA | t, t, t, t | A, A, A, A | 94.29 |
| 46702 | 15 | f | 5 | FOA, FOIA, FOIA, FBTC, FOIA | a, a, t, b, t | A, 2, A, 2, A | 60.06 |
| 50802 | 43 | m | 5 | FOIA, UC, UC, FOIA, FBTC | t, t, t, t, t | A, 2, 2, 2, A | 201.53 |
| 53402 | 39 | m | 4 | FOA, FOA, FOA, FOIA | ?, ?, ?, T | A, 2, A, A | 84.04 |
| 55202 | 17 | f | 8 | FOIA, FOIA, FOA, UC, UC, FOA, UC, FOIA | t, d, t, t, t, t, r, r | A, A, A, A, A, A, A, A | 112.42 |
| 56402 | 47 | m | 4 | UC, UC, UC, FBTC | t, ?, ?, A | A, A, A, A | 204.47 |
| 58602 | 32 | m | 6 | FOIA, FOIA, FOIA, FOIA, FOIA, FOIA | r, t, t, r, r, t | A, R, A, A, A, 2 | 120.28 |
| 59102 | 47 | m | 5 | FOA, FOIA, FOIA, FOIA, FOA | ?, t, t, t, t | A, A, A, A, A | 148.05 |
| 60002 | 55 | m | 6 | FOIA, FOIA, FOIA, UC, FOIA, FOIA | d, c, t, t, d, d | 1, A, A, R, R, 1 | 360.51 |
| 64702 | 51 | m | 5 | FOA, FBTC, FBTC, FBTC, FBTC | ?, m, t, t, t | A, A, A, A, 2 | 107.5 |
| 75202 | 13 | m | 7 | FOA, FOA, UC, FOA, FOA, FOA, FOA | t, t, t, t, t, ?, t | 2, 2, A, A, A, A, A | 153.57 |
| 80702 | 22 | f | 6 | FOIA, FOIA, UC, FOIA, FBTC, FOIA | b, b, ?, c, c, c | A, A, A, A, A, A | 78.95 |
| 85202 | 54 | f | 5 | FOIA, FOIA, UC, UC, UC | m, c, m, m, m | 2, A, A, A, A | 73.91 |
| 93402 | 67 | m | 5 | FBTC, FOIA, FOIA, UC, UC | t, t, t, t, t | 2, 2, 2, 2, 2 | 152.07 |
| 93902 | 50 | m | 6 | FOA, FOIA, FBTC, FOIA, FOIA, UC | t, t, d, d, d, d | A, A, 2, A, 2, A | 391.12 |
| 94402 | 37 | f | 7 | FOA, UC, FOIA, UC, FOA, UC, FOA | ?, d, b, t, ?, b, ? | A, A, A, 2, A ,2, A | 150.6 |
| 95202 | 50 | f | 7 | FBTC, FOIA, FOIA, FOIA, UC, FOIA, UC | b, b, b, m, b, b, t | 2, 2, 2, 2, 2, 2, 2 | 147.13 |
| 96002 | 58 | m | 7 | FOIA, FOIA, FOIA, FOIA, UC, FOIA, FOIA | t, t, t, d ,a ,t ,a | A, A, A, A, A, A, A | 130.6 |
| 98102 | 36 | m | 5 | FOA, UC, UC, UC, FBTC | ?, ?, ?, ?, ? | A, A, A, A, A | 154.29 |
| 101702 | 52 | m | 5 | FOIA, FOIA, FOIA, FOIA, FOIA | t, t, t, r, r | A, A, A, 2, A | 52.24 |
| 102202 | 17 | m | 7 | FOA, UC, FOIA, UC, FOA, FOIA, UC | b, ?, t, ?, t, t, t | 2, A, 2, A, A, 2, A | 108.86 |
| 104602 | 17 | f | 5 | FOIA, FBTC, FBTC, FBTC, UC | t, a, t, t, d | A, 2, 2, 2, 2 | 103.12 |
| 109502 | 50 | m | 4 | FOIA, FOIA, UC, UC | t, t, t, t | A, A, A, A | 115.55 |
| 112802 | 52 | m | 6 | UC, FOIA, UC, FOIA, FOIA, UC | t, t, t, t, t, t | A, A, A, A, A, A | 183.08 |
| 113902 | 29 | f | 6 | UC, FOIA, FOIA, FOIA, UC, FOIA | t, d, t, t, t, t | A, A, 2, A, 2, A | 84.71 |
| 114702 | 22 | f | 8 | FOIA, FOIA, UC, FOIA, FOIA, FOIA, FOIA, FOIA | t, t, t, t, d, t, d, t | A, A, A, A, A, A, A, A | 102.43 |
| 114902 | 16 | f | 7 | FOA, FOIA, FOIA, FBTC, UC, FOIA, FOIA | s, b, s, t, r, a, t | A, A, A, 2, A, A, A | 77.21 |
| 123902 | 25 | f | 5 | FBTC, FBTC, FOIA, FOIA, FOA | t, t, t, t, t | 2, 2, R, A, A | 182.26 |

Gender: female (f), male (m); Seizure classification: unclassified (UC), Focal Onset Aware (FOA), Focal Onset Impaired (FOIA), Focal to Bilateral Tonic-Clonic (FBTC); Seizure activity pattern: unclear (?), rhythmic sharp waves (s), rhythmic alpha waves (a), rhythmic delta waves (d), rhythmic theta waves (t), rhythmic beta waves (b), repetitive spiking (r), cessation of interictal activity (c), amplitude depression (m); Vigilance state: awake (A), REM sleep stage (R), Non-REM sleep stage I (1), Non-REM sleep stage II (2).

## Feature Description

Here we provide a more detailed description of the features used in this study. We only used linear univariate features. Linear features are mathematical measures that extract linear dynamics from signals using phase/frequency and amplitude information. When these features are extracted, the EEG signal is considered quasi-stationary within each time window.

### *Statistical Moments*

The Electroencephalogram (EEG) time series amplitude distribution can be determined using statistical moments. The first four statistical moments are the mean, variance, skewness, kurtosis[1–5]. As univariate linear measures are light to compute. They can also be used on characteristics other than the electrical amplitude, such as spectral information[3,6]. For symmetric amplitude distributions, the skewness is zero; for asymmetric distributions, it is non-zero. The kurtosis assesses how peaked or flat an amplitude distribution is[7]. According to Rasekhi et al.[8], these statistical measures have demonstrated considerable changes between the interictal and preictal states. Compared to interictal data, the preictal period showed a decrease in variance and an increase in kurtosis[5].

### *Hjörth parameters*

Hjörth parameters concern activity, mobility, and complexity, which are measures of mean power, root-mean-squared frequency, and root-mean-square frequency spread, respectively. These monitor an increase in brain activity that increases energy[2–5,9]. Authors[8,10] have reported a significant increase of the mobility and complexity of the EEG during the preictal stage.

### *Decorrelation time*

The decorrelation time is defined as the first zero crossing of the autocorrelation function and gives information about the data variability's usual time scale. It estimates the periodicity of data and the strength of linear relationships; the lower its values, the less correlated the signal. This function may also be used to assess signal stochasticity since a temporal value of zero decorrelation indicates that a particular signal is entirely stochastic (white noise). Authors[3,5,8,10] have reported a reduction in decorrelation time before seizures.

### *Relative spectral power*

The signal power associated with particular frequency ranges (delta, theta, alpha, beta, and gamma) is quantified by spectral power. Authors then utilise these ranges to extract features that capture low to high-frequency transitions. These are the most commonly used characteristics[2–5,8,9,11] and may be determined using the Power Spectral Density (PSD). The PSD can be calculated by performing the Fast Fourier Transform (FFT) on the EEG time series and then averaging the squared coefficients of the frequency range of interest. It is critical to note that the PSD calculation presupposes that the signal in each window is short enough to be deemed quasi-stationarity and long enough to capture the brain's low-frequency activity. The power of a specific frequency band divided by the overall power of the EEG signal characterises the relative spectral power. Because there is more power in low frequencies than in high frequencies, normalised spectral power gives a more robust measurement. Some authors documented a power shift from lower to higher frequencies before seizure onset[3,5,8,12]. For example, Mormann et al.[10] demonstrated a drop in Delta band power, accompanied by a fall in relative power in the other sub-bands. Bandarabadi et al.[12] showed that relative combinations of sub-band spectral energies across channel pairs might be used to follow progressive changes before seizures.

### *Spectral edge frequency*

Spectral edge frequency (SEF) is usually referred to as the minimum frequency below which a specified proportion of the total power of the signal is contained, and it is frequently used in seizure prediction[5,8,10]. Most of the spectral strength in the EEG signal is contained in the 0-40Hz band[7]. SEF 50 is the frequency at which 50% of the signal's overall power is situated. As a result, SEF may be able to detect a power shift from low to high frequencies during the preictal phase[3,5].

### *Wavelet transform*

The wavelet transform is a time-frequency domain transform that can be used in place of the FFT. It can show the spectral and temporal features of a signal. The wavelet transform divides the signal into several resolution levels based on the frequency ranges[2,3,5,8]. The first decomposition layers correspond to higher frequencies, whereas the latter levels correspond to lower frequencies. After the signal decomposition, it is possible to compute discriminant features from distinct frequency bands by applying the wavelet coefficients. A characteristic that may be acquired with the wavelet transform is energy measurement in different frequency ranges[3,5,8].

## Control method

We used a control methodology to verify the performance of our approach, inspired by the study from Direito et al.[3] used a patient-specific layered structure, which includes filtering, feature extraction and classification. Input signals were filtered by a fourth-order Butterworth Infinite Impulse Response (IIR) from 48Hz to 52Hz to remove the noise related to the power line. The signals were firstly segmented into 5-second windows, where they extracted 22 univariate features, such as: Auto-regressive (AR) modelling predictive error, Decorrelation time, Energy, Hjörth parameters mobility and complexity, Spectral edge frequency and power, mean, variance, skewness and kurtosis, and Energy of wavelet coefficients. This output resulted in a total of 132 features from the combination of six scalp EEG input channels. We used the extracted features to train the linear-SVM classification model, which is computationally light while presenting comparable performances in relatively high-dimensional spaces[3].

The training phase used a cross-fold validation method to get the required configuration parameters. They used a grid-search to optimise the hyperparameter $C$ (known as cost and represents the trade-off between the classification margin and non-separable patterns). For the grid-search, they used 3-fold cross-validation with the first three chronological seizures: fold 1 used seizures #1 and #2 for training, and #3 for validation; fold 2 used seizures #1 and #3 for training, and #2 for validation; and fold 3 used seizures #2 and #3 for training, and #1 for validation. Over an array of possible values [$2^1$, $2^4$, $2^7$, $2^{10}$, $2^{13}$, $2^{16}$]. A second optimisation step was performed around the best candidate $C_0$, using the array of values $C_0$*[$2^{-1.5}$, $2^{-0.5}$, $2^{0.5}$, $2^{1.5}$]. The remaining seizures comprised the testing group, we smoothed the classifier output with the Firing Power technique, with a threshold value of (0.5) to prevent rapid changes and, thus, be robust to noise.

We replaced the filtering/decomposition and feature extraction processes of the study from Direito et al.[3] with ours and added a filter feature selection method based on the ANOVA (Analysis of Variance) f-test, which estimates the degree of linear dependency between each feature and the target. We selected the most discriminative features according to their ranking. For the number of features, we used the first three chronological seizures for a grid-search (10, 20, 30, 40 features) that optimises the Sample Sensitivity ($S_{ss}$) and Sample Specificity ($S_{sp}$): $\sqrt{S_{ss} * S_{sp}}$. We also used this grid search to find the best pre-ictal period (10, 15, 20, 25, 30, 35, 40, 45, 50 minutes) and the cost $C$ over an array of possible values [$2^{-10}$, $2^{-8}$, $2^{-6}$, $2^{-4}$, $2^{-2}$, $2^0$, $2^2$, $2^4$, $2^6$, $2^8$, $2^{10}$]. In testing, we also implemented the Firing Power to smooth the output over time, with the same threshold value of 0.5. We also used refractory periods as in Direito et al.[3]. This methodology is patient-specific.

## Concept-Drifts adaptation algorithm details

In this section, we show the pseudocode for each proposed algorithm.

**Algorithm 1 Backwards-Landmark Window** Pseudocode illustrating the window adjustment method by optimising performance with SVMs.

input ← $Z = S$ training samples in $t$ batches of $n$ samples (1-hour) each
**for** $h \in 0, ..., t$-1 **do**
  train SVM on samples [$Z(t$-$h$,1),...,$Z(t,n)$]
  compute the leave-one-out-estimate on samples [$Z(t$-$h$,1),...,$Z(t,n)$]
  $m$ = estimate.linear_regression(last 12 hours).slope
  **if** $m \geq 0.05$ **then**
    stop window adjustment
  **end if**
**end for**
output ← $W$ = window size which minimises the leave-one-out-estimate

**Algorithm 2 Seizure-batch Regression** Pseudocode illustrating the concept drift tracker via regression.

input $\leftarrow Z = S$ training seizures
test seizure index $\leftarrow T_i$ = length of $Z$
validation seizure index $\leftarrow V_i = T_i$ - 1 (last training seizure)
**for** $h \in 0, ..., V_i$ **do**
  combination of seizures $\leftarrow C = \mathrm{S}(h : V_i)$
  weight vector combination of seizures $\leftarrow \vec{w_1}$ = logistic regression($C$)
  weight vector validation seizure $\leftarrow \vec{w_2}$ = logistic regression[$S(V_i)$]
  $\theta_h = \theta(\vec{w_1}, \vec{w_2})$
**end for**
output $\leftarrow C_{optimal}$ = combination with the smallest angle

**Algorithm 3 Dynamic Weighted Ensemble** Pseudocode illustrating the dynamic integration of classifiers for handling concept drift.

input $\leftarrow Z = S$ training seizures
window size $\leftarrow W$ = 1-hour
**for** seizure index $\in$ 0, ..., S-1 **do**
  windows = windowing($S$[seizure index)]
  **for** $h \in 0, ..., t$-1 **do**
    segment = windows($h$)
    classifier(seizure index,h).train[segment + $S$(seizure index).SOP]
    $W$(seizure index,$h$) = classifier(seizure index,h).accuracy[$S(t-1)$.last-2-hours]
  **end for**
**end for**
output $\leftarrow W$ = ensemble weights

## Results

### *Iterative Retraining*

**Table 2.** Training parameters and performance obtained for each patient for the Control data partitioning.

| Control partitioning | | | | | |
|---|---|---|---|---|---|
| **Patient** | **SOP** | **k** | **C** | $\mathbf{SS}_{sample}$ | $\mathbf{SP}_{sample}$ |
| 402 | 10 | 20 | $2^{-10}$ | 0.43 | 0.71 |
| 8902 | 20 | 40 | $2^{-10}$ | 0.88 | 0.83 |
| 11002 | 15 | 10 | $2^{6}$ | 0.45 | 0.71 |
| 16202 | 15 | 40 | $2^{-4}$ | 0.64 | 0.83 |
| 21902 | 10 | 10 | $2^{-10}$ | 0.67 | 0.61 |
| 23902 | 50 | 40 | $2^{-10}$ | 0.68 | 0.53 |
| 26102 | 50 | 40 | $2^{8}$ | 0.31 | 0.62 |
| 30802 | 50 | 30 | $2^{-10}$ | 0.90 | 0.79 |
| 32702 | 15 | 10 | $2^{-10}$ | 0.75 | 0.69 |
| 45402 | 15 | 40 | $2^{-10}$ | 0.72 | 0.56 |
| 46702 | 40 | 40 | $2^{8}$ | 0.22 | 0.67 |
| 50802 | 15 | 10 | $2^{-4}$ | 0.83 | 0.84 |
| 53402 | 40 | 10 | $2^{-10}$ | 0.48 | 0.66 |
| 55202 | 10 | 30 | $2^{-4}$ | 0.53 | 0.72 |
| 56402 | 10 | 10 | $2^{-6}$ | 0.74 | 0.68 |
| 58602 | 10 | 10 | $2^{0}$ | 0.30 | 0.70 |
| 59102 | 15 | 10 | $2^{-10}$ | 0.63 | 0.45 |
| 60002 | 15 | 10 | $2^{-4}$ | 0.54 | 0.72 |
| 64702 | 35 | 20 | $2^{-10}$ | 0.46 | 0.67 |
| 75202 | 30 | 30 | $2^{-8}$ | 0.72 | 0.83 |
| 80702 | 45 | 30 | $2^{2}$ | 0.41 | 0.73 |
| 85202 | 15 | 30 | $2^{2}$ | 0.45 | 0.67 |
| 93402 | 50 | 10 | $2^{8}$ | 0.52 | 0.54 |
| 93902 | 40 | 30 | $2^{-2}$ | 0.62 | 0.56 |
| 94402 | 10 | 40 | $2^{2}$ | 0.40 | 0.68 |
| 95202 | 10 | 10 | $2^{-10}$ | 0.74 | 0.66 |
| 96002 | 40 | 10 | $2^{6}$ | 0.84 | 0.64 |
| 98102 | 35 | 10 | $2^{8}$ | 0.50 | 0.53 |
| 101702 | 10 | 10 | $2^{-8}$ | 0.58 | 0.53 |
| 102202 | 50 | 10 | $2^{0}$ | 0.35 | 0.66 |
| 104602 | 15 | 40 | $2^{8}$ | 0.35 | 0.66 |
| 109502 | 10 | 10 | $2^{-10}$ | 0.58 | 0.53 |
| 112802 | 10 | 30 | $2^{-10}$ | 0.55 | 0.56 |
| 113902 | 45 | 30 | $2^{-8}$ | 0.42 | 0.55 |
| 114702 | 35 | 20 | $2^{2}$ | 0.28 | 0.70 |
| 114902 | 20 | 20 | $2^{0}$ | 0.47 | 0.63 |
| 123902 | 10 | 40 | $2^{-6}$ | 0.80 | 0.85 |
| Overall | - | - | - | $0.56 \pm 0.18$ | $0.66 \pm 0.10$ |

**Table 3.** Training parameters and performance obtained for each patient for the Add-One-Forget-One data partitioning and iterative retraining.

| | | | Add-One-Forget-One | | |
|---|---|---|---|---|---|
| **Patient** | **SOP** | **k** | **C** | **SS**$_{sample}$ | **SP**$_{sample}$ |
| 402 | 40, 20 | 10, 10 | $2^{-10}$,$2^{-4}$ | 0.53, 0.42 | 0.62, 0.65 |
| 8902 | 20, 20 | 10, 10 | $2^{-10}$,$2^{-10}$ | 0.87, 0.91 | 0.84, 0.81 |
| 11002 | 15 | 20 | $2^{-10}$ | 0.51 | 0.68 |
| 16202 | 15, 10, 50, 20 | 30, 30, 10, 40 | $2^{-10}$,$2^{-4}$,$2^{-8}$,$2^{-6}$ | 0.63, 0.42, 0.52, 0.24 | 0.82, 0.73, 0.79, 0.71 |
| 21902 | 10 | 20 | $2^{2}$ | 0.66 | 0.61 |
| 23902 | 45, 10 | 40, 40 | $2^{-10}$,$2^{-10}$ | 0.69, 0.51 | 0.52, 0.66 |
| 26102 | 50 | 40 | $2^{6}$ | 0.31 | 0.59 |
| 30802 | 50, 50, 35, 10, 50 | 40, 40, 30, 10, 10 | $2^{-8}$,$2^{-4}$,$2^{-8}$,$2^{-10}$,$2^{-10}$ | 0.90, 0.58, 0.38, 0.56, 0.78 | 0.80, 0.79, 0.64, 0.71, 0.53 |
| 32702 | 15, 20 | 10, 20 | $2^{-10}$,$2^{-10}$ | 0.77, 0.75 | 0.67, 0.72 |
| 45402 | 15 | 10 | $2^{-2}$ | 0.72 | 0.53 |
| 46702 | 45, 15 | 30, 10 | $2^{-4}$,$2^{-10}$ | 0.23, 0.65 | 0.67, 0.78 |
| 50802 | 15, 20 | 30, 20 | $2^{-8}$,$2^{-10}$ | 0.80, 0.58 | 0.83, 0.79 |
| 53402 | 40 | 30 | $2^{8}$ | 0.47 | 0.65 |
| 55202 | 10, 15, 25, 10, 10 | 10, 10, 10, 10, 10 | $2^{-10}$,$2^{-10}$,$2^{-10}$,$2^{-10}$,$2^{-8}$ | 0.61, 0.65, 0.70, 0.89, 0.63 | 0.66, 0.70, 0.49, 0.73, 0.58 |
| 56402 | 10 | 10 | $2^{-8}$ | 0.80 | 0.64 |
| 58602 | 10, 10, 10 | 10, 40, 40 | $2^{4}$,$2^{-4}$,$2^{-10}$ | 0.24, 0.33, 0.53 | 0.71, 0.79, 0.75 |
| 59102 | 15, 50 | 40, 40 | $2^{4}$,$2^{-2}$ | 0.64, 0.36 | 0.45, 0.44 |
| 60002 | 15, 30, 40 | 10, 10, 40 | $2^{-8}$,$2^{-8}$,$2^{-10}$ | 0.58, 0.20, 0.55 | 0.72, 0.67, 0.7 |
| 64702 | 30, 20 | 30, 40 | $2^{-10}$,$2^{-10}$ | 0.42, 0.80 | 0.68, 0.67 |
| 75202 | 30, 10, 10, 50 | 30, 20, 40, 40 | $2^{-10}$,$2^{-10}$,$2^{-10}$,$2^{2}$ | 0.71, 0.70, 0.68, 0.83 | 0.83, 0.80, 0.70, 0.56 |
| 80702 | 45, 45, 10 | 20, 20, 40 | $2^{-10}$,$2^{-10}$,$2^{-8}$ | 0.38, 0.54, 0.73 | 0.73, 0.58, 0.36 |
| 85202 | 15, 40 | 30, 20 | $2^{6}$,$2^{8}$ | 0.45, 0.63 | 0.66, 0.67 |
| 93402 | 50, 20 | 10, 10 | $2^{-10}$,$2^{2}$ | 0.57, 0.45 | 0.52, 0.75 |
| 93902 | 40, 50, 15 | 30, 30, 10 | $2^{-10}$,$2^{-10}$,$2^{-10}$ | 0.60, 0.73, 0.58 | 0.57, 0.59, 0.54 |
| 94402 | 10, 40, 15, 15 | 10, 10, 30, 40 | $2^{4}$,$2^{-10}$,$2^{-6}$,$2^{-10}$ | 0.41, 0.23, 0.13, 0.54 | 0.63, 0.64, 0.77, 0.84 |
| 95202 | 10, 45, 50, 25 | 10, 40, 10, 10 | $2^{-10}$,$2^{8}$,$2^{-10}$,$2^{-10}$ | 0.76, 0.33, 0.22, 0.55 | 0.65, 0.71, 0.64, 0.63 |
| 96002 | 35, 20, 15, 30 | 40, 30, 40, 20 | $2^{-10}$,$2^{-2}$,$2^{0}$,$2^{-2}$ | 0.81, 0.45, 0.52, 0.63 | 0.65, 0.66, 0.72, 0.79 |
| 98102 | 35, 45 | 40, 20 | $2^{8}$,$2^{-2}$ | 0.51, 0.6 | 0.52, 0.68 |
| 101702 | 10, 45 | 20, 30 | $2^{-6}$,$2^{8}$ | 0.62, 0.47 | 0.50, 0.60 |
| 102202 | 45, 50, 45, 10 | 30, 40, 30, 20 | $2^{0}$,$2^{2}$,$2^{-2}$,$2^{-6}$ | 0.33, 0.43, 0.31, 0.24 | 0.65, 0.51, 0.53, 0.57 |
| 104602 | 25, 50 | 10, 10 | $2^{-10}$,$2^{-10}$ | 0.43, 0.60 | 0.62, 0.67 |
| 109502 | 10 | 10 | $2^{-6}$ | 0.57 | 0.53 |
| 112802 | 10, 10, 10 | 10, 30, 30 | $2^{-10}$,$2^{-4}$,$2^{8}$ | 0.54, 0.26, 0.33 | 0.58, 0.63, 0.64 |
| 113902 | 45, 15, 45 | 20, 30, 40 | $2^{-10}$,$2^{-10}$,$2^{-10}$ | 0.42, 0.64, 0.46 | 0.56, 0.73, 0.61 |
| 114702 | 35, 15, 10, 50, 50 | 30, 40, 20, 10, 40 | $2^{-8}$,$2^{6}$,$2^{6}$,$2^{0}$,$2^{-6}$ | 0.26, 0.24, 0.18, 0.64, 0.62 | 0.73, 0.77, 0.85, 0.54, 0.63 |
| 114902 | 20, 35, 30, 35 | 10, 30, 10, 40 | $2^{-10}$,$2^{6}$,$2^{-10}$,$2^{-10}$ | 0.52, 0.15, 0.3, 0.43 | 0.62, 0.66, 0.76, 0.76 |
| 123902 | 10, 10 | 40, 10 | $2^{-6}$,$2^{-4}$ | 0.79, 0.65 | 0.84, 0.83 |
| Overall | - | - | - | 0.53 ± 0.19 | 0.66 ± 0.10 |

**Table 4.** Training parameters and performance obtained for each patient for the Chronological Accumulation data partitioning and iterative retraining.

| Chronological Accumulation | | | | | |
|---|---|---|---|---|---|
| **Patient** | **SOP** | **k** | **C** | **SS**$_{sample}$ | **SP**$_{sample}$ |
| 402 | 40, 50 | 10, 40 | $2^{-10}, 2^{6}$ | 0.54, 0.59 | 0.62, 0.59 |
| 8902 | 20, 20 | 10, 10 | $2^{0}, 2^{4}$ | 0.87, 0.91 | 0.84, 0.85 |
| 11002 | 15 | 20 | $2^{-10}$ | 0.50 | 0.69 |
| 16202 | 15, 10, 15, 10 | 10, 30, 30, 40 | $2^{-10}, 2^{2}, 2^{2}, 2^{6}$ | 0.59, 0.49, 0.59, 0.47 | 0.83, 0.82, 0.74, 0.74 |
| 21902 | 10 | 40 | $2^{-10}$ | 0.67 | 0.61 |
| 23902 | 45, 15 | 40, 10 | $2^{-8}, 2^{-10}$ | 0.69, 0.48 | 0.52, 0.68 |
| 26102 | 50 | 40 | $2^{6}$ | 0.31 | 0.58 |
| 30802 | 50, 50, 50, 35, 35 | 40, 20, 20, 40, 10 | $2^{-8}, 2^{-10}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.90, 0.72, 0.76, 0.79, 0.79 | 0.79, 0.78, 0.65, 0.66, 0.59 |
| 32702 | 15, 15 | 10, 10 | $2^{-2}, 2^{-10}$ | 0.74, 0.82 | 0.71, 0.71 |
| 45402 | 10 | 40 | $2^{-10}$ | 0.66 | 0.60 |
| 46702 | 35, 25 | 40, 40 | $2^{-2}, 2^{8}$ | 0.20, 0.49 | 0.68, 0.63 |
| 50802 | 15, 20 | 30, 30 | $2^{-10}, 2^{-10}$ | 0.80, 0.73 | 0.84, 0.77 |
| 53402 | 45 | 20 | $2^{-4}$ | 0.48 | 0.67 |
| 55202 | 10, 10, 10, 10, 10 | 10, 10, 10, 10, 10 | $2^{-10}, 2^{-10}, 2^{-10}, 2^{-10}, 2^{-8}$ | 0.50, 0.74, 0.69, 0.67, 0.71 | 0.73, 0.67, 0.55, 0.64, 0.61 |
| 56402 | 10 | 20 | $2^{-10}$ | 0.79 | 0.64 |
| 58602 | 10, 10, 15 | 40, 40, 30 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.26, 0.62, 0.56 | 0.72, 0.67, 0.62 |
| 59102 | 15, 50 | 10, 10 | $2^{-10}, 2^{-10}$ | 0.66, 0.52 | 0.44, 0.43 |
| 60002 | 15, 20, 15 | 30, 20, 20 | $2^{-10}, 2^{-10}, 2^{-8}$ | 0.55, 0.41, 0.36 | 0.71, 0.69, 0.63 |
| 64702 | 25, 15 | 30, 40 | $2^{-6}, 2^{-4}$ | 0.41, 0.58 | 0.68, 0.68 |
| 75202 | 30, 10, 30, 40 | 10, 10, 10, 30 | $2^{-4}, 2^{-10}, 2^{-10}, 2^{-4}$ | 0.71, 0.73, 0.69, 0.68 | 0.83, 0.82, 0.62, 0.61 |
| 80702 | 45, 45, 40 | 40, 40, 40 | $2^{8}, 2^{4}, 2^{0}$ | 0.43, 0.54, 0.49 | 0.73, 0.69, 0.69 |
| 85202 | 15, 15 | 20, 30 | $2^{0}, 2^{2}$ | 0.44, 0.57 | 0.66, 0.69 |
| 93402 | 50, 20 | 20, 40 | $2^{4}, 2^{-6}$ | 0.57, 0.44 | 0.52, 0.75 |
| 93902 | 40, 45, 40 | 40, 10, 30 | $2^{0}, 2^{-6}, 2^{-6}$ | 0.60, 0.78, 0.73 | 0.57, 0.53, 0.44 |
| 94402 | 20, 20, 50, 10 | 10, 10, 30, 10 | $2^{0}, 2^{-4}, 2^{0}, 2^{-8}$ | 0.46, 0.23, 0.28, 0.27 | 0.57, 0.69, 0.58, 0.65 |
| 95202 | 10, 30, 10, 40 | 10, 30, 40, 10 | $2^{-10}, 2^{4}, 2^{0}, 2^{-10}$ | 0.74, 0.28, 0.68, 0.55 | 0.66, 0.62, 0.66, 0.55 |
| 96002 | 30, 15, 25, 25 | 40, 40, 40, 30 | $2^{-2}, 2^{4}, 2^{-10}, 2^{-10}$ | 0.82, 0.56, 0.62, 0.62 | 0.64, 0.66, 0.64, 0.65 |
| 98102 | 35, 50 | 40, 10 | $2^{-8}, 2^{2}$ | 0.50, 0.69 | 0.52, 0.65 |
| 101702 | 10, 40 | 30, 40 | $2^{-4}, 2^{-2}$ | 0.49, 0.60 | 0.60, 0.51 |
| 102202 | 45, 50, 20, 50 | 20, 10, 40, 40 | $2^{-4}, 2^{-4}, 2^{-2}, 2^{0}$ | 0.35, 0.46, 0.52, 0.51 | 0.65, 0.75, 0.67, 0.55 |
| 104602 | 35, 35 | 20, 20 | $2^{-10}, 2^{-4}$ | 0.42, 0.48 | 0.61, 0.66 |
| 109502 | 10 | 10 | $2^{-10}$ | 0.56 | 0.54 |
| 112802 | 45, 50, 10 | 10, 30, 40 | $2^{2}, 2^{-6}, 2^{-4}$ | 0.31, 0.30, 0.51 | 0.70, 0.62, 0.44 |
| 113902 | 45, 10, 50 | 40, 30, 10 | $2^{6}, 2^{-4}, 2^{8}$ | 0.43, 0.50, 0.65 | 0.55, 0.69, 0.47 |
| 114702 | 35, 45, 10, 15, 15 | 30, 40, 40, 10, 30 | $2^{-10}, 2^{-4}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.25, 0.36, 0.44, 0.4, 0.57 | 0.73, 0.55, 0.63, 0.63, 0.53 |
| 114902 | 20, 20, 35, 35 | 20, 30, 10, 10 | $2^{-4}, 2^{2}, 2^{-10}, 2^{-10}$ | 0.46, 0.37, 0.54, 0.6 | 0.65, 0.59, 0.56, 0.61 |
| 123902 | 15, 10 | 40, 10 | $2^{-10}, 2^{-10}$ | 0.80, 0.64 | 0.81, 0.85 |
| Overall | - | - | - | 0.56 ± 0.16 | 0.64 ± 0.10 |

**Table 5.** Testing performance obtained for each patient with the Control data partitioning method.

**Control partitioning**

| Patient | Evaluated seizures | SOP | SS | FPR/h | SS Surrogate | p-value | Above chance |
|---|---|---|---|---|---|---|---|
| 402 | 2 | 10 | 0.50 | 5.34 | 0.17 ± 0.24 | 0.00 | • |
| 8902 | 2 | 20 | 1.00 | 0.16 | 0.10 ± 0.20 | 0.00 | • |
| 11002 | 1 | 15 | 1.00 | 0.57 | 0.07 ± 0.25 | 0.00 | • |
| 16202 | 4 | 15 | 0.00 | 0.07 | 0.03 ± 0.08 | 0.96 | |
| 21902 | 1 | 10 | 0.00 | 1.42 | 0.10 ± 0.30 | 0.96 | |
| 23902 | 2 | 50 | 0.00 | 2.93 | 0.68 ± 0.30 | 1.00 | |
| 26102 | 1 | 50 | 1.00 | 1.49 | 0.53 ± 0.50 | 0.00 | • |
| 30802 | 5 | 50 | 0.60 | 0.43 | 0.37 ± 0.16 | 0.00 | • |
| 32702 | 2 | 15 | 0.00 | 0.45 | 0.07 ± 0.17 | 0.98 | |
| 45402 | 1 | 15 | 0.00 | 3.40 | 0.33 ± 0.47 | 1.00 | |
| 46702 | 2 | 40 | 0.50 | 1.77 | 0.38 ± 0.36 | 0.04 | • |
| 50802 | 2 | 15 | 0.00 | 0.47 | 0.07 ± 0.17 | 0.98 | |
| 53402 | 1 | 40 | 0.00 | 0.99 | 0.30 ± 0.46 | 1.00 | |
| 55202 | 5 | 10 | 0.40 | 2.32 | 0.28 ± 0.20 | 0.00 | • |
| 56402 | 1 | 10 | 1.00 | 5.94 | 0.33 ± 0.47 | 0.00 | • |
| 58602 | 3 | 10 | 0.00 | 2.54 | 0.19 ± 0.28 | 1.00 | |
| 59102 | 2 | 15 | 0.50 | 10.04 | 0.48 ± 0.42 | 0.42 | |
| 60002 | 3 | 15 | 0.00 | 1.03 | 0.16 ± 0.22 | 1.00 | |
| 64702 | 2 | 35 | 0.50 | 0.89 | 0.15 ± 0.23 | 0.00 | • |
| 75202 | 4 | 30 | 0.00 | 0.11 | 0.03 ± 0.08 | 0.98 | |
| 80702 | 3 | 45 | 0.67 | 1.74 | 0.44 ± 0.22 | 0.00 | • |
| 85202 | 2 | 15 | 0.00 | 0.17 | 0.02 ± 0.09 | 0.84 | |
| 93402 | 2 | 50 | 0.50 | 3.89 | 0.85 ± 0.29 | 1.00 | |
| 93902 | 3 | 40 | 0.33 | 0.46 | 0.29 ± 0.29 | 0.21 | |
| 94402 | 4 | 10 | 0.00 | 3.14 | 0.23 ± 0.23 | 1.00 | |
| 95202 | 4 | 10 | 0.25 | 1.10 | 0.13 ± 0.14 | 0.00 | • |
| 96002 | 4 | 40 | 0.25 | 2.00 | 0.58 ± 0.28 | 1.00 | |
| 98102 | 2 | 35 | 0.50 | 0.21 | 0.10 ± 0.20 | 0.00 | • |
| 101702 | 2 | 10 | 0.50 | 2.39 | 0.25 ± 0.25 | 0.00 | • |
| 102202 | 4 | 50 | 0.50 | 0.32 | 0.13 ± 0.12 | 0.00 | • |
| 104602 | 2 | 15 | 0.50 | 0.88 | 0.23 ± 0.31 | 0.00 | • |
| 109502 | 1 | 10 | 1.00 | 3.23 | 0.33 ± 0.47 | 0.00 | • |
| 112802 | 3 | 10 | 0.33 | 4.49 | 0.38 ± 0.25 | 0.82 | |
| 113902 | 3 | 45 | 0.67 | 2.69 | 0.54 ± 0.24 | 0.00 | • |
| 114702 | 5 | 35 | 0.00 | 0.25 | 0.18 ± 0.17 | 1.00 | |
| 114902 | 4 | 20 | 0.00 | 0.13 | 0.01 ± 0.04 | 0.84 | |
| 123902 | 2 | 10 | 0.00 | 0.00 | 0.00 ± 0.00 | - | |
| Overall | - | - | 0.35 ± 0.35 | 1.88 ± 2.05 | 0.25 ± 0.50 | - | 17 |

**Table 6.** Testing parameters and performance obtained for each patient for with the Add-One-Forget-One data partitioning and iterative retraining method.

| Add-One-Forget-One | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Patient** | **Evaluated seizures** | **SOP** | **SS** | **FPR/h** | **SS Surrogate** | **p-value** | **Above chance** |
| 402 | 2 | 40, 20 | 0.00 | 1.33 | 0.15 ± 0.23 | 1.00 | |
| 8902 | 2 | 20, 20 | 0.00 | 0.30 | 0.10 ± 0.20 | 0.99 | |
| 11002 | 1 | 15 | 0.00 | 4.53 | 0.37 ± 0.48 | 1.00 | |
| 16202 | 4 | 15, 10, 50, 20 | 0.75 | 0.34 | 0.11 ± 0.14 | 0.00 | • |
| 21902 | 1 | 10 | 1.00 | 16.19 | 0.40 ± 0.49 | 0.00 | • |
| 23902 | 2 | 45, 10 | 1.00 | 2.22 | 0.25 ± 0.25 | 0.00 | • |
| 26102 | 1 | 50 | 1.00 | 0.40 | 0.23 ± 0.42 | 0.00 | • |
| 30802 | 5 | 50, 50, 35, 10, 50 | 0.40 | 0.81 | 0.30 ± 0.17 | 0.00 | • |
| 32702 | 2 | 15, 20 | 1.00 | 1.69 | 0.20 ± 0.28 | 0.00 | • |
| 45402 | 1 | 15 | 1.00 | 3.63 | 0.33 ± 0.47 | 0.00 | • |
| 46702 | 2 | 45, 15 | 1.00 | 0.57 | 0.22 ± 0.31 | 0.00 | • |
| 50802 | 2 | 15, 20 | 1.00 | 0.59 | 0.12 ± 0.21 | 0.00 | • |
| 53402 | 1 | 40 | 1.00 | 0.84 | 0.20 ± 0.41 | 0.00 | • |
| 55202 | 5 | 10, 15, 25, 10, 10 | 0.60 | 1.38 | 0.21 ± 0.19 | 0.00 | • |
| 56402 | 1 | 10 | 1.00 | 4.57 | 0.27 ± 0.44 | 0.00 | • |
| 58602 | 3 | 10, 10, 10 | 0.67 | 1.68 | 0.14 ± 0.19 | 0.00 | • |
| 59102 | 2 | 15, 50 | 1.00 | 2.08 | 0.55 ± 0.30 | 0.00 | • |
| 60002 | 3 | 15, 30, 40 | 0.67 | 0.91 | 0.21 ± 0.20 | 0.00 | • |
| 64702 | 2 | 30, 20 | 0.50 | 1.89 | 0.32 ± 0.27 | 0.00 | • |
| 75202 | 4 | 30, 10, 10, 50 | 0.50 | 0.50 | 0.32 ± 0.18 | 0.00 | • |
| 80702 | 3 | 45, 45, 10 | 0.67 | 1.17 | 0.31 ± 0.27 | 0.00 | • |
| 85202 | 2 | 15, 40 | 0.00 | 1.04 | 0.37 ± 0.26 | 1.00 | |
| 93402 | 2 | 50, 20 | 0.50 | 0.45 | 0.22 ± 0.28 | 0.00 | • |
| 93902 | 3 | 40, 50, 15 | 0.67 | 2.21 | 0.32 ± 0.27 | 0.00 | • |
| 94402 | 4 | 10, 40, 15, 15 | 0.50 | 0.73 | 0.15 ± 0.14 | 0.00 | • |
| 95202 | 4 | 10, 45, 50, 25 | 0.75 | 0.53 | 0.16 ± 0.16 | 0.00 | • |
| 96002 | 4 | 35, 20, 15, 30 | 0.50 | 1.15 | 0.23 ± 0.22 | 0.00 | • |
| 98102 | 2 | 35, 45 | 0.50 | 0.54 | 0.30 ± 0.33 | 0.00 | • |
| 101702 | 2 | 10, 45 | 0.50 | 1.60 | 0.30 ± 0.28 | 0.00 | • |
| 102202 | 4 | 45, 50, 45, 10 | 0.50 | 0.42 | 0.15 ± 0.19 | 0.00 | • |
| 104602 | 2 | 25, 50 | 1.00 | 0.75 | 0.32 ± 0.33 | 0.00 | • |
| 109502 | 1 | 10 | 0.00 | 0.00 | 0.00 ± 0.00 | - | |
| 112802 | 3 | 10, 10, 10 | 0.67 | 3.06 | 0.22 ± 0.22 | 0.00 | • |
| 113902 | 3 | 45, 15, 45 | 0.67 | 1.20 | 0.32 ± 0.27 | 0.00 | • |
| 114702 | 5 | 35, 15, 10, 50, 50 | 1.00 | 0.99 | 0.31 ± 0.22 | 0.00 | • |
| 114902 | 4 | 20, 35, 30, 35 | 0.75 | 0.62 | 0.23 ± 0.23 | 0.00 | • |
| 123902 | 2 | 10, 10 | 0.00 | 0.64 | 0.05 ± 0.15 | 0.96 | |
| Overall | - | - | 0.63 ± 0.34 | 1.72 ± 2.65 | 0.26 ± 0.51 | - | 31 |

**Table 7.** Testing parameters and performance obtained for each patient for with the Chronological Accumulation data partitioning and iterative retraining method.

| Chronological Accumulation | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Patient** | **Evaluated seizures** | **SOP** | **SS** | **FPR/h** | **SS Surrogate** | **p-value** | **Above chance** |
| 402 | 2 | 40, 50 | 0.50 | 0.00 | 0.00 ± 0.00 | 0.00 | • |
| 8902 | 2 | 20, 20 | 0.50 | 0.25 | 0.17 ± 0.24 | 0.00 | • |
| 11002 | 1 | 15 | 0.00 | 3.64 | 0.30 ± 0.46 | 1.00 | |
| 16202 | 4 | 15, 10, 15, 10 | 1.00 | 0.33 | 0.07 ± 0.13 | 0.00 | • |
| 21902 | 1 | 10 | 1.00 | 12.19 | 0.37 ± 0.48 | 0.00 | • |
| 23902 | 2 | 45, 15 | 0.50 | 1.95 | 0.38 ± 0.33 | 0.03 | • |
| 26102 | 1 | 50 | 1.00 | 0.31 | 0.13 ± 0.34 | 0.00 | • |
| 30802 | 5 | 50, 50, 50, 35, 35 | 0.60 | 0.70 | 0.35 ± 0.09 | 0.00 | • |
| 32702 | 2 | 15, 15 | 0.50 | 1.74 | 0.20 ± 0.28 | 0.00 | • |
| 45402 | 1 | 10 | 0.00 | 2.08 | 0.27 ± 0.44 | 1.00 | |
| 46702 | 2 | 35, 25 | 1.00 | 0.47 | 0.20 ± 0.24 | 0.00 | • |
| 50802 | 2 | 15, 20 | 1.00 | 0.61 | 0.02 ± 0.09 | 0.00 | • |
| 53402 | 1 | 45 | 1.00 | 0.89 | 0.23 ± 0.42 | 0.00 | • |
| 55202 | 5 | 10, 10, 10, 10, 10 | 0.40 | 1.99 | 0.25 ± 0.18 | 0.00 | • |
| 56402 | 1 | 10 | 1.00 | 4.53 | 0.30 ± 0.46 | 0.00 | • |
| 58602 | 3 | 10, 10, 15 | 0.33 | 1.87 | 0.20 ± 0.25 | 0.00 | • |
| 59102 | 2 | 15, 50 | 1.00 | 2.27 | 0.47 ± 0.22 | 0.00 | • |
| 60002 | 3 | 15, 20, 15 | 0.67 | 1.27 | 0.20 ± 0.2 | 0.00 | • |
| 64702 | 2 | 25, 15 | 1.00 | 2.26 | 0.35 ± 0.32 | 0.00 | • |
| 75202 | 4 | 30, 10, 30, 40 | 1.00 | 0.34 | 0.17 ± 0.19 | 0.00 | • |
| 80702 | 3 | 45, 45, 40 | 0.67 | 0.41 | 0.12 ± 0.16 | 0.00 | • |
| 85202 | 2 | 15, 15 | 0.50 | 0.38 | 0.03 ± 0.12 | 0.00 | • |
| 93402 | 2 | 50, 20 | 0.50 | 0.77 | 0.30 ± 0.28 | 0.00 | • |
| 93902 | 3 | 40, 45, 40 | 1.00 | 2.04 | 0.37 ± 0.29 | 0.00 | • |
| 94402 | 4 | 20, 20, 50, 10 | 0.50 | 0.50 | 0.10 ± 0.14 | 0.00 | • |
| 95202 | 4 | 10, 30, 10, 40 | 1.00 | 0.47 | 0.16 ± 0.15 | 0.00 | • |
| 96002 | 4 | 30, 15, 25, 25 | 0.50 | 2.49 | 0.36 ± 0.24 | 0.00 | • |
| 98102 | 2 | 35, 50 | 1.00 | 0.44 | 0.18 ± 0.27 | 0.00 | • |
| 101702 | 2 | 10, 40 | 0.50 | 1.24 | 0.25 ± 0.25 | 0.00 | • |
| 102202 | 4 | 45, 50, 20, 50 | 0.25 | 0.17 | 0.03 ± 0.08 | 0.00 | • |
| 104602 | 2 | 35, 35 | 1.00 | 0.57 | 0.25 ± 0.25 | 0.00 | • |
| 109502 | 1 | 10 | 0.00 | 0.00 | 0.00 ± 0.00 | - | |
| 112802 | 3 | 45, 50, 10 | 1.00 | 0.21 | 0.21 ± 0.20 | 0.00 | • |
| 113902 | 3 | 45, 10, 50 | 0.67 | 1.67 | 0.48 ± 0.29 | 0.00 | • |
| 114702 | 5 | 35, 45, 10, 15, 15 | 1.00 | 1.36 | 0.19 ± 0.13 | 0.00 | • |
| 114902 | 4 | 20, 20, 35, 35 | 0.75 | 0.34 | 0.11 ± 0.15 | 0.00 | • |
| 123902 | 2 | 15, 10 | 0.50 | 0.63 | 0.12 ± 0.21 | 0.00 | • |
| Overall | - | - | 0.68 ± 0.32 | 1.44 ± 2.06 | 0.23 ± 0.48 | - | 34 |

**Table 8.** Training parameters and performance obtained for each patient with the Backwards-Landmark Window and the Add-One-Forget-One data partitioning and iterative retraining method.

**Add-One-Forget-One - Backwards-Landmark Window**

| Patient | SOP | k | C | $SS_{sample}$ | $SP_{sample}$ |
|---|---|---|---|---|---|
| 402 | 40, 40 | 40, 40 | $2^{-2}, 2^{-4}$ | 0.50, 0.07 | 0.84, 0.53 |
| 8902 | 20, 30 | 10, 10 | $2^{-10}, 2^{0}$ | 0.82, 0.97 | 0.78, 0.78 |
| 11002 | 20 | 10 | $2^{-4}$ | 0.53 | 0.72 |
| 16202 | 15, 25, 50, 10 | 40, 30, 40, 20 | $2^{-10}, 2^{-6}, 2^{-2}, 2^{-10}$ | 0.47, 0.70, 0.25, 0.36 | 0.82, 0.59, 0.75, 0.74 |
| 21902 | 40 | 10 | $2^{6}$ | 0.71 | 0.73 |
| 23902 | 50, 10 | 20, 40 | $2^{-2}, 2^{-6}$ | 0.81, 0.44 | 0.56, 0.75 |
| 26102 | 50 | 20 | $2^{-10}$ | 0.47 | 0.72 |
| 30802 | 10, 10, 50, 25, 50 | 40, 10, 40, 20, 40 | $2^{-10}, 2^{-10}, 2^{2}, 2^{-10}, 2^{-10}$ | 0.59, 0.26, 0.45, 0.59, 0.65 | 0.84, 0.86, 0.53, 0.70, 0.63 |
| 32702 | 15, 15 | 20, 10 | $2^{-10}, 2^{-2}$ | 0.82, 0.83 | 0.76, 0.75 |
| 45402 | 50 | 20 | $2^{2}$ | 0.67 | 0.57 |
| 46702 | 30, 10 | 20, 10 | $2^{-8}, 2^{-10}$ | 0.37, 0.51 | 0.76, 0.85 |
| 50802 | 15, 25 | 10, 20 | $2^{-4}, 2^{-10}$ | 0.73, 0.62 | 0.84, 0.87 |
| 53402 | 45 | 40 | $2^{0}$ | 0.52 | 0.66 |
| 55202 | 35, 10, 25, 10, 10 | 10, 20, 30, 10, 30 | $2^{-6}, 2^{-10}, 2^{2}, 2^{-10}, 2^{-6}$ | 0.62, 0.51, 0.60, 0.94, 0.53 | 0.53, 0.72, 0.56, 0.67, 0.69 |
| 56402 | 15 | 10 | $2^{-4}$ | 0.80 | 0.67 |
| 58602 | 10, 10, 20 | 10, 20, 30 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.45, 0.57, 0.50 | 0.79, 0.85, 0.73 |
| 59102 | 20, 15 | 20, 40 | $2^{-10}, 2^{-4}$ | 0.48, 0.48 | 0.59, 0.37 |
| 60002 | 20, 15, 35 | 20, 20, 40 | $2^{-6}, 2^{-8}, 2^{2}$ | 0.46, 0.51, 0.58 | 0.80, 0.66, 0.54 |
| 64702 | 50, 15 | 20, 10 | $2^{-10}, 2^{-4}$ | 0.37, 0.54 | 0.56, 0.62 |
| 75202 | 30, 10, 45, 35 | 10, 10, 10, 30 | $2^{-4}, 2^{-10}, 2^{-10}, 2^{-4}$ | 0.68, 0.53, 0.31, 0.56 | 0.85, 0.83, 0.85, 0.49 |
| 80702 | 10, 50, 50 | 40, 40, 40 | $2^{8}, 2^{4}, 2^{0}$ | 0.66, 0.54, 0.54 | 0.34, 0.47, 0.54 |
| 85202 | 10, 30 | 20, 30 | $2^{0}, 2^{2}$ | 0.21, 0.59 | 0.85, 0.55 |
| 93402 | 15, 20 | 20, 40 | $2^{4}, 2^{-6}$ | 0.45, 0.67 | 0.71, 0.71 |
| 93902 | 30, 45, 20 | 40, 10, 30 | $2^{0}, 2^{-6}, 2^{-6}$ | 0.42, 0.41, 0.75 | 0.34, 0.24, 0.76 |
| 94402 | 10, 20, 35, 15 | 10, 10, 30, 10 | $2^{0}, 2^{-4}, 2^{0}, 2^{-8}$ | 0.51, 0.17, 0.39, 0.46 | 0.52, 0.79, 0.82, 0.99 |
| 95202 | 10, 35, 40, 10 | 10, 30, 40, 10 | $2^{-10}, 2^{4}, 2^{0}, 2^{-10}$ | 0.82, 0.35, 0.39, 0.76 | 0.57, 0.66, 0.68, 0.90 |
| 96002 | 40, 20, 15, 50 | 40, 40, 40, 30 | $2^{-2}, 2^{4}, 2^{-10}, 2^{-10}$ | 0.43, 0.23, 0.85, 0.33 | 0.63, 0.83, 0.66, 0.87 |
| 98102 | 25, 10 | 40, 10 | $2^{-8}, 2^{2}$ | 0.22, 0.71 | 0.57, 0.68 |
| 101702 | 30, 50 | 30, 40 | $2^{-4}, 2^{-2}$ | 0.63, 0.70 | 0.51, 0.58 |
| 102202 | 10, 20, 10, 15 | 20, 10, 40, 40 | $2^{-4}, 2^{-4}, 2^{-2}, 2^{0}$ | 0.54, 0.49, 0.22, 0.56 | 0.63, 0.7, 0.9, 0.54 |
| 104602 | 30, 40 | 20, 20 | $2^{-10}, 2^{-4}$ | 0.76, 0.79 | 0.55, 0.66 |
| 109502 | 10 | 10 | $2^{-10}$ | 0.37 | 0.79 |
| 112802 | 10, 40, 25 | 10, 30, 40 | $2^{2}, 2^{-6}, 2^{-4}$ | 0.43, 0.35, 0.51 | 0.56, 0.73, 0.41 |
| 113902 | 50, 10, 50 | 40, 30, 10 | $2^{6}, 2^{-4}, 2^{8}$ | 0.44, 0.72, 0.73 | 0.52, 0.71, 0.56 |
| 114702 | 35, 15, 15, 50, 15 | 30, 40, 40, 10, 30 | $2^{-10}, 2^{-4}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.22, 0.17, 0.67, 0.41, 0.56 | 0.76, 0.93, 0.7, 0.53, 0.74 |
| 114902 | 25, 50, 15, 20 | 20, 30, 10, 10 | $2^{-4}, 2^{2}, 2^{-10}, 2^{-10}$ | 0.67, 0.05, 0.25, 0.75 | 0.44, 0.81, 0.93, 0.73 |
| 123902 | 40, 10 | 40, 10 | $2^{-10}, 2^{-10}$ | 0.80, 0.33 | 0.77, 0.9 |
| Overall | - | - | - | $0.53 \pm 0.19$ | $0.70 \pm 0.15$ |

**Table 9.** Training parameters and performance obtained for each patient with the Seizure-batch Regression and the Add-One-Forget-One data partitioning and iterative retraining method.

**Add-One-Forget-One - Seizure-batch Regression**

| Patient | SOP | k | C | $SS_{sample}$ | $SP_{sample}$ |
|---|---|---|---|---|---|
| 402 | 10, 10 | 10, 10 | $2^{-10}$,$2^{-4}$ | 0.52, 0.25 | 0.78, 0.53 |
| 8902 | 25, 30 | 10, 10 | $2^{-10}$,$2^{-10}$ | 0.77, 0.91 | 0.76, 0.85 |
| 11002 | 10 | 20 | $2^{-10}$ | 0.42 | 0.71 |
| 16202 | 40, 10, 15, 30 | 30, 30, 10, 40 | $2^{-10}$,$2^{-4}$,$2^{-8}$,$2^{-6}$ | 0.65, 0.22, 0.15, 0.14 | 0.76, 0.85, 0.81, 0.81 |
| 21902 | 50 | 20 | $2^{2}$ | 0.68 | 0.7 |
| 23902 | 50, 10 | 40, 40 | $2^{-10}$,$2^{-10}$ | 0.37, 0.55 | 0.62, 0.67 |
| 26102 | 50 | 40 | $2^{6}$ | 0.26 | 0.74 |
| 30802 | 35, 15, 20, 50, 50 | 40, 40, 30, 10, 10 | $2^{-8}$,$2^{-4}$,$2^{-8}$,$2^{-10}$,$2^{-10}$ | 0.66, 0.31, 0.56, 0.54, 0.65 | 0.85, 0.9, 0.56, 0.77, 0.64 |
| 32702 | 15, 25 | 10, 20 | $2^{-10}$,$2^{-10}$ | 0.57, 0.61 | 0.74, 0.71 |
| 45402 | 15 | 10 | $2^{-2}$ | 0.36 | 0.76 |
| 46702 | 40, 10 | 30, 10 | $2^{-4}$,$2^{-10}$ | 05, 0.44 | 0.87, 0.82 |
| 50802 | 15, 25 | 30, 20 | $2^{-8}$,$2^{-10}$ | 0.7, 0.39 | 0.86, 0.9 |
| 53402 | 30 | 30 | $2^{8}$ | 0.26 | 0.76 |
| 55202 | 10, 10, 10, 10, 50 | 10, 10, 10, 10, 10 | $2^{-10}$,$2^{-10}$,$2^{-10}$,$2^{-10}$,$2^{-8}$ | 0.73, 0.49, 0.52, 0.62, 0.55 | 0.55, 0.9, 0.6, 0.6, 0.51 |
| 56402 | 25 | 10 | $2^{-8}$ | 0.41 | 0.74 |
| 58602 | 10, 10, 20 | 10, 40, 40 | $2^{4}$,$2^{-4}$,$2^{-10}$ | 0.16, 0.2, 0.36 | 0.92, 0.95, 0.8 |
| 59102 | 50, 15 | 40, 40 | $2^{4}$,$2^{-2}$ | 0.38, 0.54 | 0.42, 0.32 |
| 60002 | 20, 20, 40 | 10, 10, 40 | $2^{-8}$,$2^{-8}$,$2^{-10}$ | 0.44, 0.26, 0.44 | 0.77, 0.77, 0.83 |
| 64702 | 40, 25 | 30, 40 | $2^{-10}$,$2^{-10}$ | 0.44, 0.43 | 0.67, 0.79 |
| 75202 | 30, 10, 50, 50 | 30, 20, 30, 10 | $2^{-10}$,$2^{-10}$,$2^{-10}$,$2^{-8}$ | 0.74, 0.6, 0.51, 0.84 | 0.83, 0.87, 0.83, 0.43 |
| 80702 | 35, 50, 15 | 40, 40, 30 | $2^{-10}$,$2^{-8}$,$2^{-10}$ | 0.3, 0.63, 0.53 | 0.79, 0.55, 0.51 |
| 85202 | 10, 15 | 20, 10 | $2^{-10}$,$2^{-10}$ | 0.26, 0.5 | 0.85, 0.63 |
| 93402 | 20, 15 | 10, 10 | $2^{0}$,$2^{8}$ | 0.4, 0.46 | 0.66, 0.53 |
| 93902 | 50, 50, 15 | 10, 20, 20 | $2^{-10}$,$2^{-10}$,$2^{-8}$ | 0.56, 0.45, 0.43 | 0.62, 0.84, 0.75 |
| 94402 | 10, 35, 30, 10 | 10, 20, 20, 30 | $2^{8}$,$2^{-8}$,$2^{8}$,$2^{-2}$ | 0.42, 0.5, 0.36, 0.27 | 0.56, 0.55, 0.69, 0.95 |
| 95202 | 10, 40, 45, 25 | 10, 40, 30, 30 | $2^{-10}$,$2^{8}$,$2^{6}$,$2^{-10}$ | 0.51, 0.36, 0.33, 0.66 | 0.65, 0.67, 0.56, 0.67 |
| 96002 | 25, 40, 35, 45 | 20, 30, 40, 20 | $2^{-2}$,$2^{-6}$,$2^{-6}$,$2^{8}$ | 0.52, 0.29, 0.61, 0.39 | 0.7, 0.63, 0.73, 0.86 |
| 98102 | 25, 35 | 20, 30 | $2^{-4}$,$2^{-2}$ | 0.31, 0.53 | 0.57, 0.7 |
| 101702 | 35, 50 | 20, 40 | $2^{-2}$,$2^{-8}$ | 0.4, 0.29 | 0.62, 0.77 |
| 102202 | 50, 45, 50, 50 | 30, 40, 30, 10 | $2^{-6}$,$2^{-4}$,$2^{-2}$,$2^{-6}$ | 06, 0.32, 0.27, 09 | 0.97, 0.48, 0.48, 0.75 |
| 104602 | 25, 45 | 10, 30 | $2^{-8}$,$2^{-10}$ | 0.38, 0.75 | 0.68, 0.67 |
| 109502 | 20 | 10 | $2^{-10}$ | 0.35 | 0.57 |
| 112802 | 10, 15, 15 | 10, 10, 40 | $2^{-10}$,$2^{-6}$,$2^{-10}$ | 0.65, 0.38, 0.19 | 0.49, 0.58, 0.79 |
| 113902 | 50, 10, 40 | 20, 40, 20 | $2^{-10}$,$2^{-6}$,$2^{-2}$ | 0.13, 0.29, 0.42 | 0.77, 0.89, 0.66 |
| 114702 | 40, 30, 15, 45, 50 | 20, 20, 40, 10, 40 | $2^{8}$,$2^{-8}$,$2^{-8}$,$2^{-10}$,$2^{-10}$ | 0.27, 04, 0.28, 0.52, 0.75 | 0.62, 0.84, 0.86, 0.55, 0.63 |
| 114902 | 25, 50, 50, 20 | 20, 30, 10, 10 | $2^{0}$,$2^{8}$,$2^{-10}$,$2^{-10}$ | 0.53, 04, 0.15, 0.67 | 0.44, 0.77, 0.91, 0.84 |
| 123902 | 50, 35 | 10, 20 | $2^{-8}$,$2^{-10}$ | 0.57, 0.2 | 0.83, 0.9 |
| Overall | - | - | - | 0.43 ± 0.20 | 0.71 ± 0.14 |

**Table 10.** Training parameters and performance obtained for each patient with the Dynamic Weighted Ensemble and the Add-One-Forget-One data partitioning and iterative retraining method.

**Add-One-Forget-One - Dynamic Weighted Ensemble**

| Patient | SOP | k | C | $SS_{sample}$ | $SP_{sample}$ |
|---|---|---|---|---|---|
| 402 | 10, 15 | 10, 10 | $2^{-10}, 2^{8}$ | 0.69, 0.19 | 0.65, 0.59 |
| 8902 | 15, 20 | 10, 10 | $2^{0}, 2^{6}$ | 0.90, 0.97 | 0.68, 0.78 |
| 11002 | 10 | 20 | $2^{-10}$ | 0.53 | 0.61 |
| 16202 | 45, 15, 10, 30 | 10, 40, 20, 40 | $2^{-10}, 2^{8}, 2^{8}, 2^{6}$ | 0.83, 0.55, 0.46, 0.21 | 0.61, 0.59, 0.69, 0.71 |
| 21902 | 40 | 40 | $2^{-10}$ | 0.84 | 0.58 |
| 23902 | 50, 10 | 40, 30 | $2^{-8}, 2^{0}$ | 0.50, 0.63 | 0.53, 0.53 |
| 26102 | 50 | 40 | $2^{6}$ | 0.66 | 0.35 |
| 30802 | 35, 15, 20, 25, 50 | 40, 10, 20, 30, 10 | $2^{-8}, 2^{-10}, 2^{0}, 2^{-10}, 2^{-10}$ | 0.92, 0.40, 0.53, 0.59, 0.74 | 0.78, 0.85, 0.56, 0.73, 0.46 |
| 32702 | 15, 20 | 10, 20 | $2^{-2}, 2^{-10}$ | 0.67, 0.86 | 0.70, 0.57 |
| 45402 | 50 | 40 | $2^{-10}$ | 0.67 | 0.55 |
| 46702 | 30, 10 | 40, 10 | $2^{-2}, 2^{4}$ | 0.37, 0.66 | 0.69, 0.75 |
| 50802 | 15, 20 | 30, 40 | $2^{-10}, 2^{-10}$ | 0.82, 0.75 | 0.70, 0.8 |
| 53402 | 15 | 20 | $2^{-4}$ | 0.22 | 0.72 |
| 55202 | 10, 10, 10, 10, 50 | 10, 10, 10, 20, 10 | $2^{-10}, 2^{-10}, 2^{-6}, 2^{-2}, 2^{-10}$ | 0.84, 0.63, 0.67, 0.71, 0.62 | 0.52, 0.83, 0.56, 0.56, 0.45 |
| 56402 | 25 | 20 | $2^{-10}$ | 0.46 | 0.72 |
| 58602 | 10, 10, 20 | 40, 40, 40 | $2^{-10}, 2^{-10}, 2^{-8}$ | 0.15, 0.17, 0.65 | 0.78, 0.87, 0.73 |
| 59102 | 50, 50 | 10, 10 | $2^{-10}, 2^{-10}$ | 0.41, 0.73 | 0.42, 0.14 |
| 60002 | 25, 25, 50 | 30, 10, 40 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.56, 0.40, 0.68 | 0.65, 0.67, 0.69 |
| 64702 | 50, 25 | 30, 30 | $2^{-6}, 2^{-6}$ | 0.64, 0.71 | 0.46, 0.55 |
| 75202 | 30, 10, 10, 10 | 30, 20, 40, 40 | $2^{-10}, 2^{-10}, 2^{-10}, 2^{2}$ | 0.82, 0.70, 0.84, 0.57 | 0.75, 0.81, 0.75, 0.57 |
| 80702 | 30, 30, 45 | 20, 20, 40 | $2^{-10}, 2^{-10}, 2^{-8}$ | 0.51, 0.67, 0.61 | 0.63, 0.40, 0.51 |
| 85202 | 10, 15 | 30, 20 | $2^{6}, 2^{8}$ | 0.25, 0.65 | 0.79, 0.53 |
| 93402 | 20, 15 | 10, 10 | $2^{-10}, 2^{2}$ | 0.64, 0.56 | 0.43, 0.37 |
| 93902 | 50, 50, 40 | 30, 30, 10 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.71, 0.69, 0.43 | 0.51, 0.72, 0.63 |
| 94402 | 10, 50, 25, 10 | 10, 10, 30, 40 | $2^{4}, 2^{-10}, 2^{-6}, 2^{-10}$ | 0.48, 0.82, 0.29, 0.49 | 0.62, 0.36, 0.71, 0.86 |
| 95202 | 10, 40, 35, 25 | 10, 40, 10, 10 | $2^{-10}, 2^{8}, 2^{-10}, 2^{-10}$ | 0.77, 0.48, 0.42, 0.74 | 0.43, 0.57, 0.50, 0.59 |
| 96002 | 10, 40, 50, 45 | 40, 30, 40, 20 | $2^{-10}, 2^{-2}, 2^{0}, 2^{-2}$ | 0.84, 0.55, 0.92, 0.55 | 0.56, 0.45, 0.64, 0.77 |
| 98102 | 25, 50 | 40, 20 | $2^{8}, 2^{-2}$ | 0.58, 0.63 | 0.32, 0.58 |
| 101702 | 10, 50 | 20, 30 | $2^{-6}, 2^{8}$ | 0.50, 0.40 | 0.57, 0.67 |
| 102202 | 45, 25, 50, 50 | 30, 40, 30, 20 | $2^{0}, 2^{2}, 2^{-2}, 2^{-6}$ | 0.12, 0.17, 0.4, 0.11 | 0.88, 0.66, 0.28, 0.73 |
| 104602 | 20, 30 | 10, 10 | $2^{-10}, 2^{-10}$ | 0.51, 0.80 | 0.58, 0.60 |
| 109502 | 30 | 10 | $2^{-6}$ | 0.34 | 0.71 |
| 112802 | 10, 10, 30 | 10, 30, 30 | $2^{-10}, 2^{-4}, 2^{8}$ | 0.77, 0.36, 0.26 | 0.37, 0.56, 0.71 |
| 113902 | 15, 15, 10 | 20, 30, 40 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.35, 0.60, 0.59 | 0.65, 0.76, 0.64 |
| 114702 | 50, 30, 10, 45, 50 | 30, 40, 20, 10, 40 | $2^{-8}, 2^{6}, 2^{6}, 2^{0}, 2^{-6}$ | 0.46, 0.17, 0.24, 0.6, 0.84 | 0.41, 0.66, 0.87, 0.51, 0.51 |
| 114902 | 25, 45, 35, 35 | 10, 30, 10, 40 | $2^{-10}, 2^{6}, 2^{-10}, 2^{-10}$ | 0.70, 03, 0.25, 0.85 | 0.23, 0.76, 0.89, 0.58 |
| 123902 | 10, 20 | 40, 10 | $2^{-6}, 2^{-4}$ | 0.92, 0.31 | 0.80, 0.88 |
| Overall | - | - | - | 0.56 ± 0.22 | 0.62 ± 0.15 |

**Table 11.** Testing parameters and performance obtained for each patient with the Backwards-Landmark Window and the Add-One-Forget-One data partitioning and iterative retraining method.

**Add-One-Forget-One - Backwards-Landmark Window**

| Patient | Evaluated seizures | SOP | SS | FPR/h | SS Surrogate | p-value | Above chance |
|---|---|---|---|---|---|---|---|
| 402 | 2 | 40, 40 | 1.00 | 0.00 | 0.00 ± 0.00 | 0.00 | • |
| 8902 | 2 | 20, 30 | 0.00 | 0.19 | 0.10 ± 0.20 | 0.99 | |
| 11002 | 1 | 20 | 1.00 | 0.00 | 0.00 ± 0.00 | 0.00 | • |
| 16202 | 4 | 15, 25, 50, 10 | 1.00 | 1.82 | 0.28 ± 0.15 | 0.00 | • |
| 21902 | 1 | 40 | 1.00 | 1.23 | 0.33 ± 0.47 | 0.00 | • |
| 23902 | 2 | 50, 10 | 1.00 | 2.99 | 0.32 ± 0.35 | 0.00 | • |
| 26102 | 1 | 50 | 1.00 | 2.88 | 0.53 ± 0.50 | 0.00 | • |
| 30802 | 5 | 10, 10, 50, 25, 50 | 0.60 | 0.79 | 0.10 ± 0.14 | 0.00 | • |
| 32702 | 2 | 15, 15 | 1.00 | 1.90 | 0.22 ± 0.31 | 0.00 | • |
| 45402 | 1 | 50 | 1.00 | 0.23 | 0.17 ± 0.37 | 0.00 | • |
| 46702 | 2 | 30, 10 | 0.50 | 1.46 | 0.23 ± 0.25 | 0.00 | • |
| 50802 | 2 | 15, 25 | 1.00 | 0.96 | 0.15 ± 0.26 | 0.00 | • |
| 53402 | 1 | 45 | 1.00 | 0.03 | 0.03 ± 0.18 | 0.00 | • |
| 55202 | 5 | 35, 10, 25, 10, 10 | 0.80 | 0.34 | 0.11 ± 0.13 | 0.00 | • |
| 56402 | 1 | 15 | 0.00 | 4.77 | 0.23 ± 0.42 | 1.00 | |
| 58602 | 3 | 10, 10, 20 | 0.67 | 0.73 | 0.16 ± 0.21 | 0.00 | • |
| 59102 | 2 | 20, 15 | 1.00 | 0.17 | 0.05 ± 0.15 | 0.00 | • |
| 60002 | 3 | 20, 15, 35 | 1.00 | 1.30 | 0.27 ± 0.22 | 0.00 | • |
| 64702 | 2 | 50, 15 | 0.50 | 1.49 | 0.37 ± 0.34 | 0.02 | • |
| 75202 | 4 | 30, 10, 45, 35 | 0.75 | 0.23 | 0.27 ± 0.14 | 0.00 | • |
| 80702 | 3 | 10, 50, 50 | 1.00 | 0.91 | 0.36 ± 0.23 | 0.00 | • |
| 85202 | 2 | 10, 30 | 0.00 | 1.61 | 0.22 ± 0.28 | 1.00 | |
| 93402 | 2 | 15, 20 | 0.50 | 0.11 | 0.03 ± 0.12 | 0.00 | • |
| 93902 | 3 | 30, 45, 20 | 1.00 | 1.42 | 0.38 ± 0.24 | 0.00 | • |
| 94402 | 4 | 10, 20, 35, 15 | 0.75 | 0.12 | 0.03 ± 0.08 | 0.00 | • |
| 95202 | 4 | 10, 35, 40, 10 | 0.75 | 1.83 | 0.35 ± 0.22 | 0.00 | • |
| 96002 | 4 | 40, 20, 15, 50 | 0.75 | 0.73 | 0.16 ± 0.16 | 0.00 | • |
| 98102 | 2 | 25, 10 | 1.00 | 2.37 | 0.40 ± 0.24 | 0.00 | • |
| 101702 | 2 | 30, 50 | 1.00 | 0.64 | 0.32 ± 0.27 | 0.00 | • |
| 102202 | 4 | 10, 20, 10, 15 | 0.25 | 0.36 | 0.06 ± 0.11 | 0.00 | • |
| 104602 | 2 | 30, 40 | 1.00 | 0.81 | 0.33 ± 0.27 | 0.00 | • |
| 109502 | 1 | 10 | 0.00 | 0.47 | 0.07 ± 0.25 | 0.92 | |
| 112802 | 3 | 10, 40, 25 | 1.00 | 0.83 | 0.18 ± 0.22 | 0.00 | • |
| 113902 | 3 | 50, 10, 50 | 0.67 | 1.13 | 0.37 ± 0.20 | 0.00 | • |
| 114702 | 5 | 35, 15, 15, 50, 15 | 0.60 | 0.74 | 0.19 ± 0.17 | 0.00 | • |
| 114902 | 4 | 25, 50, 15, 20 | 1.00 | 0.22 | 0.17 ± 0.21 | 0.00 | • |
| 123902 | 2 | 40, 10 | 0.50 | 0.17 | 0.03 ± 0.12 | 0.00 | • |
| Overall | - | - | 0.75 ± 0.33 | 1.03 ± 1.00 | 0.22 ± 0.47 | - | 33 |

**Table 12.** Testing parameters and performance obtained for each patient with the Seizure-batch Regression and the Add-One-Forget-One data partitioning and iterative retraining method.

**Add-One-Forget-One - Seizure-batch Regression**

| Patient | Evaluated seizures | SOP | SS | FPR/h | SS Surrogate | p-value | Above chance |
|---|---|---|---|---|---|---|---|
| 402 | 2 | 10, 10 | 0.00 | 5.07 | 0.17 ± 0.24 | 1.00 | |
| 8902 | 2 | 25, 30 | 0.50 | 0.31 | 0.13 ± 0.22 | 0.00 | • |
| 11002 | 1 | 10 | 0.00 | 11.96 | 0.47 ± 0.50 | 1.00 | |
| 16202 | 4 | 40, 10, 15, 30 | 0.25 | 0.61 | 0.13 ± 0.15 | 0.00 | • |
| 21902 | 1 | 50 | 1.00 | 0.19 | 0.13 ± 0.34 | 0.00 | • |
| 23902 | 2 | 50, 10 | 1.00 | 0.67 | 0.10 ± 0.24 | 0.00 | • |
| 26102 | 1 | 50 | 1.00 | 0.05 | 0.03 ± 0.18 | 0.00 | • |
| 30802 | 5 | 35, 15, 20, 50, 50 | 0.60 | 0.49 | 0.23 ± 0.17 | 0.00 | • |
| 32702 | 2 | 15, 25 | 1.00 | 1.81 | 0.30 ± 0.33 | 0.00 | • |
| 45402 | 1 | 15 | 1.00 | 97.86 | 0.60 ± 0.49 | 0.00 | • |
| 46702 | 2 | 40, 10 | 0.50 | 0.61 | 0.12 ± 0.25 | 0.00 | • |
| 50802 | 2 | 15, 25 | 1.00 | 0.41 | 0.03 ± 0.12 | 0.00 | • |
| 53402 | 1 | 30 | 1.00 | 0.03 | 0.00 ± 0.00 | 0.00 | • |
| 55202 | 5 | 10, 10, 10, 10, 50 | 0.60 | 1.20 | 0.23 ± 0.19 | 0.00 | • |
| 56402 | 1 | 25 | 1.00 | 1.55 | 0.30 ± 0.46 | 0.00 | • |
| 58602 | 3 | 10, 10, 20 | 0.33 | 0.49 | 0.13 ± 0.16 | 0.00 | • |
| 59102 | 2 | 50, 15 | 1.00 | 1.47 | 0.20 ± 0.28 | 0.00 | • |
| 60002 | 3 | 20, 20, 40 | 0.67 | 0.85 | 0.21 ± 0.20 | 0.00 | • |
| 64702 | 2 | 40, 25 | 0.50 | 0.66 | 0.27 ± 0.28 | 0.00 | • |
| 75202 | 4 | 30, 10, 50, 50 | 0.50 | 0.40 | 0.34 ± 0.14 | 0.00 | • |
| 80702 | 3 | 35, 50, 15 | 0.67 | 1.08 | 0.27 ± 0.22 | 0.00 | • |
| 85202 | 2 | 10, 15 | 1.00 | 0.88 | 0.20 ± 0.24 | 0.00 | • |
| 93402 | 2 | 20, 15 | 0.50 | 1.55 | 0.37 ± 0.31 | 0.01 | • |
| 93902 | 3 | 50, 50, 15 | 0.67 | 1.85 | 0.26 ± 0.27 | 0.00 | • |
| 94402 | 4 | 10, 35, 30, 10 | 0.25 | 0.83 | 0.21 ± 0.17 | 0.10 | |
| 95202 | 4 | 10, 40, 45, 25 | 0.75 | 0.42 | 0.12 ± 0.12 | 0.00 | • |
| 96002 | 4 | 25, 40, 35, 45 | 0.50 | 0.26 | 0.13 ± 0.14 | 0.00 | • |
| 98102 | 2 | 25, 35 | 0.50 | 0.50 | 0.12 ± 0.25 | 0.00 | • |
| 101702 | 2 | 35, 50 | 1.00 | 0.34 | 0.32 ± 0.27 | 0.00 | • |
| 102202 | 4 | 50, 45, 50, 50 | 0.75 | 0.22 | 0.07 ± 0.14 | 0.00 | • |
| 104602 | 2 | 25, 45 | 1.00 | 0.38 | 0.23 ± 0.31 | 0.00 | • |
| 109502 | 1 | 20 | 0.00 | 0.00 | 0.00 ± 0.00 | - | |
| 112802 | 3 | 10, 15, 15 | 0.67 | 1.15 | 0.18 ± 0.22 | 0.00 | • |
| 113902 | 3 | 50, 10, 40 | 0.33 | 0.55 | 0.21 ± 0.22 | 0.00 | • |
| 114702 | 5 | 40, 30, 15, 45, 50 | 0.60 | 0.62 | 0.33 ± 0.17 | 0.00 | • |
| 114902 | 4 | 25, 50, 50, 20 | 0.50 | 0.37 | 0.16 ± 0.18 | 0.00 | • |
| 123902 | 2 | 50, 35 | 0.50 | 0.18 | 0.08 ± 0.19 | 0.00 | • |
| Overall | - | - | 0.64 ± 0.31 | 3.73 ± 15.82 | 0.23 ± 0.48 | - | 32 |

Even though the sensitivity was above the one from the Surrogate, it was not considered as statistically validated as the FPR/h is extremely large (•).

**Table 13.** Testing parameters and performance obtained for each patient with the Dynamic Weighted Ensemble and the Add-One-Forget-One data partitioning and iterative retraining method.

**Add-One-Forget-One - Dynamic Weighted Ensemble**

| Patient | Evaluated seizures | SOP | SS | FPR/h | SS Surrogate | p-value | Above chance |
|---|---|---|---|---|---|---|---|
| 402 | 2 | 10, 15 | 1.00 | 2.77 | 0.25 ± 0.28 | 0.00 | • |
| 8902 | 2 | 15, 20 | 1.00 | 0.55 | 0.17 ± 0.24 | 0.00 | • |
| 11002 | 1 | 10 | 0.00 | 14.37 | 0.43 ± 0.50 | 1.00 | |
| 16202 | 4 | 45, 15, 10, 30 | 0.75 | 0.52 | 0.15 ± 0.15 | 0.00 | • |
| 21902 | 1 | 40 | 0.00 | 1.50 | 0.37 ± 0.48 | 1.00 | |
| 23902 | 2 | 50, 10 | 1.00 | 1.39 | 0.28 ± 0.28 | 0.00 | • |
| 26102 | 1 | 50 | 1.00 | 0.88 | 0.33 ± 0.47 | 0.00 | • |
| 30802 | 5 | 35, 15, 20, 25, 50 | 0.80 | 0.52 | 0.19 ± 0.21 | 0.00 | • |
| 32702 | 2 | 15, 20 | 1.00 | 1.80 | 0.20 ± 0.28 | 0.00 | • |
| 45402 | 1 | 50 | 1.00 | 0.00 | 0.00 ± 0.00 | 0.00 | • |
| 46702 | 2 | 30, 10 | 0.00 | 0.88 | 0.13 ± 0.26 | 1.00 | |
| 50802 | 2 | 15, 20 | 1.00 | 1.27 | 0.12 ± 0.21 | 0.00 | • |
| 53402 | 1 | 15 | 1.00 | 2.03 | 0.20 ± 0.40 | 0.00 | • |
| 55202 | 5 | 10, 10, 10, 10, 50 | 1.00 | 1.67 | 0.32 ± 0.15 | 0.00 | • |
| 56402 | 1 | 25 | 1.00 | 3.30 | 0.50 ± 0.50 | 0.00 | • |
| 58602 | 3 | 10, 10, 20 | 0.67 | 0.63 | 0.16 ± 0.19 | 0.00 | • |
| 59102 | 2 | 50, 50 | 1.00 | 1.21 | 0.43 ± 0.33 | 0.00 | • |
| 60002 | 3 | 25, 25, 50 | 1.00 | 1.06 | 0.27 ± 0.18 | 0.00 | • |
| 64702 | 2 | 50, 25 | 1.00 | 2.00 | 0.53 ± 0.36 | 0.00 | • |
| 75202 | 4 | 30, 10, 10, 10 | 0.50 | 0.98 | 0.23 ± 0.21 | 0.00 | • |
| 80702 | 3 | 30, 30, 45 | 1.00 | 1.19 | 0.52 ± 0.24 | 0.00 | • |
| 85202 | 2 | 10, 15 | 0.50 | 1.16 | 0.17 ± 0.27 | 0.00 | • |
| 93402 | 2 | 20, 15 | 0.50 | 1.16 | 0.35 ± 0.29 | 0.00 | • |
| 93902 | 3 | 50, 50, 40 | 0.67 | 2.54 | 0.53 ± 0.22 | 0.00 | • |
| 94402 | 4 | 10, 50, 25, 10 | 0.75 | 0.86 | 0.23 ± 0.13 | 0.00 | • |
| 95202 | 4 | 10, 40, 35, 25 | 1.00 | 1.21 | 0.36 ± 0.26 | 0.00 | • |
| 96002 | 4 | 10, 40, 50, 45 | 0.75 | 0.58 | 0.30 ± 0.18 | 0.00 | • |
| 98102 | 2 | 25, 50 | 1.00 | 0.96 | 0.25 ± 0.31 | 0.00 | • |
| 101702 | 2 | 10, 50 | 0.50 | 1.84 | 0.33 ± 0.3 | 0.00 | • |
| 102202 | 4 | 45, 25, 50, 50 | 0.50 | 0.18 | 0.08 ± 0.11 | 0.00 | • |
| 104602 | 2 | 20, 30 | 0.00 | 1.74 | 0.37 ± 0.41 | 1.00 | |
| 109502 | 1 | 30 | 0.00 | 0.00 | 0.00 ± 0.00 | - | |
| 112802 | 3 | 10, 10, 30 | 0.33 | 2.89 | 0.28 ± 0.23 | 0.10 | |
| 113902 | 3 | 15, 15, 10 | 0.67 | 1.31 | 0.22 ± 0.22 | 0.00 | • |
| 114702 | 5 | 50, 30, 10, 45, 50 | 0.60 | 0.52 | 0.26 ± 0.13 | 0.00 | • |
| 114902 | 4 | 25, 45, 35, 35 | 1.00 | 0.59 | 0.31 ± 0.19 | 0.00 | • |
| 123902 | 2 | 10, 20 | 0.00 | 0.98 | 0.05 ± 0.15 | 0.96 | • |
| Overall | - | - | 0.69 ± 0.36 | 1.60 ± 2.26 | 0.25 ± 0.50 | - | 31 |

**Table 14.** Training parameters and performance obtained for each patient with the Backwards-Landmark Window and the Chronological Accumulation data partitioning and iterative retraining method.

**Chronological Accumulation - Backwards-Landmark Window**

| Patient | SOP | k | C | $SS_{sample}$ | $SP_{sample}$ |
|---|---|---|---|---|---|
| 402 | 40, 20 | 10, 30 | $2^{-10}, 2^{0}$ | 0.53, 0.42 | 0.62, 0.65 |
| 8902 | 20, 30 | 10, 10 | $2^{-10}, 2^{0}$ | 0.82, 0.97 | 0.78, 0.78 |
| 11002 | 10 | 20 | $2^{-10}$ | 0.42 | 0.71 |
| 16202 | 15, 10, 50, 20 | 30, 30, 10, 30 | $2^{0}, 2^{0}, 2^{-10}, 2^{0}$ | 0.63, 0.42, 0.52, 0.24 | 0.82, 0.73, 0.79, 0.71 |
| 21902 | 40 | 10 | $2^{6}$ | 0.71 | 0.73 |
| 23902 | 50, 10 | 40, 40 | $2^{-10}, 2^{-10}$ | 0.37, 0.55 | 0.62, 0.67 |
| 26102 | 50 | 30 | $2^{0}$ | 0.31 | 0.59 |
| 30802 | 10, 10, 50, 25, 50 | 40, 10, 40, 20, 40 | $2^{-10}, 2^{-10}, 2^{2}, 2^{-10}, 2^{-10}$ | 0.59, 0.26, 0.45, 0.59, 0.65 | 0.84, 0.86, 0.53, 0.70, 0.63 |
| 32702 | 15, 25 | 10, 20 | $2^{-10}, 2^{-10}$ | 0.57, 0.61 | 0.74, 0.71 |
| 45402 | 15 | 30 | $2^{-10}$ | 0.72 | 0.53 |
| 46702 | 30, 10 | 20, 10 | $2^{-8}, 2^{-10}$ | 0.37, 0.51 | 0.76, 0.85 |
| 50802 | 15, 25 | 30, 20 | $2^{-8}, 2^{-10}$ | 0.70, 0.39 | 0.86, 0.90 |
| 53402 | 40 | 10 | $2^{-10}$ | 0.47 | 0.65 |
| 55202 | 35, 10, 25, 10, 10 | 10, 20, 30, 10, 30 | $2^{-6}, 2^{-10}, 2^{2}, 2^{-10}, 2^{-6}$ | 0.62, 0.51, 0.60, 0.94, 0.53 | 0.53, 0.72, 0.56, 0.67, 0.69 |
| 56402 | 25 | 10 | $2^{-8}$ | 0.41 | 0.74 |
| 58602 | 10, 10, 10 | 10, 30, 30 | $2^{0}, 2^{0}, 2^{0}$ | 0.24, 0.33, 0.53 | 0.71, 0.79, 0.75 |
| 59102 | 20, 15 | 20, 40 | $2^{-10}, 2^{-4}$ | 0.48, 0.48 | 0.59, 0.37 |
| 60002 | 20, 20, 40 | 10, 10, 40 | $2^{-8}, 2^{-8}, 2^{-10}$ | 0.44, 0.26, 0.44 | 0.77, 0.77, 0.83 |
| 64702 | 30, 20 | 30, 10 | $2^{-10}, 2^{-10}$ | 0.42, 0.80 | 0.68, 0.67 |
| 75202 | 30, 10, 45, 35 | 10, 10, 10, 30 | $2^{-4}, 2^{-10}, 2^{-10}, 2^{-4}$ | 0.68, 0.53, 0.31, 0.56 | 0.85, 0.83, 0.85, 0.49 |
| 80702 | 35, 50, 15 | 40, 40, 30 | $2^{-10}, 2^{-8}, 2^{-10}$ | 0.3, 0.63, 0.53 | 0.79, 0.55, 0.51 |
| 85202 | 15, 40 | 30, 10 | $2^{0}, 2^{0}$ | 0.45, 0.63 | 0.66, 0.67 |
| 93402 | 15, 20 | 20, 40 | $2^{4}, 2^{-6}$ | 0.45, 0.67 | 0.71, 0.71 |
| 93902 | 50, 50, 15 | 10, 20, 20 | $2^{-10}, 2^{-10}, 2^{-8}$ | 0.56, 0.45, 0.43 | 0.62, 0.84, 0.75 |
| 94402 | 10, 40, 15, 15 | 30, 30, 30, 10 | $2^{0}, 2^{0}, 2^{0}, 2^{-10}$ | 0.41, 0.23, 0.13, 0.54 | 0.63, 0.64, 0.77, 0.84 |
| 95202 | 10, 35, 40, 10 | 10, 30, 40, 10 | $2^{-10}, 2^{4}, 2^{0}, 2^{-10}$ | 0.82, 0.35, 0.39, 0.76 | 0.57, 0.66, 0.68, 0.9 |
| 96002 | 25, 40, 35, 45 | 20, 30, 40, 20 | $2^{-2}, 2^{-6}, 2^{-6}, 2^{8}$ | 0.52, 0.29, 0.61, 0.39 | 0.70, 0.63, 0.73, 0.86 |
| 98102 | 35, 45 | 10, 10 | $2^{0}, 2^{-10}$ | 0.51, 0.60 | 0.52, 0.68 |
| 101702 | 30, 50 | 30, 40 | $2^{-4}, 2^{-2}$ | 0.63, 0.70 | 0.51, 0.58 |
| 102202 | 50, 45, 50, 50 | 30, 40, 30, 10 | $2^{-6}, 2^{-4}, 2^{-2}, 2^{-6}$ | 0.06, 0.32, 0.27, 0.09 | 0.97, 0.48, 0.48, 0.75 |
| 104602 | 25, 50 | 10, 30 | $2^{-10}, 2^{0}$ | 0.43, 0.60 | 0.62, 0.67 |
| 109502 | 10 | 10 | $2^{-10}$ | 0.37 | 0.79 |
| 112802 | 10, 15, 15 | 10, 10, 40 | $2^{-10}, 2^{-6}, 2^{-10}$ | 0.65, 0.38, 0.19 | 0.49, 0.58, 0.79 |
| 113902 | 45, 15, 45 | 30, 30, 10 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.42, 0.64, 0.46 | 0.56, 0.73, 0.61 |
| 114702 | 35, 15, 15, 50, 15 | 30, 40, 40, 10, 30 | $2^{-10}, 2^{-4}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.22, 0.17, 0.67, 0.41, 0.56 | 0.76, 0.93, 0.70, 0.53, 0.74 |
| 114902 | 25, 50, 50, 20 | 20, 30, 10, 10 | $2^{0}, 2^{8}, 2^{-10}, 2^{-10}$ | 0.53, 0.04, 0.15, 0.67 | 0.44, 0.77, 0.91, 0.84 |
| 123902 | 10, 10 | 30, 30 | $2^{-10}, 2^{-10}$ | 0.79, 0.65 | 0.84, 0.83 |
| Overall | - | - | - | 0.49 ± 0.19 | 0.70 ± 0.12 |

**Table 15.** Training parameters and performance obtained for each patient with the Seizure-batch Regression and the Chronological Accumulation data partitioning and iterative retraining method.

**Chronological Accumulation - Seizure-batch Regression**

| Patient | SOP | k | C | $SS_{sample}$ | $SP_{sample}$ |
|---|---|---|---|---|---|
| 402 | 10, 15 | 10, 10 | $2^{-10}, 2^{8}$ | 0.69, 0.19 | 0.65, 0.59 |
| 8902 | 20, 20 | 30, 30 | $2^{-10}, 2^{-10}$ | 0.87, 0.91 | 0.84, 0.85 |
| 11002 | 10 | 20 | $2^{-10}$ | 0.53 | 0.61 |
| 16202 | 45, 15, 10, 30 | 10, 40, 20, 40 | $2^{-10}, 2^{8}, 2^{8}, 2^{6}$ | 0.83, 0.55, 0.46, 0.21 | 0.61, 0.59, 0.69, 0.71 |
| 21902 | 10 | 10 | $2^{-10}$ | 0.67 | 0.61 |
| 23902 | 50, 45 | 40, 10 | $2^{-8}, 2^{-10}$ | 0.50, 0.66 | 0.53, 0.44 |
| 26102 | 50 | 40 | $2^{6}$ | 0.66 | 0.35 |
| 30802 | 50, 50, 50, 35, 35 | 30, 10, 10, 10, 10 | $2^{-10}, 2^{0}, 2^{-10}, 2^{0}, 2^{-10}$ | 0.90, 0.72, 0.76, 0.79, 0.79 | 0.79, 0.78, 0.65, 0.66, 0.59 |
| 32702 | 15, 15 | 10, 10 | $2^{-2}, 2^{-10}$ | 0.67, 0.81 | 0.70, 0.63 |
| 45402 | 50 | 40 | $2^{-10}$ | 0.67 | 0.55 |
| 46702 | 35, 25 | 30, 30 | $2^{0}, 2^{0}$ | 0.20, 0.49 | 0.68, 0.63 |
| 50802 | 15, 20 | 30, 30 | $2^{-10}, 2^{-10}$ | 0.82, 0.73 | 0.70, 0.8 |
| 53402 | 15 | 20 | $2^{-4}$ | 0.22 | 0.72 |
| 55202 | 10, 10, 10, 10, 10 | 30, 10, 30, 30, 30 | $2^{0}, 2^{-10}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.50, 0.74, 0.69, 0.67, 0.71 | 0.73, 0.67, 0.55, 0.64, 0.61 |
| 56402 | 25 | 20 | $2^{-10}$ | 0.46 | 0.72 |
| 58602 | 10, 10, 20 | 40, 40, 40 | $2^{-10}, 2^{-10}, 2^{-8}$ | 0.15, 0.17, 0.65 | 0.78, 0.87, 0.73 |
| 59102 | 15, 50 | 10, 30 | $2^{-10}, 2^{0}$ | 0.66, 0.52 | 0.44, 0.43 |
| 60002 | 25, 15, 15 | 30, 20, 20 | $2^{-10}, 2^{-10}, 2^{-8}$ | 0.56, 0.44, 0.44 | 0.65, 0.66, 0.7 |
| 64702 | 50, 25 | 30, 30 | $2^{-6}, 2^{-6}$ | 0.64, 0.71 | 0.46, 0.55 |
| 75202 | 30, 10, 30, 40 | 30, 10, 30, 10 | $2^{-10}, 2^{-10}, 2^{0}, 2^{-10}$ | 0.71, 0.73, 0.69, 0.68 | 0.83, 0.82, 0.62, 0.61 |
| 80702 | 30, 30, 50 | 20, 10, 30 | $2^{-10}, 2^{-10}, 2^{-6}$ | 0.51, 0.63, 0.61 | 0.63, 0.45, 0.43 |
| 85202 | 10, 15 | 30, 20 | $2^{6}, 2^{8}$ | 0.25, 0.65 | 0.79, 0.53 |
| 93402 | 50, 20 | 10, 30 | $2^{-10}, 2^{0}$ | 0.57, 0.44 | 0.52, 0.75 |
| 93902 | 50, 50, 40 | 30, 30, 10 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.71, 0.75, 0.46 | 0.51, 0.61, 0.68 |
| 94402 | 10, 50, 25, 10 | 10, 10, 30, 40 | $2^{4}, 2^{-10}, 2^{-6}, 2^{-10}$ | 0.48, 0.82, 0.29, 0.49 | 0.62, 0.36, 0.71, 0.86 |
| 95202 | 10, 30, 10, 40 | 10, 30, 10, 30 | $2^{-10}, 2^{0}, 2^{-10}, 2^{0}$ | 0.74, 0.28, 0.68, 0.55 | 0.66, 0.62, 0.66, 0.55 |
| 96002 | 10, 20, 30, 30 | 40, 40, 30, 30 | $2^{-10}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.84, 0.46, 0.58, 0.56 | 0.56, 0.67, 0.57, 0.60 |
| 98102 | 25, 50 | 40, 20 | $2^{8}, 2^{-2}$ | 0.58, 0.63 | 0.32, 0.58 |
| 101702 | 10, 40 | 10, 10 | $2^{0}, 2^{0}$ | 0.49, 0.60 | 0.60, 0.51 |
| 102202 | 45, 25, 50, 50 | 30, 40, 30, 10 | $2^{0}, 2^{6}, 2^{4}, 2^{4}$ | 0.12, 0.25, 0.35, 0.24 | 0.88, 0.78, 0.59, 0.72 |
| 104602 | 20, 30 | 10, 10 | $2^{-10}, 2^{-10}$ | 0.51, 0.8 | 0.58, 0.60 |
| 109502 | 10 | 10 | $2^{-10}$ | 0.56 | 0.54 |
| 112802 | 10, 15, 15 | 10, 10, 10 | $2^{-10}, 2^{8}, 2^{8}$ | 0.77, 0.49, 0.42 | 0.37, 0.42, 0.5 |
| 113902 | 15, 15, 10 | 20, 30, 40 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.35, 0.60, 0.59 | 0.65, 0.76, 0.64 |
| 114702 | 35, 45, 10, 15, 15 | 10, 10, 30, 30, 10 | $2^{0}, 2^{0}, 2^{0}, 2^{0}, 2^{0}$ | 0.25, 0.36, 0.44, 0.4, 0.57 | 0.73, 0.55, 0.63, 0.63, 0.53 |
| 114902 | 25, 35, 35, 35 | 10, 10, 10, 40 | $2^{-10}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.70, 0.31, 0.31, 0.57 | 0.23, 0.60, 0.71, 0.66 |
| 123902 | 10, 20 | 40, 10 | $2^{-6}, 2^{-4}$ | 0.92, 0.31 | 0.80, 0.88 |
| Overall | - | - | - | 0.56 ± 0.19 | 0.63 ± 0.13 |

**Table 16.** Training parameters and performance obtained for each patient with the Dynamic Weighted Ensemble and the Chronological Accumulation data partitioning and iterative retraining method.

**Chronological Accumulation - Dynamic Weighted Ensemble**

| Patient | SOP | k | C | $SS_{sample}$ | $SP_{sample}$ |
|---|---|---|---|---|---|
| 402 | 10, 50 | 10, 40 | $2^{-10}, 2^{6}$ | 0.69, 0.32 | 0.65, 0.68 |
| 8902 | 15, 20 | 10, 10 | $2^{0}, 2^{4}$ | 0.90, 0.95 | 0.68, 0.80 |
| 11002 | 10 | 20 | $2^{-10}$ | 0.53 | 0.61 |
| 16202 | 45, 15, 15, 50 | 10, 30, 30, 40 | $2^{-10}, 2^{2}, 2^{2}, 2^{6}$ | 0.83, 0.47, 0.43, 0.45 | 0.61, 0.70, 0.70, 0.69 |
| 21902 | 40 | 40 | $2^{-10}$ | 0.84 | 0.58 |
| 23902 | 50, 45 | 40, 10 | $2^{-8}, 2^{-10}$ | 0.50, 0.66 | 0.53, 0.44 |
| 26102 | 50 | 40 | $2^{6}$ | 0.66 | 0.35 |
| 30802 | 35, 10, 10, 25, 50 | 40, 20, 20, 40, 10 | $2^{-8}, 2^{-10}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.92, 0.58, 0.75, 0.65, 0.76 | 0.78, 0.83, 0.53, 0.68, 0.52 |
| 32702 | 15, 15 | 10, 10 | $2^{-2}, 2^{-10}$ | 0.67, 0.81 | 0.70, 0.63 |
| 45402 | 50 | 40 | $2^{-10}$ | 0.67 | 0.55 |
| 46702 | 30, 10 | 40, 40 | $2^{-2}, 2^{8}$ | 0.37, 0.59 | 0.69, 0.69 |
| 50802 | 15, 20 | 30, 30 | $2^{-10}, 2^{-10}$ | 0.82, 0.73 | 0.70, 0.8 |
| 53402 | 15 | 20 | $2^{-4}$ | 0.22 | 0.72 |
| 55202 | 10, 10, 10, 10, 10 | 10, 10, 10, 10, 10 | $2^{-10}, 2^{-10}, 2^{-10}, 2^{-10}, 2^{-8}$ | 0.84, 0.73, 0.70, 0.76, 0.75 | 0.52, 0.74, 0.56, 0.62, 0.57 |
| 56402 | 25 | 20 | $2^{-10}$ | 0.46 | 0.72 |
| 58602 | 10, 10, 20 | 40, 40, 30 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.15, 0.26, 0.33 | 0.78, 0.83, 0.76 |
| 59102 | 50, 45 | 10, 10 | $2^{-10}, 2^{-10}$ | 0.41, 0.70 | 0.42, 0.26 |
| 60002 | 25, 15, 15 | 30, 20, 20 | $2^{-10}, 2^{-10}, 2^{-8}$ | 0.56, 0.44, 0.44 | 0.65, 0.66, 0.70 |
| 64702 | 50, 25 | 30, 40 | $2^{-6}, 2^{-4}$ | 0.64, 0.64 | 0.46, 0.55 |
| 75202 | 30, 10, 50, 10 | 30, 20, 40, 40 | $2^{-10}, 2^{-10}, 2^{-8}, 2^{-6}$ | 0.82, 0.64, 0.68, 0.54 | 0.75, 0.82, 0.74, 0.69 |
| 80702 | 30, 30, 50 | 20, 10, 30 | $2^{-10}, 2^{-10}, 2^{-6}$ | 0.51, 0.63, 0.61 | 0.63, 0.45, 0.43 |
| 85202 | 10, 15 | 30, 40 | $2^{6}, 2^{2}$ | 0.25, 0.28 | 0.79, 0.76 |
| 93402 | 20, 15 | 10, 10 | $2^{-10}, 2^{8}$ | 0.64, 0.63 | 0.43, 0.48 |
| 93902 | 50, 50, 40 | 30, 30, 10 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.71, 0.75, 0.46 | 0.51, 0.61, 0.68 |
| 94402 | 10, 10, 10, 10 | 10, 40, 40, 40 | $2^{4}, 2^{-10}, 2^{-10}, 2^{-8}$ | 0.48, 0.71, 0.53, 0.57 | 0.62, 0.42, 0.51, 0.56 |
| 95202 | 10, 40, 40, 40 | 10, 40, 40, 40 | $2^{-10}, 2^{6}, 2^{2}, 2^{2}$ | 0.77, 0.56, 0.59, 0.68 | 0.43, 0.43, 0.36, 0.42 |
| 96002 | 10, 20, 30, 30 | 40, 40, 30, 30 | $2^{-10}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.84, 0.46, 0.58, 0.56 | 0.56, 0.67, 0.57, 0.6 |
| 98102 | 25, 50 | 40, 40 | $2^{8}, 2^{8}$ | 0.58, 0.69 | 0.32, 0.54 |
| 101702 | 10, 50 | 20, 30 | $2^{-6}, 2^{-6}$ | 0.50, 0.46 | 0.57, 0.55 |
| 102202 | 45, 25, 50, 50 | 30, 40, 30, 10 | $2^{0}, 2^{6}, 2^{4}, 2^{4}$ | 0.12, 0.25, 0.35, 0.24 | 0.88, 0.78, 0.59, 0.72 |
| 104602 | 20, 25 | 10, 10 | $2^{-10}, 2^{-10}$ | 0.51, 0.54 | 0.58, 0.61 |
| 109502 | 30 | 10 | $2^{-6}$ | 0.34 | 0.71 |
| 112802 | 10, 15, 15 | 10, 10, 10 | $2^{-10}, 2^{8}, 2^{8}$ | 0.77, 0.49, 0.42 | 0.37, 0.42, 0.5 |
| 113902 | 15, 15, 15 | 20, 20, 20 | $2^{-10}, 2^{-10}, 2^{-10}$ | 0.35, 0.44, 0.41 | 0.65, 0.75, 0.68 |
| 114702 | 50, 30, 30, 45, 50 | 30, 40, 40, 40, 40 | $2^{-8}, 2^{4}, 2^{-10}, 2^{4}, 2^{4}$ | 0.46, 0.24, 0.28, 0.36, 0.44 | 0.41, 0.61, 0.64, 0.61, 0.57 |
| 114902 | 25, 35, 35, 35 | 10, 10, 10, 40 | $2^{-10}, 2^{-10}, 2^{-10}, 2^{-10}$ | 0.7, 0.31, 0.31, 0.57 | 0.23, 0.6, 0.71, 0.66 |
| 123902 | 10, 10 | 40, 40 | $2^{-6}, 2^{-10}$ | 0.92, 0.46 | 0.80, 0.88 |
| Overall | - | - | - | 0.56 ± 0.19 | 0.61 ± 0.14 |

**Table 17.** Testing parameters and performance obtained for each patient with the Backwards-Landmark Window and the Chronological Accumulation data partitioning and iterative retraining method.

**Chronological Accumulation - Backwards-Landmark Window**

| Patient | Evaluated seizures | SOP | SS | FPR/h | SS Surrogate | p-value | Above chance |
|---|---|---|---|---|---|---|---|
| 402 | 2 | 40, 20 | 0.50 | 1.85 | 0.32 ± 0.24 | 0.00 | • |
| 8902 | 2 | 20, 30 | 0.50 | 0.19 | 0.12 ± 0.21 | 0.00 | • |
| 11002 | 1 | 10 | 1.00 | 0.00 | 0.00 ± 0.00 | 0.00 | • |
| 16202 | 4 | 15, 10, 50, 20 | 0.75 | 6.98 | 0.51 ± 0.21 | 0.00 | • |
| 21902 | 1 | 40 | 1.00 | 1.23 | 0.47 ± 0.50 | 0.00 | • |
| 23902 | 2 | 50, 10 | 1.00 | 2.74 | 0.58 ± 0.34 | 0.00 | • |
| 26102 | 1 | 50 | 1.00 | 2.88 | 0.67 ± 0.47 | 0.00 | • |
| 30802 | 5 | 10, 10, 50, 25, 50 | 0.20 | 1.51 | 0.27 ± 0.21 | 0.97 | |
| 32702 | 2 | 15, 25 | 0.50 | 1.67 | 0.17 ± 0.24 | 0.00 | • |
| 45402 | 1 | 15 | 1.00 | 0.23 | 0.13 ± 0.34 | 0.00 | • |
| 46702 | 2 | 30, 10 | 0.50 | 3.54 | 0.48 ± 0.38 | 0.41 | |
| 50802 | 2 | 15, 25 | 0.50 | 0.90 | 0.10 ± 0.24 | 0.00 | • |
| 53402 | 1 | 40 | 1.00 | 0.03 | 0.07 ± 0.25 | 0.00 | • |
| 55202 | 5 | 35, 10, 25, 10, 10 | 0.20 | 0.29 | 0.15 ± 0.14 | 0.02 | • |
| 56402 | 1 | 25 | 0.00 | 4.77 | 0.50 ± 0.50 | 1.00 | |
| 58602 | 3 | 10, 10, 10 | 0.33 | 0.71 | 0.06 ± 0.12 | 0.00 | • |
| 59102 | 2 | 20, 15 | 1.00 | 1.00 | 0.38 ± 0.21 | 0.00 | • |
| 60002 | 3 | 20, 20, 40 | 0.33 | 0.28 | 0.14 ± 0.21 | 0.00 | • |
| 64702 | 2 | 30, 20 | 0.50 | 0.52 | 0.35 ± 0.39 | 0.02 | • |
| 75202 | 4 | 30, 10, 45, 35 | 0.25 | 0.02 | 0.01 ± 0.04 | 0.00 | • |
| 80702 | 3 | 35, 50, 15 | 0.67 | 2.17 | 0.16 ± 0.17 | 0.00 | • |
| 85202 | 2 | 15, 40 | 0.50 | 9.62 | 0.37 ± 0.29 | 0.01 | • |
| 93402 | 2 | 15, 20 | 0.50 | 0.31 | 0.03 ± 0.12 | 0.00 | • |
| 93902 | 3 | 50, 50, 15 | 0.33 | 1.91 | 0.54 ± 0.25 | 1.00 | |
| 94402 | 4 | 10, 40, 15, 15 | 0.50 | 2.50 | 0.20 ± 0.22 | 0.00 | • |
| 95202 | 4 | 10, 35, 40, 10 | 0.25 | 1.10 | 0.18 ± 0.2 | 0.04 | • |
| 96002 | 4 | 25, 40, 35, 45 | 0.25 | 1.50 | 0.51 ± 0.19 | 1.00 | |
| 98102 | 2 | 35, 45 | 1.00 | 12.98 | 0.65 ± 0.37 | 0.00 | • |
| 101702 | 2 | 30, 50 | 0.50 | 0.07 | 0.05 ± 0.15 | 0.00 | • |
| 102202 | 4 | 50, 45, 50, 50 | 0.00 | 0.32 | 0.08 ± 0.11 | 1.00 | |
| 104602 | 2 | 25, 50 | 1.00 | 0.74 | 0.23 ± 0.25 | 0.00 | • |
| 109502 | 1 | 10 | 0.00 | 0.47 | 0.03 ± 0.18 | 0.84 | |
| 112802 | 3 | 10, 15, 15 | 0.33 | 1.09 | 0.28 ± 0.24 | 0.12 | |
| 113902 | 3 | 45, 15, 45 | 1.00 | 1.36 | 0.42 ± 0.21 | 0.00 | • |
| 114702 | 5 | 35, 15, 15, 50, 15 | 0.00 | 0.16 | 0.05 ± 0.09 | 1.00 | |
| 114902 | 4 | 25, 50, 50, 20 | 0.25 | 0.03 | 0.03 ± 0.08 | 0.00 | • |
| 123902 | 2 | 10, 10 | 0.50 | 0.14 | 0.03 ± 0.12 | 0.00 | • |
| Overall | - | - | 0.53 ± 0.33 | 1.83 ± 2.71 | 0.23 ± 0.48 | - | 28 |

**Table 18.** Testing parameters and performance obtained for each patient with the Seizure-batch Regression and the Chronological Accumulation data partitioning and iterative retraining method.

**Chronological Accumulation - Seizure-batch Regression**

| Patient | Evaluated seizures | SOP | SS | FPR/h | SS Surrogate | p-value | Above chance |
|---|---|---|---|---|---|---|---|
| 402 | 2 | 10, 15 | 0.00 | 9.38 | 0.25 ± 0.34 | 1.00 | |
| 8902 | 2 | 20, 20 | 0.50 | 0.31 | 0.22 ± 0.25 | 0.00 | ● |
| 11002 | 1 | 10 | 0.00 | 11.96 | 0.37 ± 0.48 | 1.00 | |
| 16202 | 4 | 45, 15, 10, 30 | 0.00 | 0.40 | 0.13 ± 0.15 | 1.00 | |
| 21902 | 1 | 10 | 1.00 | 0.19 | 0.30 ± 0.46 | 0.00 | ● |
| 23902 | 2 | 50, 45 | 1.00 | 1.17 | 0.33 ± 0.32 | 0.00 | ● |
| 26102 | 1 | 50 | 1.00 | 0.05 | 0.10 ± 0.30 | 0.00 | ● |
| 30802 | 5 | 50, 50, 50, 35, 35 | 0.80 | 0.61 | 0.39 ± 0.17 | 0.00 | ● |
| 32702 | 2 | 15, 15 | 0.50 | 1.63 | 0.15 ± 0.23 | 0.00 | ● |
| 45402 | 1 | 50 | 1.00 | 97.86 | 0.63 ± 0.48 | 0.00 | ● |
| 46702 | 2 | 35, 25 | 0.50 | 0.52 | 0.22 ± 0.31 | 0.00 | ● |
| 50802 | 2 | 15, 20 | 0.50 | 0.39 | 0.07 ± 0.17 | 0.00 | ● |
| 53402 | 1 | 15 | 1.00 | 0.03 | 0.03 ± 0.18 | 0.00 | ● |
| 55202 | 5 | 10, 10, 10, 10, 10 | 0.20 | 1.18 | 0.19 ± 0.18 | 0.35 | |
| 56402 | 1 | 25 | 1.00 | 1.55 | 0.27 ± 0.44 | 0.00 | ● |
| 58602 | 3 | 10, 10, 20 | 0.67 | 0.22 | 0.03 ± 0.10 | 0.00 | ● |
| 59102 | 2 | 15, 50 | 0.50 | 1.20 | 0.57 ± 0.33 | 0.85 | |
| 60002 | 3 | 25, 15, 15 | 0.33 | 0.64 | 0.19 ± 0.25 | 0.00 | ● |
| 64702 | 2 | 50, 25 | 0.50 | 0.43 | 0.20 ± 0.24 | 0.00 | ● |
| 75202 | 4 | 30, 10, 30, 40 | 0.00 | 0.10 | 0.05 ± 0.1 | 0.99 | |
| 80702 | 3 | 30, 30, 50 | 0.67 | 0.60 | 0.23 ± 0.20 | 0.00 | ● |
| 85202 | 2 | 10, 15 | 0.50 | 0.50 | 0.08 ± 0.19 | 0.00 | ● |
| 93402 | 2 | 50, 20 | 1.00 | 1.58 | 0.48 ± 0.33 | 0.00 | ● |
| 93902 | 3 | 50, 50, 40 | 0.33 | 1.51 | 0.24 ± 0.23 | 0.02 | ● |
| 94402 | 4 | 10, 50, 25, 10 | 0.25 | 5.11 | 0.35 ± 0.25 | 0.98 | |
| 95202 | 4 | 10, 30, 10, 40 | 0.25 | 0.41 | 0.06 ± 0.12 | 0.00 | ● |
| 96002 | 4 | 10, 20, 30, 30 | 0.00 | 2.68 | 0.43 ± 0.23 | 1.00 | |
| 98102 | 2 | 25, 50 | 0.50 | 0.55 | 0.15 ± 0.29 | 0.00 | ● |
| 101702 | 2 | 10, 40 | 0.50 | 0.24 | 0.20 ± 0.24 | 0.00 | ● |
| 102202 | 4 | 45, 25, 50, 50 | 1.00 | 0.83 | 0.38 ± 0.19 | 0.00 | ● |
| 104602 | 2 | 20, 30 | 0.50 | 0.82 | 0.28 ± 0.31 | 0.00 | ● |
| 109502 | 1 | 10 | 0.00 | 0.00 | 0.00 ± 0.00 | - | |
| 112802 | 3 | 10, 15, 15 | 0.33 | 3.01 | 0.29 ± 0.21 | 0.13 | |
| 113902 | 3 | 15, 15, 10 | 1.00 | 2.39 | 0.72 ± 0.21 | 0.00 | ● |
| 114702 | 5 | 35, 45, 10, 15, 15 | 0.00 | 0.17 | 0.07 ± 0.09 | 1.00 | |
| 114902 | 4 | 25, 35, 35, 35 | 0.00 | 0.21 | 0.13 ± 0.14 | 1.00 | |
| 123902 | 2 | 10, 20 | 0.50 | 0.18 | 0.05 ± 0.15 | 0.00 | ● |
| Overall | - | - | 0.50 ± 0.36 | 4.07 ± 15.82 | 0.23 ± 0.49 | - | 24 |

Even though the sensitivity was above the one from the Surrogate, it was not considered as statistically validated as the FPR/h is extremely large (●).

**Table 19.** Testing parameters and performance obtained for each patient with the Dynamic Weighted Ensemble and the Chronological Accumulation data partitioning and iterative retraining method.

**Chronological Accumulation - Dynamic Weighted Ensemble**

| Patient | Evaluated seizures | SOP | SS | FPR/h | SS Surrogate | p-value | Above chance |
|---|---|---|---|---|---|---|---|
| 402 | 2 | 10, 50 | 1.00 | 2.23 | 0.20 ± 0.24 | 0.00 | • |
| 8902 | 2 | 15, 20 | 0.50 | 0.54 | 0.18 ± 0.27 | 0.00 | • |
| 11002 | 1 | 10 | 0.00 | 14.37 | 0.33 ± 0.47 | 1.00 | |
| 16202 | 4 | 45, 15, 15, 50 | 0.50 | 0.77 | 0.21 ± 0.18 | 0.00 | • |
| 21902 | 1 | 40 | 0.00 | 1.50 | 0.40 ± 0.49 | 1.00 | |
| 23902 | 2 | 50, 45 | 1.00 | 2.59 | 0.50 ± 0.34 | 0.00 | • |
| 26102 | 1 | 50 | 1.00 | 0.88 | 0.47 ± 0.50 | 0.00 | • |
| 30802 | 5 | 35, 10, 10, 25, 50 | 0.80 | 1.45 | 0.32 ± 0.14 | 0.00 | |
| 32702 | 2 | 15, 15 | 0.50 | 1.86 | 0.27 ± 0.31 | 0.00 | • |
| 45402 | 1 | 50 | 1.00 | 0.00 | 0.00 ± 0.00 | 0.00 | • |
| 46702 | 2 | 30, 10 | 0.00 | 0.88 | 0.13 ± 0.22 | 1.00 | |
| 50802 | 2 | 15, 20 | 1.00 | 1.21 | 0.15 ± 0.23 | 0.00 | • |
| 53402 | 1 | 15 | 1.00 | 2.03 | 0.27 ± 0.44 | 0.00 | • |
| 55202 | 5 | 10, 10, 10, 10, 10 | 0.60 | 2.21 | 0.22 ± 0.16 | 0.00 | • |
| 56402 | 1 | 25 | 1.00 | 3.30 | 0.43 ± 0.50 | 0.00 | |
| 58602 | 3 | 10, 10, 20 | 0.33 | 0.48 | 0.08 ± 0.14 | 0.00 | • |
| 59102 | 2 | 50, 45 | 1.00 | 1.23 | 0.47 ± 0.31 | 0.00 | • |
| 60002 | 3 | 25, 15, 15 | 0.67 | 1.48 | 0.23 ± 0.21 | 0.00 | • |
| 64702 | 2 | 50, 25 | 1.00 | 2.14 | 0.53 ± 0.31 | 0.00 | • |
| 75202 | 4 | 30, 10, 50, 10 | 0.50 | 0.41 | 0.10 ± 0.17 | 0.00 | • |
| 80702 | 3 | 30, 30, 50 | 1.00 | 1.52 | 0.52 ± 0.19 | 0.00 | • |
| 85202 | 2 | 10, 15 | 0.00 | 0.64 | 0.10 ± 0.24 | 0.98 | |
| 93402 | 2 | 20, 15 | 0.50 | 2.30 | 0.45 ± 0.35 | 0.22 | |
| 93902 | 3 | 50, 50, 40 | 0.33 | 2.05 | 0.39 ± 0.27 | 0.86 | |
| 94402 | 4 | 10, 10, 10, 10 | 0.75 | 4.16 | 0.29 ± 0.21 | 0.00 | • |
| 95202 | 4 | 10, 40, 40, 40 | 1.00 | 1.99 | 0.49 ± 0.25 | 0.00 | • |
| 96002 | 4 | 10, 20, 30, 30 | 0.75 | 2.39 | 0.39 ± 0.21 | 0.00 | • |
| 98102 | 2 | 25, 50 | 1.00 | 0.90 | 0.20 ± 0.31 | 0.00 | • |
| 101702 | 2 | 10, 50 | 0.50 | 4.05 | 0.40 ± 0.37 | 0.08 | |
| 102202 | 4 | 45, 25, 50, 50 | 0.50 | 0.03 | 0.00 ± 0.00 | 0.00 | • |
| 104602 | 2 | 20, 25 | 0.00 | 0.79 | 0.10 ± 0.20 | 0.99 | • |
| 109502 | 1 | 30 | 0.00 | 0.00 | 0.00 ± 0.00 | - | |
| 112802 | 3 | 10, 15, 15 | 0.67 | 2.03 | 0.26 ± 0.22 | 0.00 | • |
| 113902 | 3 | 15, 15, 15 | 0.67 | 1.31 | 0.23 ± 0.21 | 0.00 | • |
| 114702 | 5 | 50, 30, 30, 45, 50 | 0.80 | 0.86 | 0.44 ± 0.2.0 | 0.00 | • |
| 114902 | 4 | 25, 35, 35, 35 | 0.75 | 0.48 | 0.26 ± 0.18 | 0.00 | • |
| 123902 | 2 | 10, 10 | 0.00 | 0.97 | 0.07 ± 0.17 | 0.98 | • |
| Overall | - | - | 0.61 ± 0.36 | 1.84 ± 2.31 | 0.25 ± 0.50 | - | 28 |

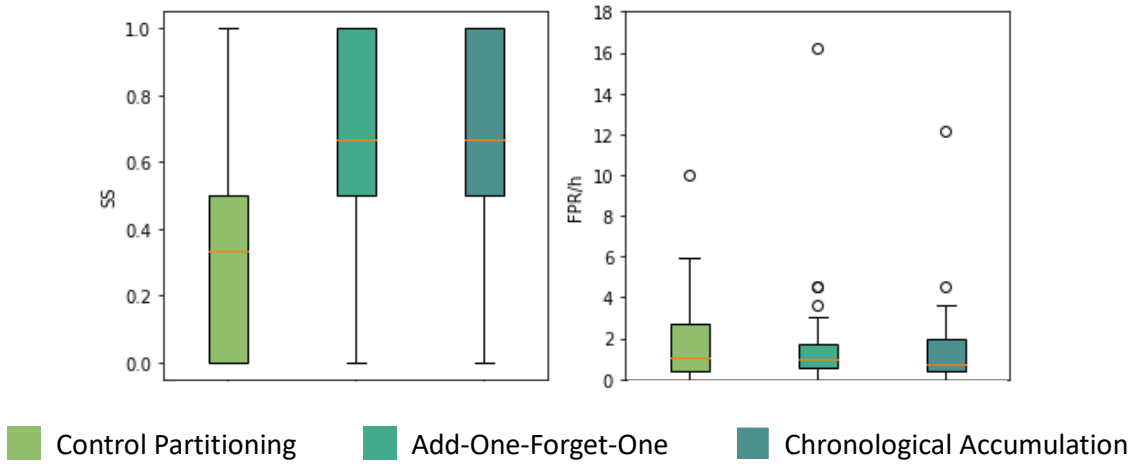


**Figure 1.** Seizure prediction performance across all patients for each data partitioning and iterative retraining method.

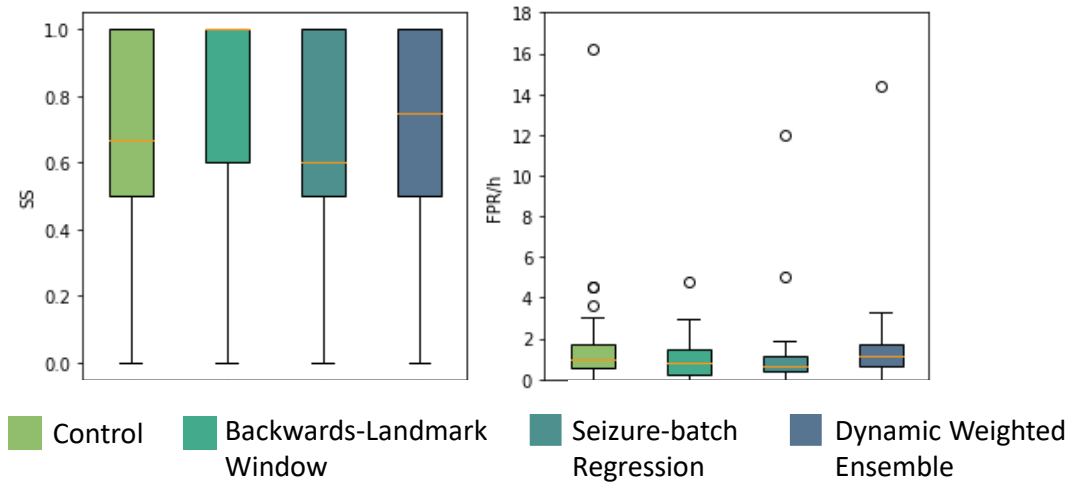


**Figure 2.** Seizure prediction performance across all patients for each concept drift adapting approach with the Add-One-Forget-One method. Seizure-batch Regression has an outlier of 97.86 FPR/h.

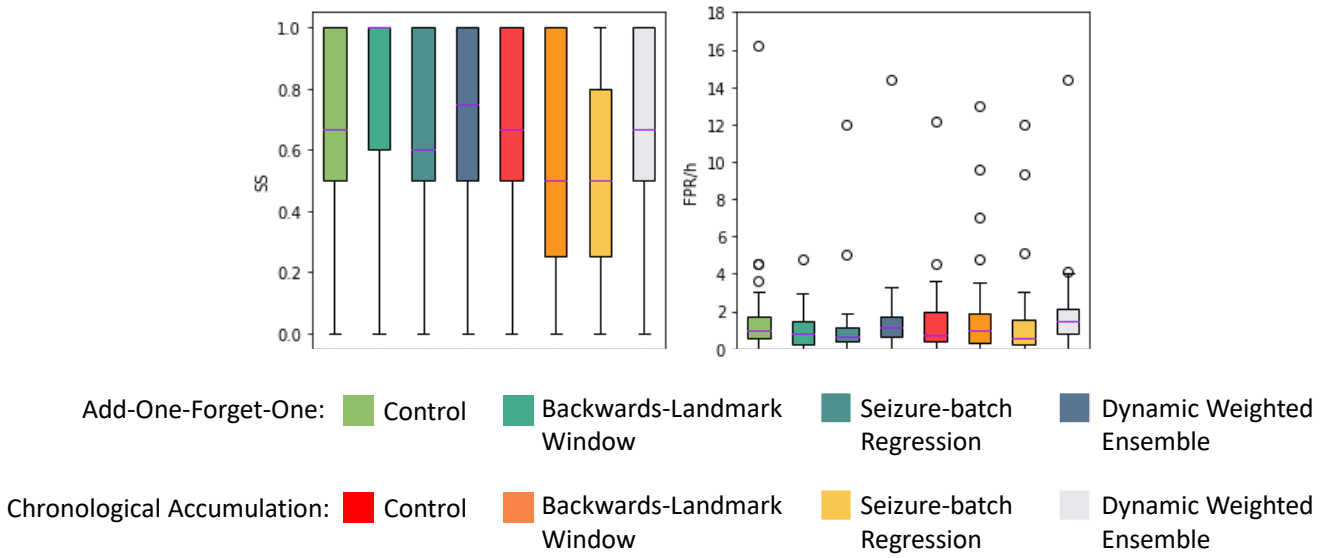


**Figure 3.** Seizure prediction performance across all patients for each approach, both Add-One-Forget-One and Chronological Accumulation methods. Seizure-batch Regression has an outlier of 97.86 FPR/h for both iterative retraining methods.

**Table 20.** Average seizure prediction performance across all patients for each approach, both Add-One-Forget-One and Chronological Accumulation methods.

| Approach | Retraining method | All patients | | | Validated patients | | |
|---|---|---|---|---|---|---|---|
| | | SS | FPR/h | SS Surrogate | % | SS | FPR/h |
| Control | Add-One-Forget-One | 0.63 ± 0.34 | 1.72 ± 2.65 | 0.26 ± 0.51 | 83.78 | 0.70 ± 0.27 | 1.69 ± 2.75 |
| | Chronological Accumulation | 0.68 ± 0.31 | 1.44 ± 2.06 | 0.23 ± 0.48 | 91.89 | 0.70 ± 0.30 | 1.32 ± 2.07 |
| Backwards-Landmark Window | Add-One-Forget-One | 0.75 ± 0.33 | 1.03 ± 1.00 | 0.22 ± 0.47 | 89.19 | 0.81 ± 0.25 | 0.91 ± 0.81 |
| | Chronological Accumulation | 0.53 ± 0.33 | 1.83 ± 2.71 | 0.23 ± 0.48 | 75.68 | 0.66 ± 0.29 | 1.92 ± 3.05 |
| Seizure-batch Regression | Add-One-Forget-One | 0.64 ± 0.31 | 3.73 ± 15.82 | 0.23 ± 0.48 | 86.49 | 0.68 ± 0.27 | 0.67 ± 0.51 |
| | Chronological Accumulation | 0.50 ± 0.36 | 4.07 ± 15.82 | 0.23 ± 0.49 | 64.86 | 0.67 ± 0.26 | 0.72 ± 0.59 |
| Dynamic Weighted Ensemble | Add-One-Forget-One | 0.69 ± 0.36 | 1.6 ± 2.26 | 0.25 ± 0.50 | 83.78 | 0.79 ± 0.28 | 1.18 ± 0.76 |
| | Chronological Accumulation | 0.61 ± 0.36 | 1.84 ± 2.31 | 0.25 ± 0.51 | 75.68 | 0.64 ± 0.34 | 1.49 ± 1.05 |

***Concept drift adaptation analysis***

For patient 55202, as seizures occur, the preictal period tends to a duration of 10 minutes, and the SVM costs are in the majority to the power of -6 and -10. Nonetheless, the algorithm, in addition to never selecting the channels F4 and P8 (see Figure 5), the selected channels overall vary significantly between seizures, we believe this may highlight different seizure generating processes. We noticed for all, except the $6^{th}$, evaluated seizures, a predominance of the relative power features of the beta, gamma1, gamma2, and gamma3 bands. Also, we selected some Hjörth parameters. For the $6^{th}$ seizure in particular, no relative power features were selected, but the ratios between the beta, gamma1, gamma2, and gamma3 bands, were chosen instead. Also, the number of selected features varied between 10 and 30, but there was a preference for 10 and 30.

Finally, for patient 114702, there is also a clear preference for the SVM cost of $2^{-10}$; the preictal duration is usually 15 minutes but is once 35 and other time 50 minutes. Regarding the electrode selection, all of them were chosen, ones more frequently than others. In particular, for the $7^{th}$ seizure, only two electrodes from the temporal lobes were selected (see Figure 6). However, for features other than a predominance for measures related to the theta, beta, gamma1, gamma2, and gamma3 bands, other features were selected, such as Hjörth parameters and wavelets, where five energy levels were kept. Also, the number of features chosen varied between 10 and 40, but there was a preference for 30 and 40.

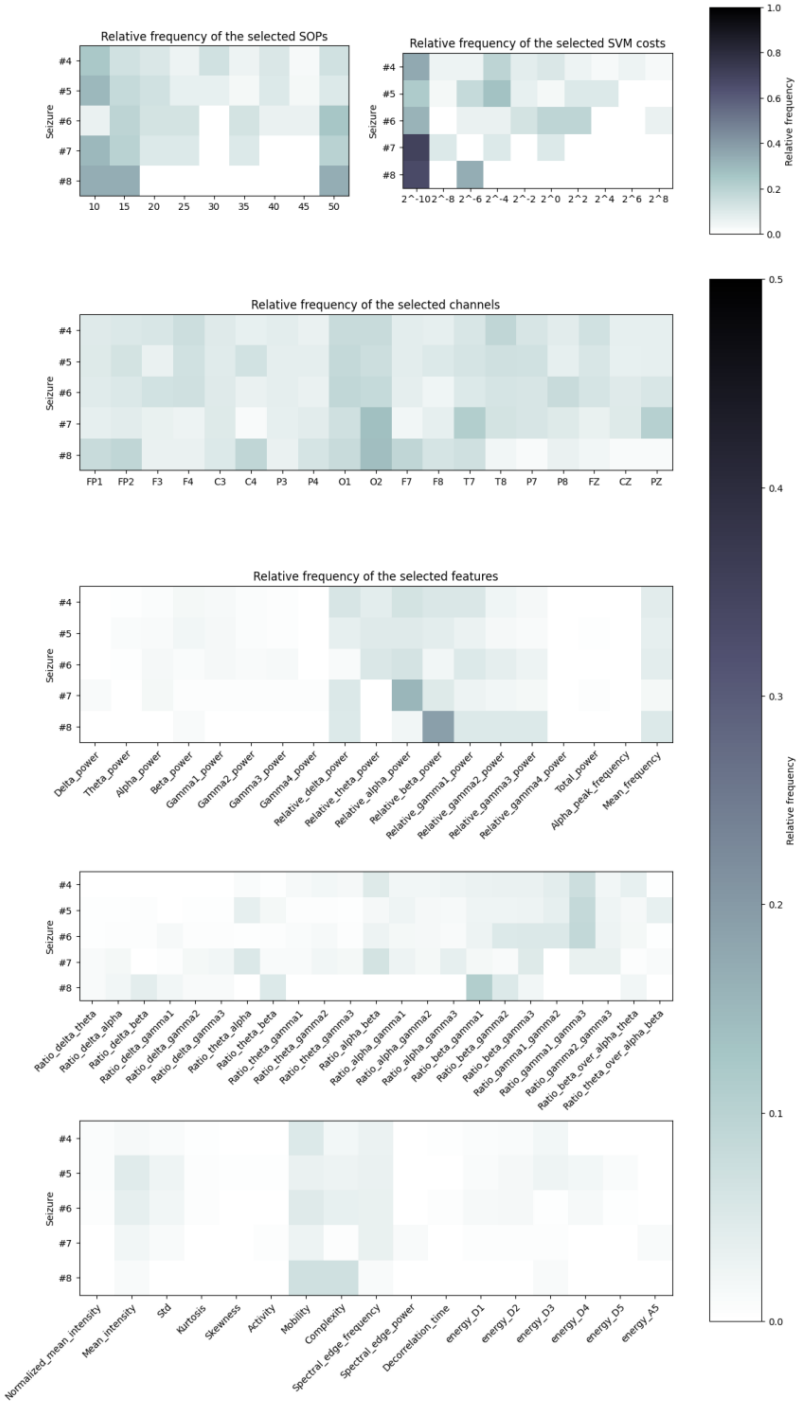


**Figure 4.** Relative frequency of the selected SOP duration, SVM costs, channels, and features for all 37 patients.

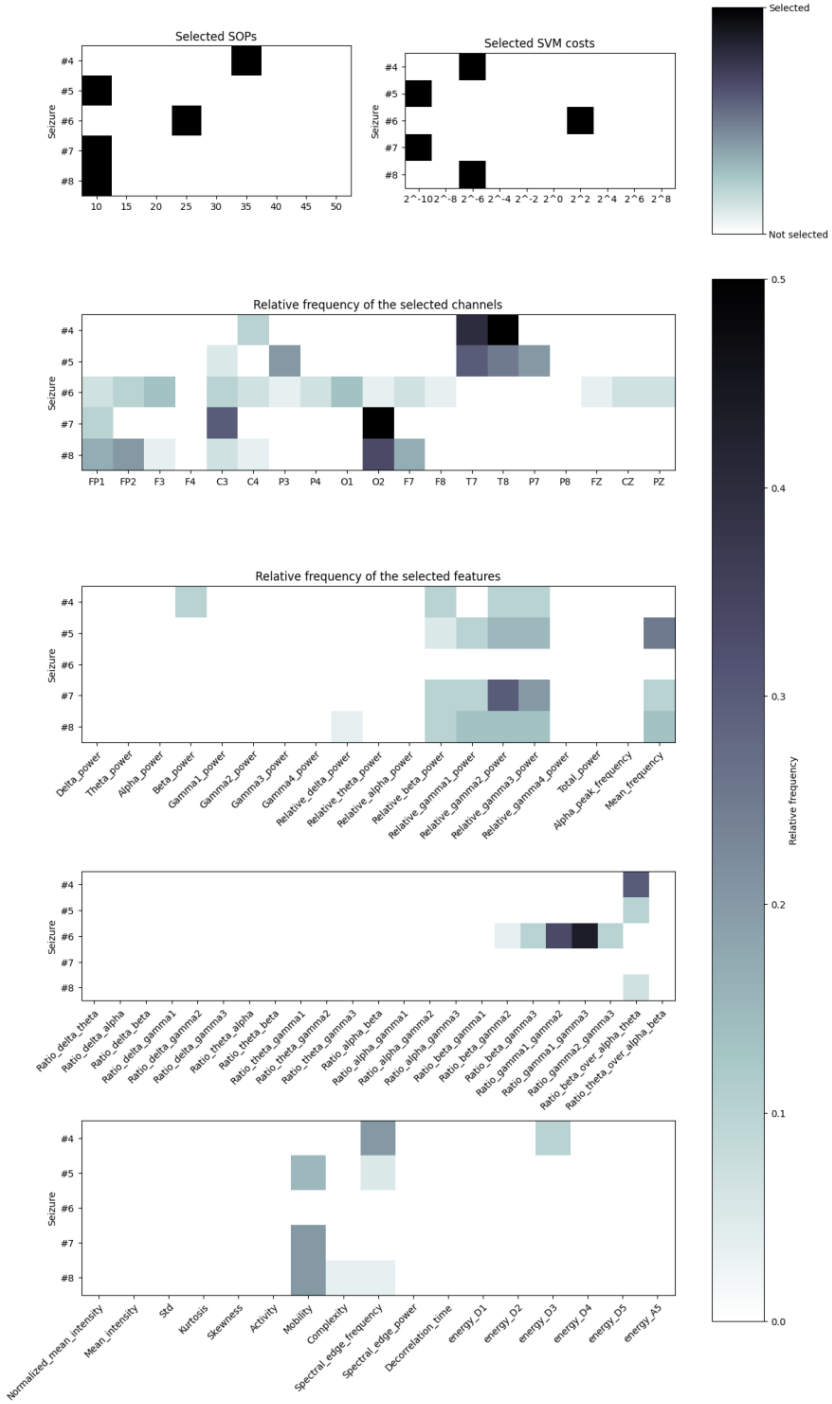


**Figure 5.** Relative frequency of the selected SOP duration, SVM costs, channels, and features for patient 55202.

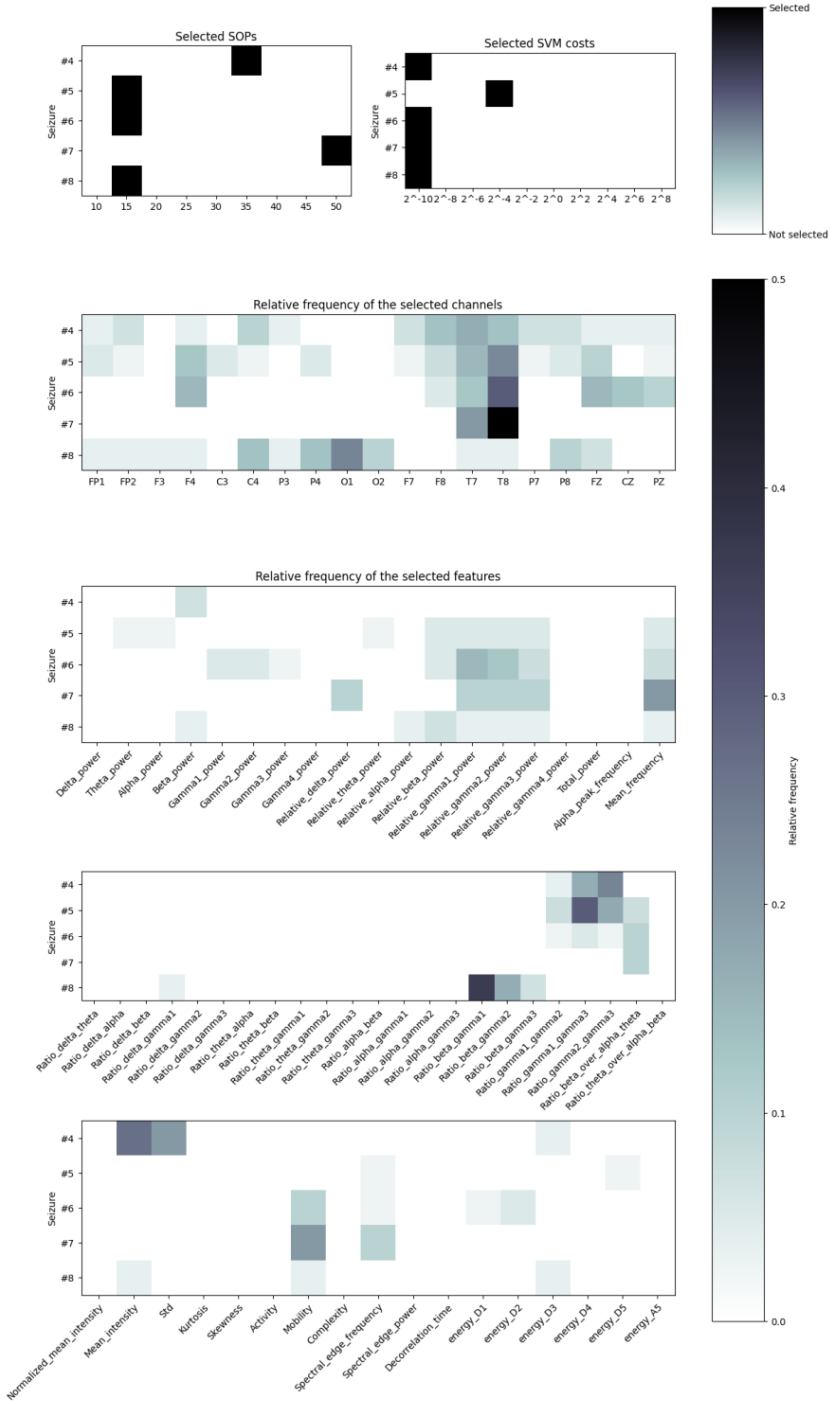


**Figure 6.** Relative frequency of the selected SOP duration, SVM costs, channels, and features for patient 114702.

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