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Artificial Intelligence in BrainRT

13th of June 2019, by Sabine Wuytens

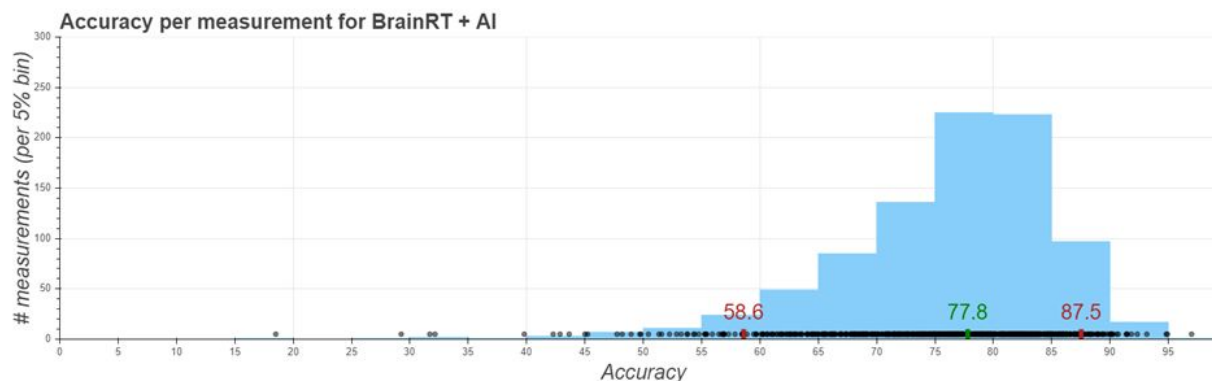## Artificial Intelligence to Improve Automatic Hypnogram

At OSG, we are investing in Artificial Intelligence, envisioning a significant improvement of the Automatic Analyses in BrainRT. Our goal: reducing manual scoring time of our customers to a minimum by offering high quality automatic labeling based on AI ("BrainRT AI").

Now, we are ready to present our first results related to the Automatic Hypnogram.

BrainRT AI results for Automatic Hypnogram

Higher levels of accuracy: The automatic Hypnogram of "BrainRT AI" has been evaluated on 1000 measurements. We find following results (May 2019) as visualized in the blue graph.

On average, BrainRT AI scores 78% of the hypnogram correctly, and in only 5% of measurements will the BrainRT AI score less than 59% of the hypnogram correctly.
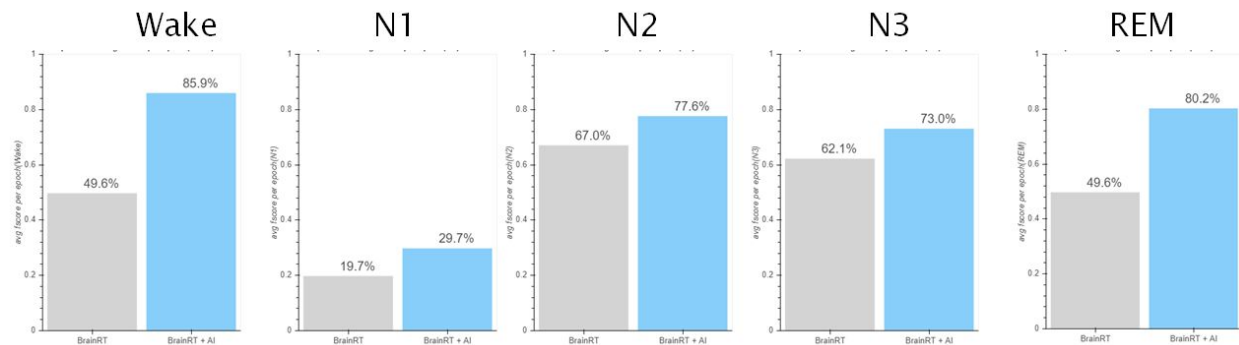
We include a reference plot of BrainRT performance on the same data set, which shows that the BrainRT AI outperforms BrainRT on an overall level.

Accuracy on an individual stage level is visualized below with F1 scores for BrainRT (grey) and) BrainRT AI (blue). We find Wake with the highest accuracy (86%), followed by REM (80%) and N2 (78%). The low performance for N1 (30%) is largely due to the limited number of epochs for modelling and will be improved within the next months by adding Slow Eye Movements as a feature.

Short term targets

Data collection: In the next months, we continue to build our data collection in collaboration with top clinical centers, to ensure a heterogeneous data set.

BrainRT AI : In a few months' time, we prepare to install the BrainRT AI solution on a partnering hospital's infrastructure to run a trial of our new BrainRT AI solution in real life, collect feedback from users, integrate it in the solution and maximize user experience.