



Sleep Library Sleep Stages Algorithm

We enable any kind of wearable device that contains PPG optical sensor and an accelerometer to become a sleep monitoring device.

The time asleep can be broken down into a cycle consisting of Light, Deep and REM (Rapid Eye Movement) sleep, and for a user to fully feel rested he should cycle through these stages at least a few times per night.

Our algorithmic solution allow to break these stages down and make it easy to identify problem for helping the user to reach a better sleep.



How does it work?

The algorithm is processing the PPG and/ or Acc signals, and calculates mathematical features and vitals. At morning, the vitals are transmitted to the mobile app for post-processing using our trained Neural Networks.



Nohayo Sleep Stages algorithm performance

The algorithm was developed and trained based on 830 night session that were collected in sleep labs. The sessions were labelled manually by physicians, and the models were trained accordingly.

The algorithm is implemented in embedded C and can run on wearables like a smartwatch, ring, and earbuds that has a PPG, a 3D accelerometer, and a DSP unit.

The accuracy of the algorithm meets FDA requirements as show below:

Algorithm	Wake	REM	Light	Deep	Accuracy
Nohayo Sleep Stages	83%	68%	75%	64%	72%