Claims

1. A computer implemented method for automatic detection of a predefined event in a dataset representing the level of muscular activity vs. time of a subject, the method comprising the steps of:
   a) calculating a threshold level of muscular activity assigned to time $t=t_1$ based on a background level determined from the dataset at a prior time $t=t_1-T_{back}$, where T_{back} is a first predefined period of time,
   b) checking the level of muscular activity, and if the level of muscular activity at time, t, exceeds the threshold level assigned to time t_1 for a second predefined period of time, $T_{clench/grind}$, then assigning an event to time t,
   c) if an event has been assigned to time t, then either waiting a predefined period of time T_{wait}, or waiting until the level of muscular activity is below the threshold for another predefined period of time T_{end},
   d) if no events have been assigned for a third predefined period of time $T_{silence}$, then repeating steps a)-c),
   e) if events have been assigned for a third predefined period of time $T_{silence}$, then repeating only steps b)-c).

2. The method according to claim 1, wherein the level of muscular activity is the level of biting force.

3. The method according to any of the preceding claims, wherein the predefined event is teeth clenching and/or teeth grinding.

4. The method according to claim 3, wherein an event of teeth clenching and/or teeth grinding is characterized as one or more of the following: bruxism, daytime bruxism, nocturnal bruxism.

5. The method according to any of the preceding claims, wherein the dataset comprises one or more of the following: electromyography (EMG) data, electroencephalography (EEG) data, phonomyography (PMG) data, acceleration data, sound data and strain gauge data.

6. The method according to any of the preceding claims, further comprising an initial step of providing a frequency domain transform of the dataset, a

frequency domain transform such as fast Fourier transform (FFT), discrete Fourier transform (DFT), discrete cosine transform (DCT) or discrete wavelet transform (DWT).

7. The method according to any of the preceding claims, wherein $T_{end} \leq T_{clench/grind} < T_{wait} < T_{back} < T_{silence}$.

8. The method according to any of the preceding claims, wherein $T_{end} = 0.125$ s, $T_{clench/grind} = 0.25$ s, $T_{back} = 2.5$ s, $T_{silence} = 5$ s and $T_{wait} = 1$ s.

9. The method according to any of the preceding claims, wherein T_{end} is between 0.4 and 0.6 times $T_{clench/grind}$.

10. The method according to any of the preceding claims, wherein T_{back} is between 0.4 and 0.6 times $T_{silence}$.

11. The method according to any of the preceding claims, wherein $T_{clench/grind}$ is between 0.05 and 0.15 times T_{back}.

12. The method according to any of the preceding claims, wherein T_{wait} is less than T_{back} and less than $T_{silence}$, such as between 0.15 and 0.25 times $T_{silence}$.

13. The method according to any of the preceding claims, wherein the threshold level is greater than and proportional to the background level.

14. The method according to any of the preceding claims, wherein the automatic detection is a real-time process carried out on a stream of data continuously received.

15. A device for monitoring facial activity related to teeth clenching and/or teeth grinding of a subject comprising:
    - a measuring unit for providing signals indicative of said facial activity, and
    - a processing unit for processing said signals in order to detect said teeth clenching and/or teeth grinding, wherein the processing unit is configured to automatically determine a threshold level according to any of the preceding

claims 1 to 14.

16. The device according to any claim 15, wherein the signals indicative of said facial activity represents the level of biting force vs. time of the subject and wherein the processing unit is configured to perform the method of any of the preceding claims 1 to 14 and wherein an event of teeth clenching and/or teeth grinding is an event of bruxism.

17. The device according to any of the preceding claims 15-16, wherein the measuring unit comprises an electrode assembly configured to be attached to the skin of the subject and wherein the device is configured to monitor the electrical connection between the electrode assembly and the skin, and wherein the processing unit is configured to begin processing the signals when a connection between skin and electrode assembly has been detected.

Claims

1. A computer implemented method for automatic detection of a predefined event in a dataset representing the level of muscular activity vs. time of a subject, the predefined event being teeth clenching and/or teeth grinding, the method comprising the steps of:
   a) calculating a threshold level of muscular activity assigned to time $t=t_1$ based on a background level determined from the dataset at a prior time $t=t_1-T_{back}$, where T_{back} is a first predefined period of time,
   b) checking the level of muscular activity, and if the level of muscular activity at time, t, exceeds the threshold level assigned to time t_1 for a second predefined period of time, $T_{clench/grind}$, then assigning an event to time t,
   c) if an event has been assigned to time t, then either waiting a predefined period of time T_{wait}, or waiting until the level of muscular activity is below the threshold for another predefined period of time T_{end},
   d) if no events have been assigned for a third predefined period of time $T_{silence}$, then repeating steps a)-c),
   e) if events have been assigned for a third predefined period of time $T_{silence}$, then repeating only steps b)-c).

2. The method according to claim 1, wherein the level of muscular activity is the level of biting force.

3. The method according to any of the preceding claims, wherein an event of teeth clenching and/or teeth grinding is characterized as one or more of the following: bruxism, daytime bruxism, nocturnal bruxism.

4. The method according to any of the preceding claims, wherein the dataset comprises one or more of the following: electromyography (EMG) data, electroencephalography (EEG) data, phonomyography (PMG) data, acceleration data, sound data and strain gauge data.

5. The method according to any of the preceding claims, further comprising an initial step of providing a frequency domain transform of the dataset, a frequency domain transform such as fast Fourier transform (FFT), discrete Fourier transform (DFT), discrete cosine transform (DCT) or discrete wavelet transform (DWT).

6. The method according to any of the preceding claims, wherein $T_{end} \leq T_{clench/grind} < T_{wait} < T_{back} < T_{silence}$.

7. The method according to any of the preceding claims, wherein $T_{end} = 0.125$ s, $T_{clench/grind} = 0.25$ s, $T_{back} = 2.5$ s, $T_{silence} = 5$ s and $T_{wait} = 1$ s.

8. The method according to any of the preceding claims, wherein T_{end} is between 0.4 and 0.6 times $T_{clench/grind}$.

9. The method according to any of the preceding claims, wherein T_{back} is between 0.4 and 0.6 times $T_{silence}$.

10. The method according to any of the preceding claims, wherein $T_{clench/grind}$ is between 0.05 and 0.15 times T_{back}.

11. The method according to any of the preceding claims, wherein T_{wait} is less than T_{back} and less than $T_{silence}$, such as between 0.15 and 0.25 times $T_{silence}$.

12. The method according to any of the preceding claims, wherein the threshold level is greater than and proportional to the background level.

13. The method according to any of the preceding claims, wherein the automatic detection is a real-time process carried out on a stream of data continuously received.

14. A device for monitoring facial activity related to teeth clenching and/or teeth grinding of a subject comprising:
    - a measuring unit for providing signals indicative of said facial activity, and
    - a processing unit for processing said signals in order to detect said teeth clenching and/or teeth grinding, wherein the processing unit is configured to automatically determine a threshold level according to any of the preceding claims 1 to 13.

15. The device according to any claim 14, wherein the signals indicative of said facial activity represents the level of biting force vs. time of the subject and wherein the processing unit is configured to perform the method of any of the preceding claims 1 to 14 and wherein an event of teeth clenching and/or teeth grinding is an event of

bruxism.

16. The device according to any of the preceding claims 14-15, wherein the measuring unit comprises an electrode assembly configured to be attached to the skin of the subject and wherein the device is configured to monitor the electrical connection between the electrode assembly and the skin, and wherein the processing unit is configured to begin processing the signals when a connection between skin and electrode assembly has been detected.