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Non-EEG Dataset for Assessment of Neurological Status

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Birjandtalab, Javad, Diana Cogan, Maziyar Baran Pouyan, and Mehrdad Nourani, A Non-EEG Biosignals Dataset for Assessment and Visualization of Neurological Status, 2016 IEEE International Workshop on Signal Processing Systems (SiPS), Dallas, TX, 2016, pp. 110-114. doi: 10.1109/SiPS.2016.27

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Introduction

This database contains non-EEG physiological signals collected at Quality of Life Laboratory at University of Texas at Dallas, used to infer the neurological status (including physical stress, cognitive stress, emotional stress and relaxation) of 20 healthy subjects. The data was collected using non-invasive wrist worn biosensors and consists of electrodermal activity (EDA), temperature, acceleration, heart rate (HR), and arterial oxygen level (SpO2).

Data Collection

The experimental procedures involving human subjects described in this work were approved under UTD IRB # 12-29 by the Institutional Review Board at the University of Texas at Dallas, Richardson, Texas, USA.

The dataset consists of 7 stages for 20 subjects:

1. First Relaxation: five minutes
2. Physical Stress: Stand for one minute, walk on a treadmill at one mile per hour for two minutes, then walk/jog on the treadmill at three miles per hour for two minutes.
3. Second Relaxation: five minutes.
4.
   1. Mini-emotional stress*: 40 seconds (Note: This portion of the data, which was collected right before the cognitive stress task, is not explained in the paper.) During this 40 seconds, the "instructions" for the math portion of the cognitive stress (to count backwards by sevens, beginning with 2485, for three minutes) were read to the volunteer.
   2. Cognitive Stress: Count backwards by sevens, beginning with 2485, for three minutes. Next, perform the Stroop test for two minutes. The volunteer was alerted to errors by a buzzer. The Stroop test consisted of reading the names of colors written in a different color ink, then saying what color the ink was.
5. Third Relaxation: five minutes.
6. Emotional Stress: The volunteer was told he/she would be shown a five minute clip from a horror movie in one minute. After the minute of anticipation, a clip from a zombie apocalypse movie, The Horde was shown.
7. Forth Relaxation: five minutes.

*Note: We had not originally intended to count the reading of the instructions to

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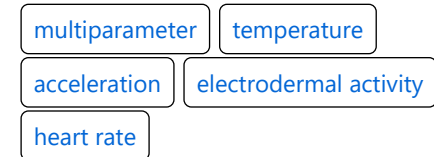
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DOI:
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Topics:
multiparameter   temperature
acceleration   electrodermal activity
heart rate

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count backwards as an emotional stress. After all, instructions were given for each of the tasks. Unlike the other instruction sets, however, this one created a stress response in many of the volunteers that was obvious to the test administrator as the test was being given.

Files

The data files are provided in WFDB format with two records per subject: one that contains the accelerometer, temperature, and EDA signals, and one that contains the SpO2 and heart rate signals. Header files also contain information about the subject. There is one annotation file per subject that indicates the time locations and labels of the transition states. The subjectinfo.csv file also contains information about each subject.

Contributors

A team of researchers from Quality of Life Technology Laboratory at University of Texas at Dallas created and contributed this database to PhysioNet. The contributors include: Diane Cogan, Javad Birjandtalab, Maziyar Baran Pouyan, and Professor Mehrdad Nourani. Jay Harvey, D.O and Venkatesh Nagaraddi, M.D contributed in this research as Neurology Consultants.

Files

Total uncompressed size: 3.7 MB.

Access the files

- Download the ZIP file (3.7 MB)
- Access the files using the Google Cloud Storage Browser here. Login with a Google account is required.
- Access the data using the Google Cloud command line tools (please refer to the gsutil documentation for guidance):
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