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WLA4NDD: a Wearable Dataset of Learning Activities forYoung Adults with Neurodiversity to Provide Support in Education

Version 1.0

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The experiments had been carried out with 8 participants with neurodiversity (aged 23-31 years old). Each participant performed four learning tasks (2 reading, 1 copying by typing, and 1 prompt writing). Each task lasted around 10 minutes, given the options for participants to withdraw and to take a break anytime they want. Participants were told at the beginning of the session to flip over the paper when they finished writing or reading as well as to close the laptop when they finished a typing task. Between two tasks, there was a 3 minute break.

On average, two reading tasks took 11 minutes and 8 minutes respectively, typing took 9 minutes, and writing took 6 minutes to be completed.

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The raw data includes the following data points: 8,546 for accelerometer, 8,550 for linear acceleration, 8,255 for gyroscope, 8,604 for gravity, and 898 for heart rate.

The experiments were video-recorded to allow for manual labelling of the data. See 'activity\_labels.txt' for more labeling details.

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The sensor raw signals (accelerometer, linear acceleration sensor, gyroscope, and gravity sensor, and heart rate sensor) were pre-processed with applied sampling in fixed-width sliding windows of 100 readings per window with 50% overlap.

For the pre-processed data, in terms of labels, the pre-processed data includes a total of data points: 3,688 for Read; 2,410 for Write; 1,585 for Write Q&A; 3,533 for Type; 2,385 for Rest; and 610 for Off-task. The total number of data points is 14,211. This results in 9 data points per second.

See 'features\_info.txt' for more details.

The dataset includes the following files/folders:

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- 'README.txt'

- 'features\_info.txt': Shows information about the variables used on the feature vector.

- 'activity\_labels.txt': Links the class labels with their activity name.

- 'pre-processed data with labels' folder: pre-processed 8 CSV files for 8 participants, where each row has 65-feature vector and 6 columns of six labels in the format of one-hot encoding

For each .CSV record it is provided:

- A feature vector of sensor feature

- Its activity label

- 'raw data with labels': 8 CSV files of raw data signals with labels for 8 participants

For each .CSV record it is provided:

- sensor feature data

- Its activity label

- timestamps

- sensor source

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