BEDA Behavior External Data Analysis

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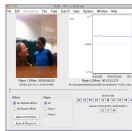University of Illinois at Urbana Champaign

Motivation

Help researchers to analyze longitudinal multimodality data (e.g., video, human-annotated behavioral data, physiological measures etc.) in a study exploring relationship between behavioral and physiological changes. (e.g., efficacy of sensory integration therapy).
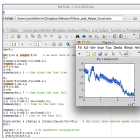
Challenges

1. Researchers use multiple software programs to analyze longitudinal multimodality data.

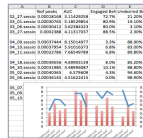Visualize and synchronize different data streams using ELAN

Move through a video file every x seconds by hand and annotate behaviors using pen and paper or Word document

Process and analyze data streams using Matlab

Analyze and visualize analysis results using Excel

2. It is difficult to manually manage a lot of data collected during longitudinal studies.

3. With data streams residing in different software environments, it can be cumbersome to move between analysis results and actual data streams.

BEDA Unified environment for visualizing, processing, and analyzing longitudinal multimodality data

Main view for visualization, synchronization, and annotation
- View video, data streams, and annotated behaviors (b and c).
- One-click synchronization for video and multiple data streams (a).
- Allow users to define name, color, and hotkey for targeted behaviors (e) for video (behavior) annotation. Users can annotate behaviors on timeline by pressing a corresponding hot key (c).
- Allow interval play mode for behavior annotation, which plays a video for x seconds in fast speed and y seconds in normal speed (d). Users can annotate behaviors if the specified behavior occurred anywhere in the past y seconds.


Analysis window for processing and analyzing data streams
- Process and analyze data streams (e.g., physiological data, audio, or any type of time series data etc.) (a) by selecting a pre-programmed analysis script (b).
- Allow for writing own scripts using MATLAB and R and importing into BEDA.
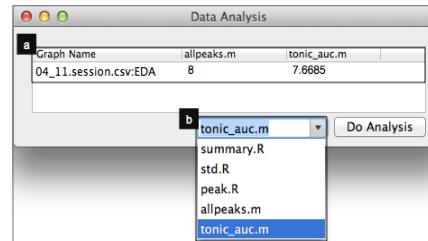
Overview for visualizing analysis results
- Visualize results of multiple sessions across time in a longitudinal study (b and c).
- Clicking names of sessions in the list box (a) opens them in the multi-sessions view.
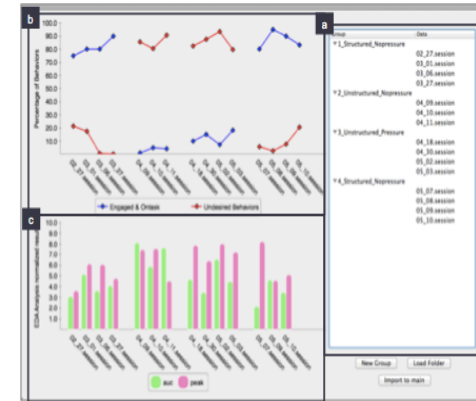
Multi-sessions view for comparing multiple sessions' data
- Compare and contrast multiple sessions' actual data streams. (e.g., If users drag one of the orange playheads (a-2), all the data related to this session (a-1 and a-2) move together while other data (b-1, b-2, c-1, c-2) stay.)