



Dynamic Heat Map

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Introduction



My Lab

- Working here for 2 years
- Computational Cognition and Learning Laboratory
 - Dr. Chen Yu
- Cognitive science / child development
- Experiment used in the project involves eye trackers on unchanging stimuli
- Program in MATLAB

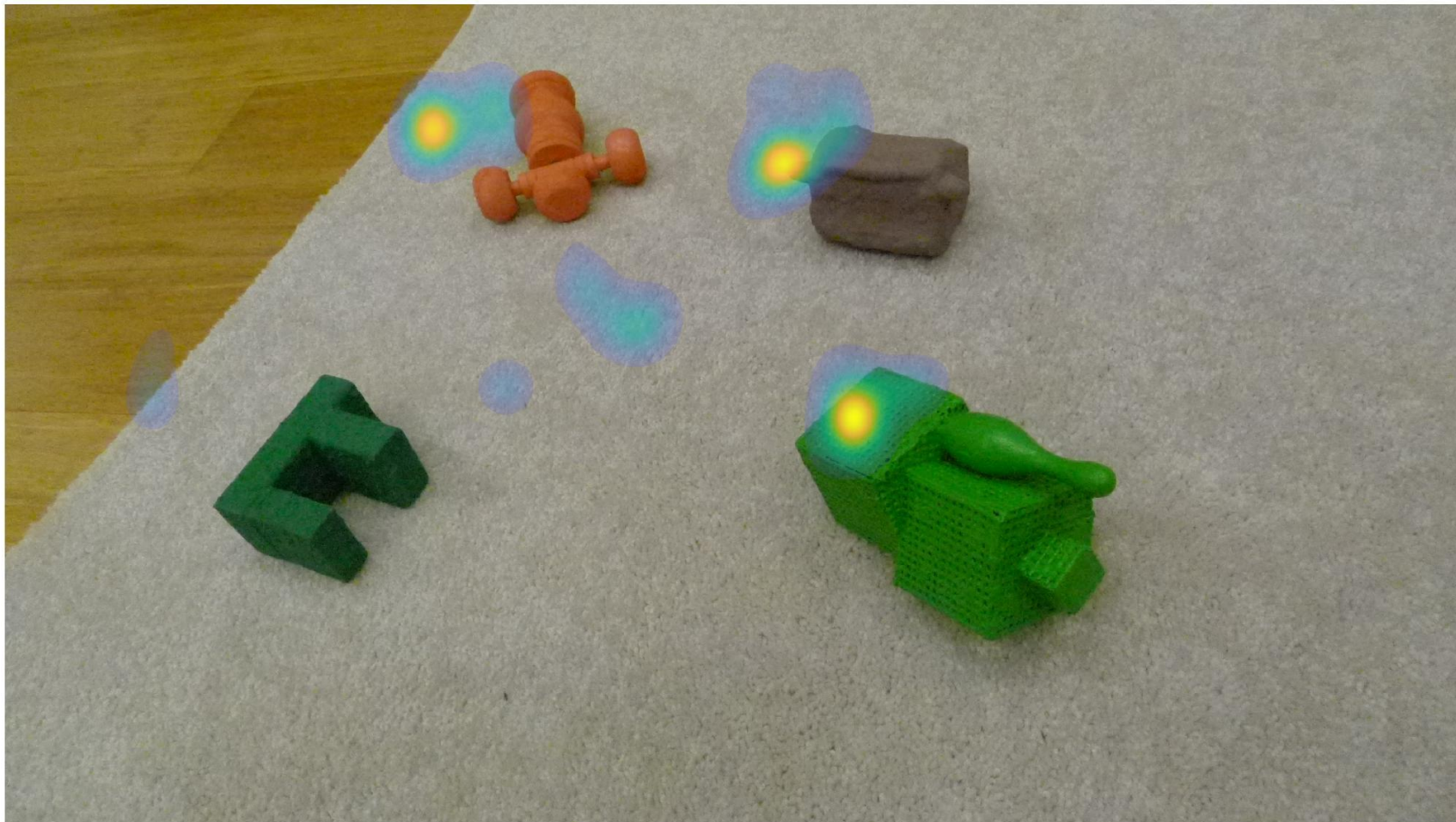


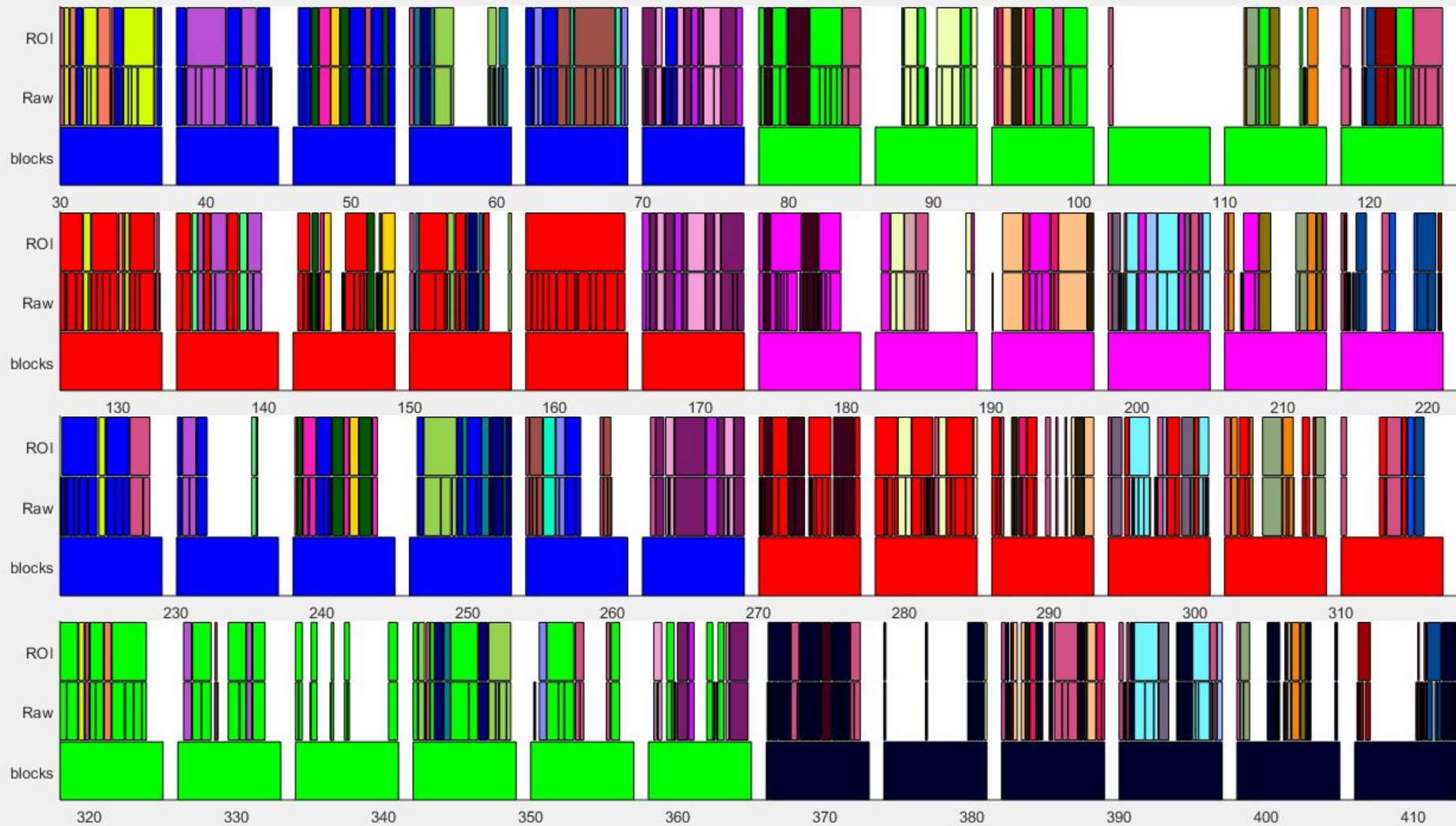
Problem & Task



Current Visualizations

- Heat Maps
 - Show spatial data
 - Leave out context of time
- Data Streams
 - Show temporal data
 - Leaves out context of space
- Goal is to create a tool that shows both







Documentation



How it works

- Special data called “continuous data” is loaded from specified subject
 - Data contains XY coordinates on 1920x1080 grid
- Data is split into trials (7 sec each)
- Plot onto grid, gaussian blur applied
 - Values are either added with or without weight
- Alpha level is interpolated with value on cartesian plane
- Background image placed under heat map



Dynamic Heat Map

- `dynamic_heat_map(subIDs,trialNum,timeProportion,showFull,saveMaps)`
- Required Arguments:
 - `subIDs`
 - `trialNum`
 - `timeProportion`
- Optional Arguments:
 - `showFull`
 - `saveMaps`



subIDs

- Integer array or experiment number
- 10001 [10001 10003 10005] 10001:10003 100
 - 10001 - single subject, creates one heat map
 - [10001... 10005] - array that calls each specified subject
 - 10001:10003 - inclusively calls all values between specified bounds
 - 100 - experiment number, calls all subjects in that experiment



trialNum

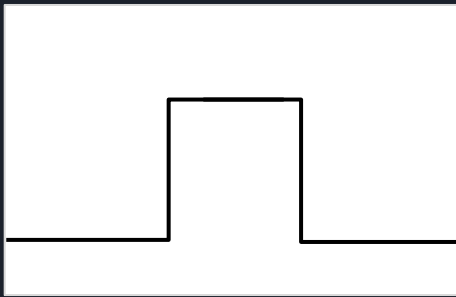
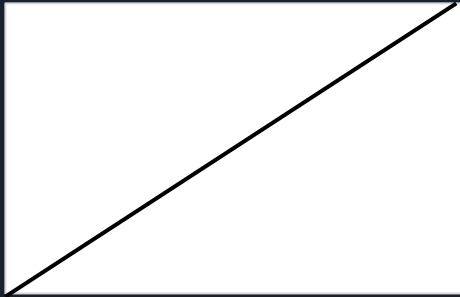
- Integer array
- 1 [12 16 19] 1:12
 - 1 - single value, calls one trial
 - [12 ... 19] - array calls each specified value
 - 1:12 - inclusively calls each value between specified bounds



timeProportion

- Either a value between 0 and 1
 - The given trial(s) will be divided into two parts, the first being the p , and the second being $1-p$
- Array with 210 values between 0 and 1
 - Any function to add specified weight, or slice particular section

Examples of custom functions





showFull

- Boolean parameter (defaults to false)
 - True displays an additional heat map containing full trial data
 - False shows only the heat maps affected by timeProportion



saveMaps

- Boolean parameter (defaults to false)
 - True generates jpg images of maps and doesn't display via MATLAB
 - False will only show MATLAB figure and will not save images



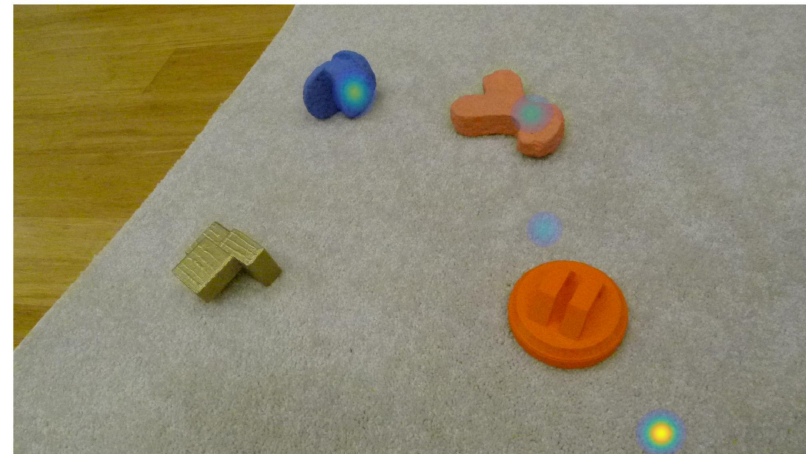
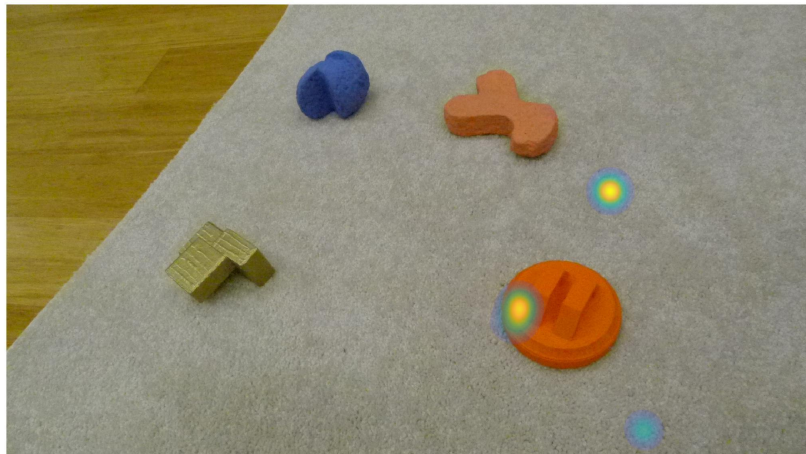
Notes

- All heat maps are normalized against highest value in contained set of data
- Using custom function of weight will only display one map, if show full is enabled it will display unweighted version

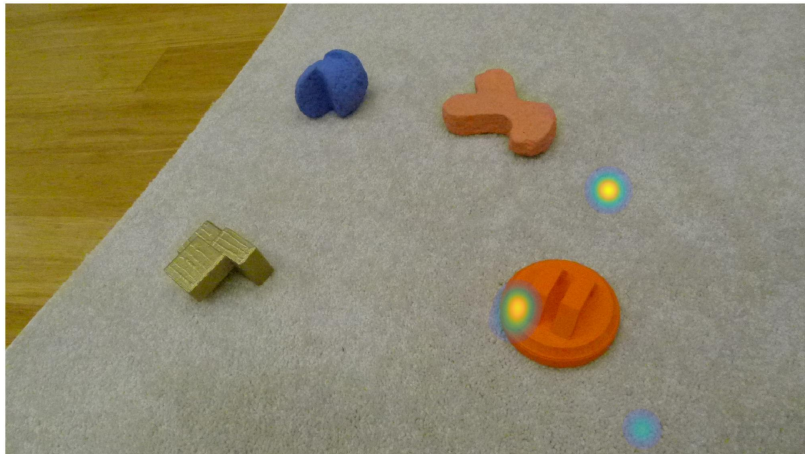


Examples

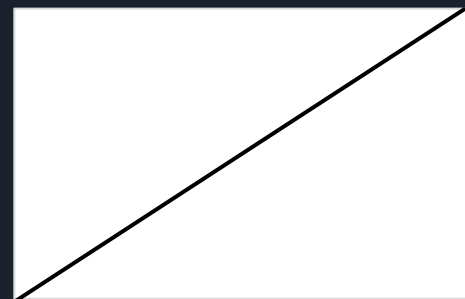
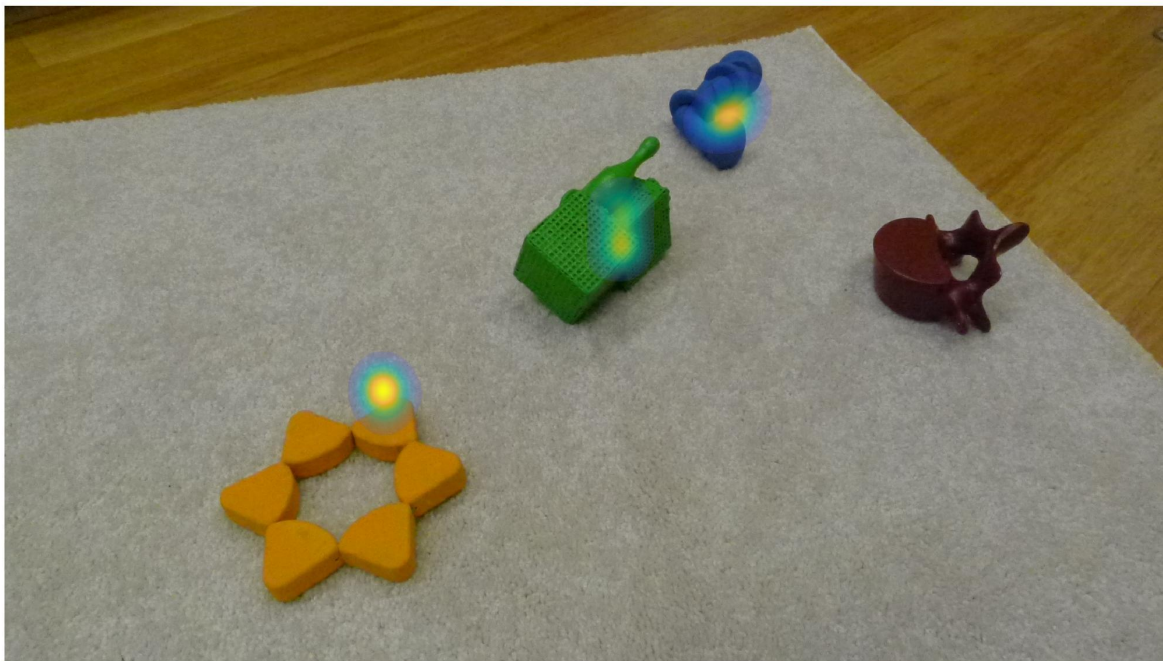
10004, 36, 50%



10004, 40, 50%



10002, 16, positive linear



10002, 16, middle 50

