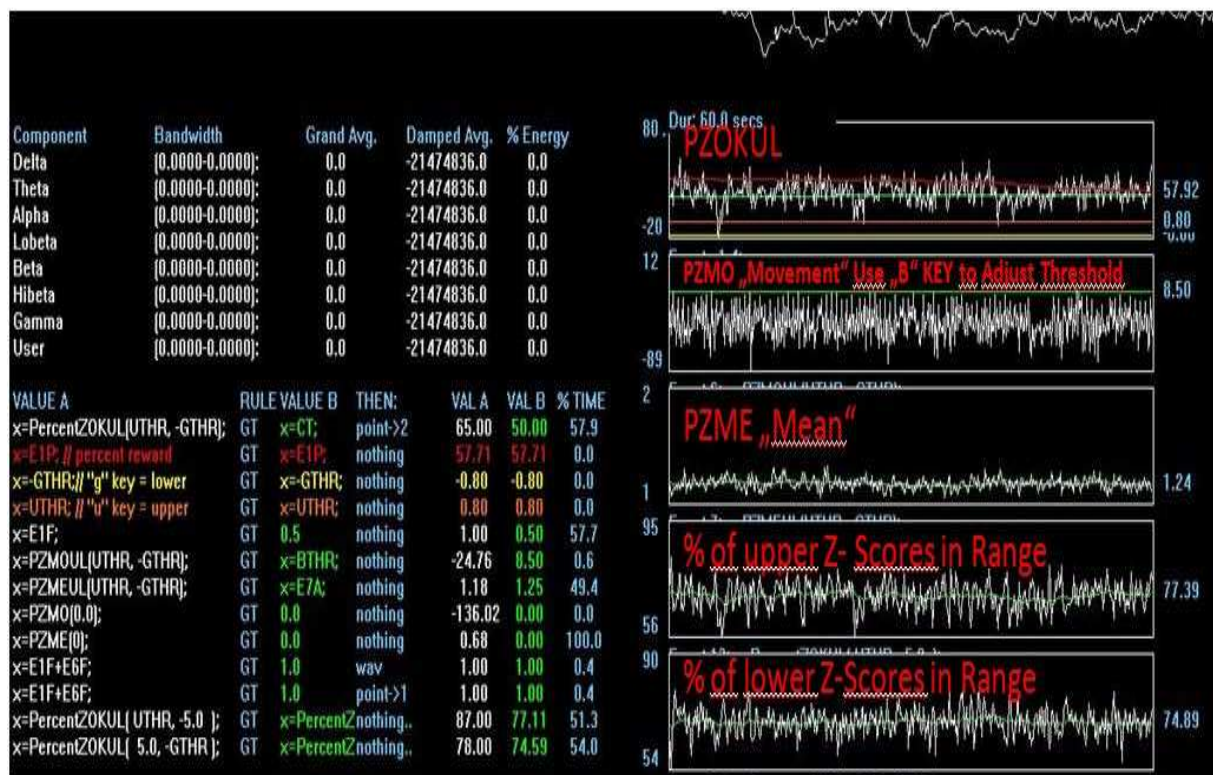


Z Score Plus Niels

Features:

- PZMO Threshold adjustable on the fly
- PZME with numeral display
- Display of % of upper/ lower Z – Scores in the defined Range (Thanks to Gottfried Arens)
- PZMO Rewarding only when PZOKUL is above Threshold
- Counter for PZMO
- Counter for PZOKUL
- Midi Sounds

Discription:



PZOKUL : How many Z – Score are in the defined Range

PZMO : Movement of the outliers. “What is the tendency to move inward” (gravity). The Threshold defines the % of the outliers that move inward. If you set it to 10 for example, the client hears a “ ding” sound, if there is an approximation of 10% to normal . There is a sustained reward time, so that the client has to met this criteria for 100 milliseconds.

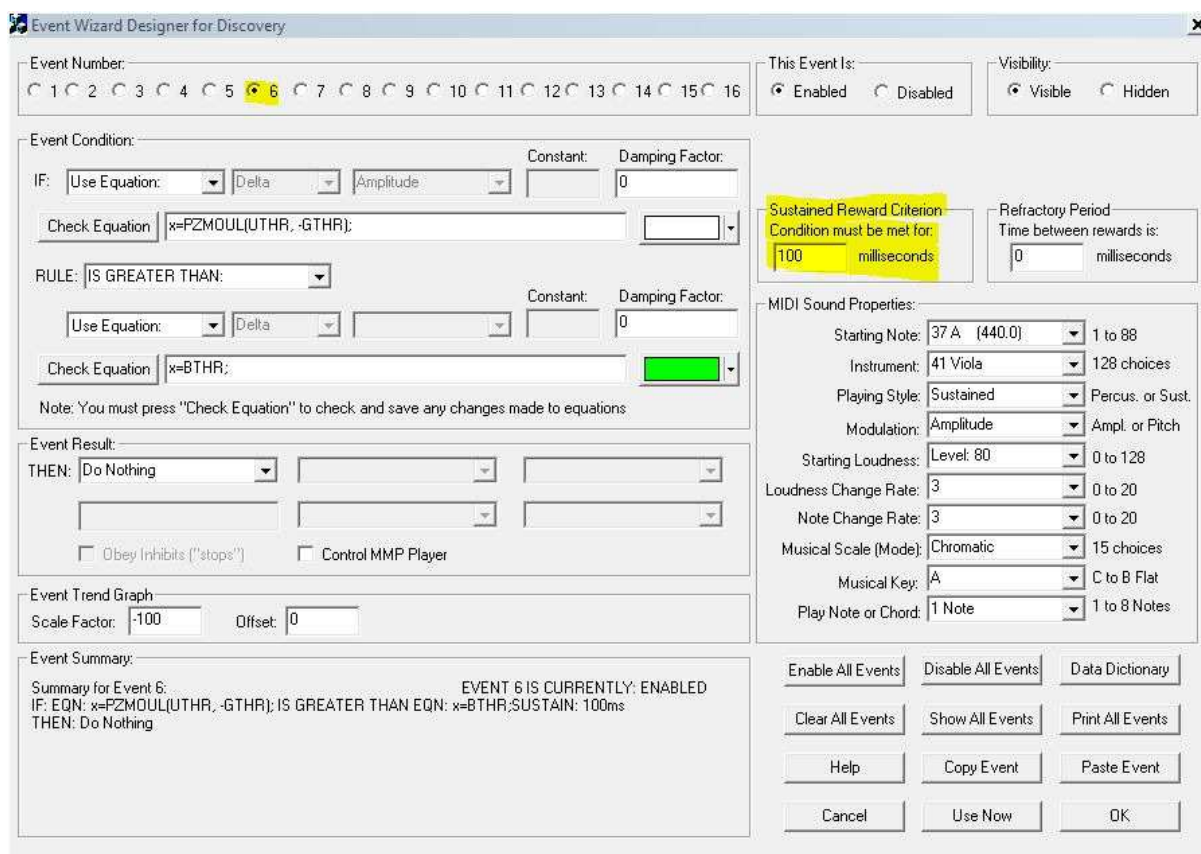
PZME : The average Size / Mean of the outliers. This value should decrease during training.

% of upper Z – Scores in Range: Shows how many % of the upper Z- Scores are in the defined Range

% of lower Z – Scores in Range: Shows how many % of the lower Z- Scores are in the defined Range



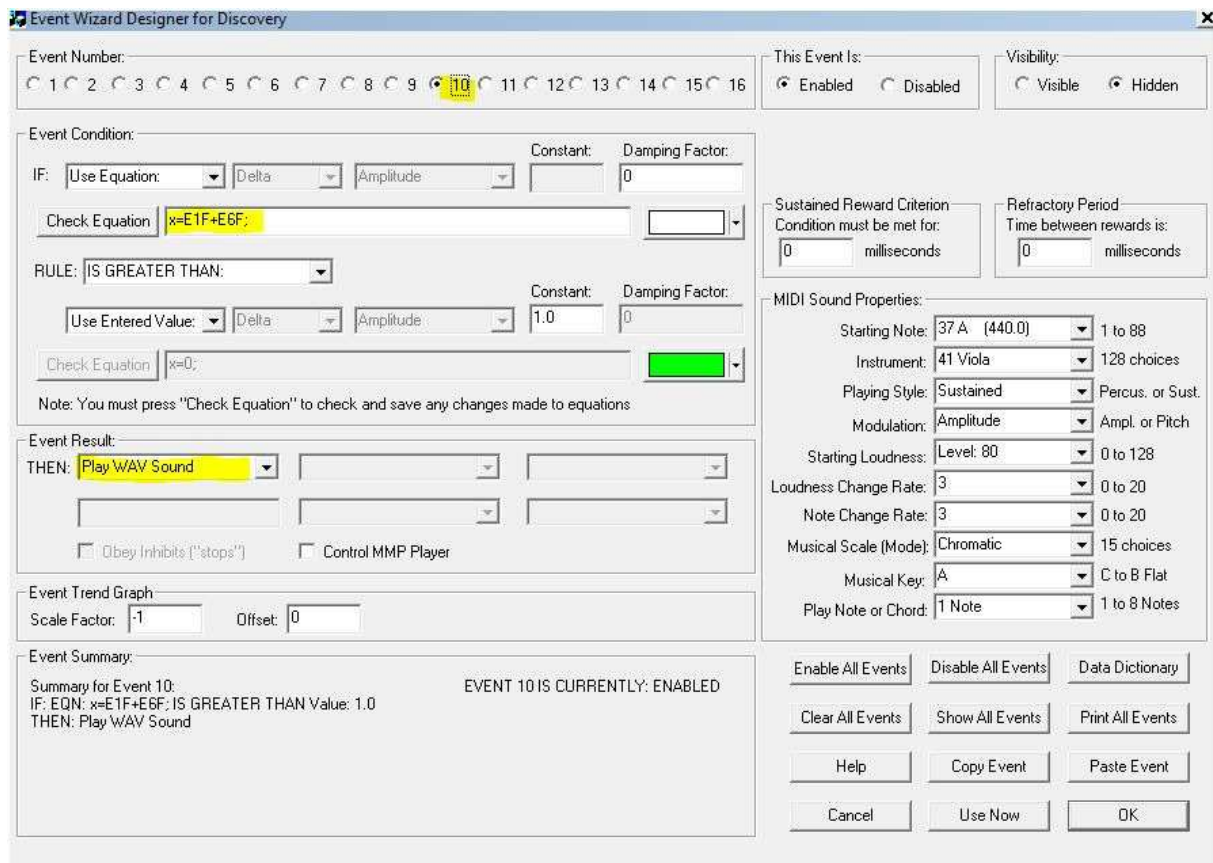
1. **PZMO Counter** : If PZMO and PZOKUL are above Threshold, there is a Point and a “ding” .wav
2. **PZOKUL Counter** This Counter is active if PZOK is above Threshold (necessary for Flash Games)



Event 6 : PZMO has a Sustained Reward Criterion(SRC) → 100ms above the defined Threshold.

Changing the SRC Time or raising the Threshold with the “B” Key will make it harder.

For example : lower Threshold should have larger SRC Time / Higher Threshold should have less SRC

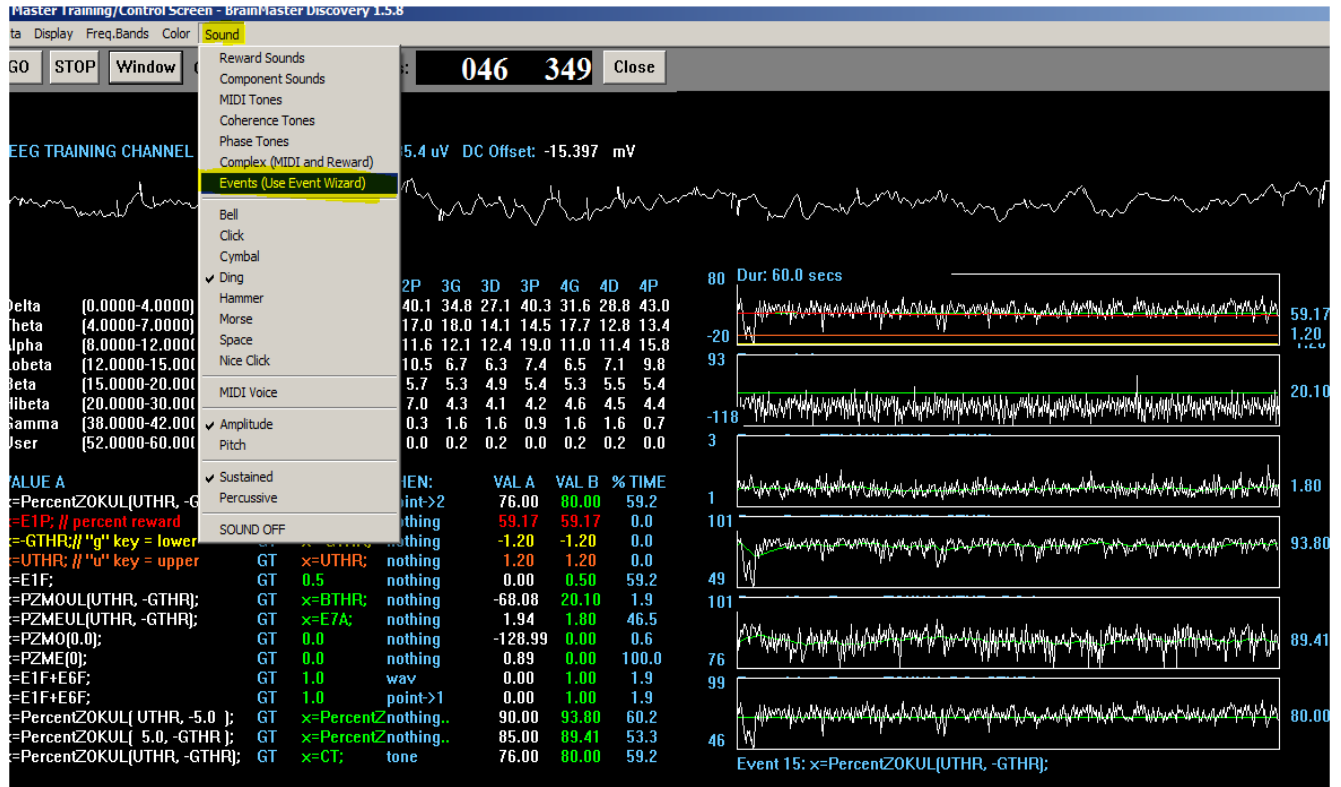


Event 10 : The “Ding” .wav occurs only if PZOK and PZMO met the criteria, this will stop rewarding “light” artifacts. “Heavy” artifact will still cause a reward, I think it’s because of the delay of the values going back to zero .

“PZMO by itself will definitely reward artifact. This is a logical consequence of how it is defined. Since the z-scores can go “wild,” then there is also a lot of improvement at given instants. So if you blink your eyes, etc., PZMO will definitely achieve some high values at certain moments. This would erroneously reward artifact. (Tom Collura)

Using Reward Sounds (for Flash Games etc.)

To enable the sound just set the “hook” at Events (Use Event Wizard). This will enable the midi sound, if the Percent ZOK threshold is met. I am using the sounds additional for the Flash Games



Changing the midi sounds

You can change the sounds/instruments in Event 15. The playing style is defined to percussive, the modulation is on/off.

Event Wizard Designer for Discovery

Event Number: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

This Event Is: Enabled Disabled

Visibility: Visible Hidden

Event Condition:

IF: Use Equation: Delta Amplitude Constant: Damping Factor: 0

Check Equation: $x = \text{PercentZOKUL}(\text{UTHR}, -\text{GTHR})$

RULE: IS GREATER THAN:

Use Equation: Delta Amplitude Constant: Damping Factor: 0

Check Equation: $x = \text{CT}$

Note: You must press "Check Equation" to check and save any changes made to equations

Event Result:

THEN: Play MIDI Sound

Obey Inhibits ("stops") Control MMP Player

Event Trend Graph:

Scale Factor: -100 Offset: 0

Event Summary:

Summary for Event 15: EVENT 15 IS CURRENTLY: ENABLED
 IF: EQN: $x = \text{PercentZOKUL}(\text{UTHR}, -\text{GTHR})$; IS GREATER THAN EQN: $x = \text{CT}$;
 THEN: Play MIDI Sound MODE: 2 NOTE: 77 INSTR: 115 Woodblock
 STYLE: Percussive MODULATION: ON/OFF LOUDNESS: Level: 70
 LOUDNESS CHANGE RATE: 3 PITCH CHANGE RATE: 1
 KEY: A MODE: Major (Ionian) CHORD: 1 Note

MIDI Sound Properties:

Starting Note: 77 C# (4434.9) 1 to 88

Instrument: 115 Woodblock 128 choices

Playing Style: Percussive Percus. or Sust.

Modulation: ON/OFF Ampl. or Pitch

Starting Loudness: Level: 70 0 to 128

Loudness Change Rate: 3 0 to 20

Note Change Rate: 1 0 to 20

Musical Scale (Mode): Major (Ionian) 15 choices

Musical Key: A C to B Flat

Play Note or Chord: 1 Note 1 to 8 Notes

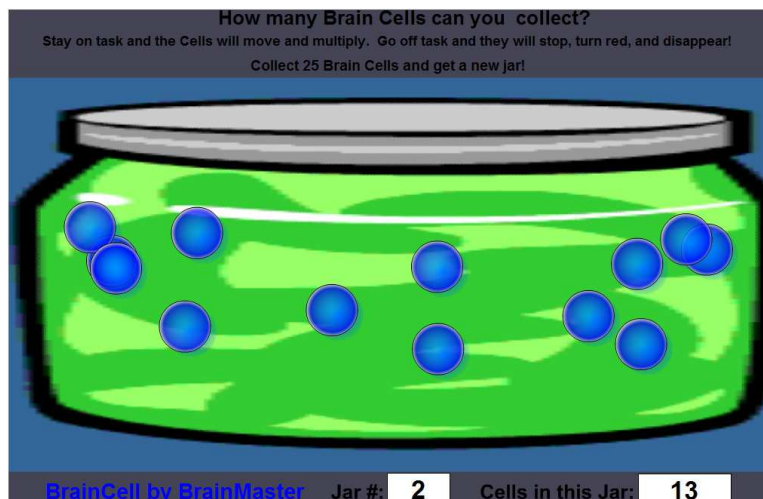
Enable All Events Disable All Events Data Dictionary

Clear All Events Show All Events Print All Events

Help Copy Event Paste Event

Cancel Use Now OK

I am using this settings for the Brain Cells Flash Animation



Thanks to: Dörte, Tom, Thomas and Gottfried ☺