ABCD
Final MID Task Design

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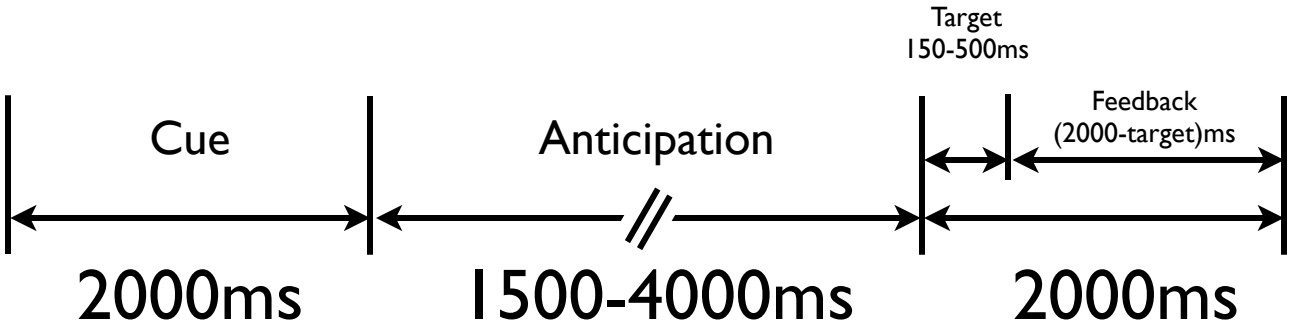

Fixed ***cue*** interval
Variable ***anticipation*** interval
Fixed combined ***target*** and ***feedback*** interval

Equal statistical support for each ***cue/anticipation*** interval
Geometric distribution of ***anticipation*** intervals
Five (5) trial types
Ten (10) trials per type
Equal representation in each run
No more than two (2) occurrences of same trial in a row
At least one (1) occurrence of each trial per 1/3 of run

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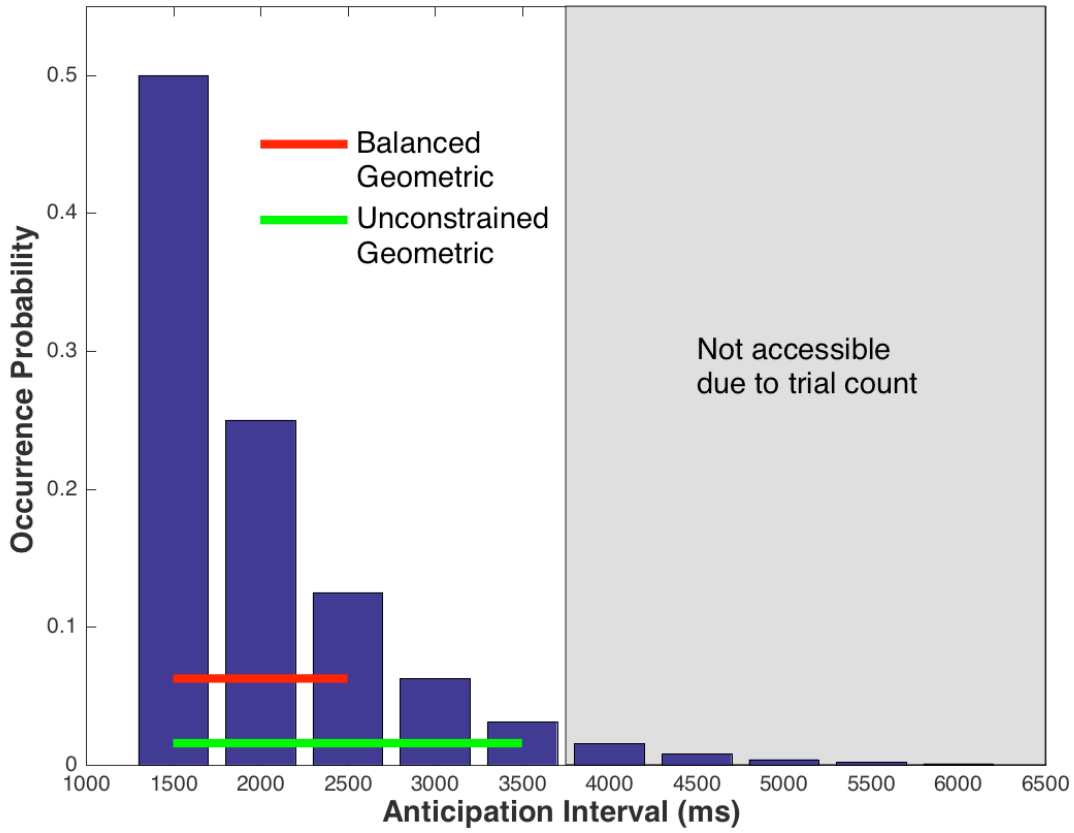
Due to the limited number of trials, the theoretical geometric distribution is not accessible.



With the constraint of equal (balanced) support, the distribution is more limited.

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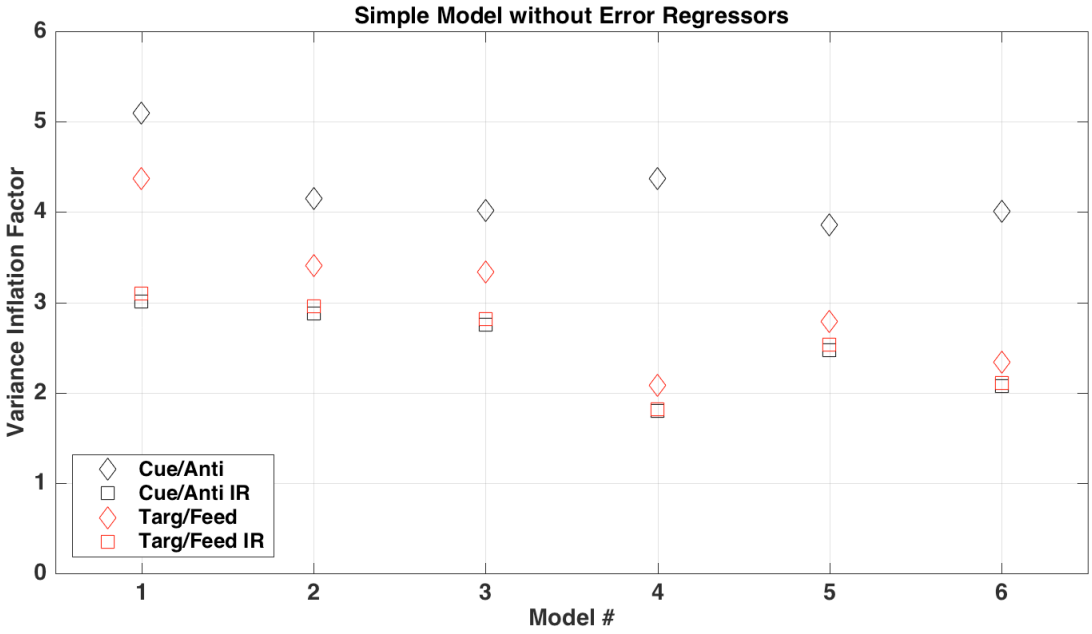
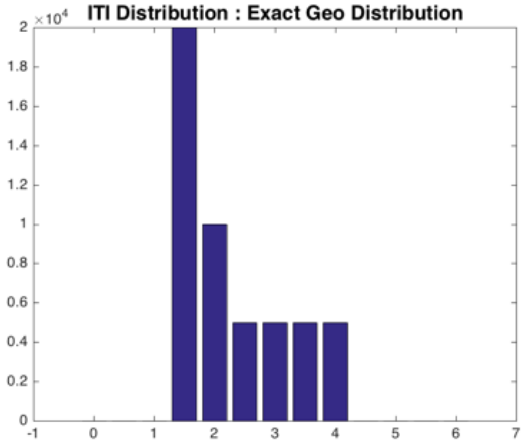
A total of 6 models were used for generation distribution of ***anticipation*** intervals.

1) Length of "Standard" experimental run 5.233 +/- 0.000
2) Length of "Geometric Balanced" experimental run 5.166 +/- 0.000
3) Length of "Geometric, No Constraint" experimental run 5.285 +/- 0.068
4) Length of "Flat distribution" experimental run 6.700 +/- 0.000
5) **Length of "Exact Geo Distribution" experimental run 5.500 +/- 0.000**
6) Length of "Exact Geo Long Distribution" experimental run 6.033 +/- 0.000



Anticipation interval distribution for "Exact Geo"



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Using constraints, randomized 1000 designs

ABCD requires a total of 16 experimental designs

Need to pick a collection of 16 experimental designs that are as far from each other as possible, using the maximum of the cross-correlation (up to a +/-20 TR lag) as the metric of distance. The inclusion of the lag will allow for moderate detection of designs that are simply phase shifts of each other.

Ran 1 million random sets of 16 runs from a randomization of 1000 runs. Ranked each set by the maximum cross-correlation present between runs. Took the set with minimum cross-correlation.

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Final designs are in:

final_mid_design_01.csv
final_mid_design_02.csv
final_mid_design_03.csv
final_mid_design_04.csv
final_mid_design_05.csv
final_mid_design_06.csv
final_mid_design_07.csv
final_mid_design_08.csv
final_mid_design_09.csv
final_mid_design_10.csv
final_mid_design_11.csv
final_mid_design_12.csv
final_mid_design_13.csv
final_mid_design_14.csv
final_mid_design_15.csv
final_mid_design_16.csv

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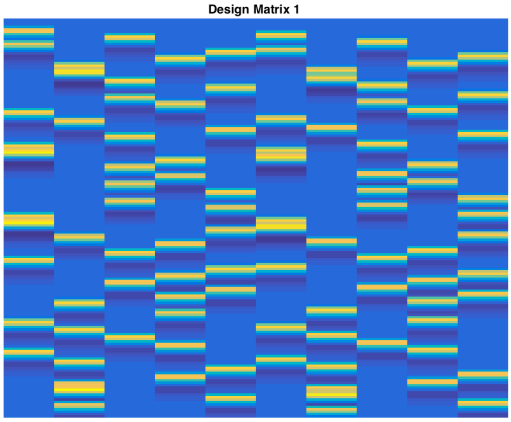
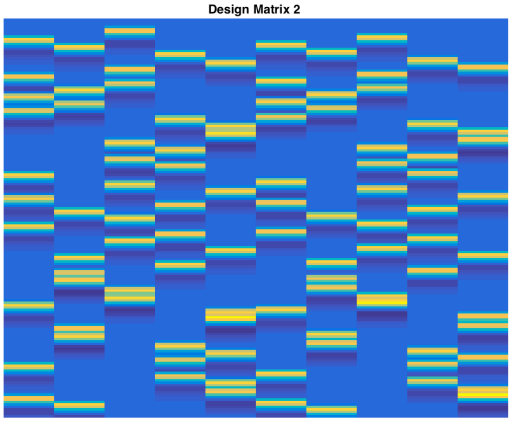
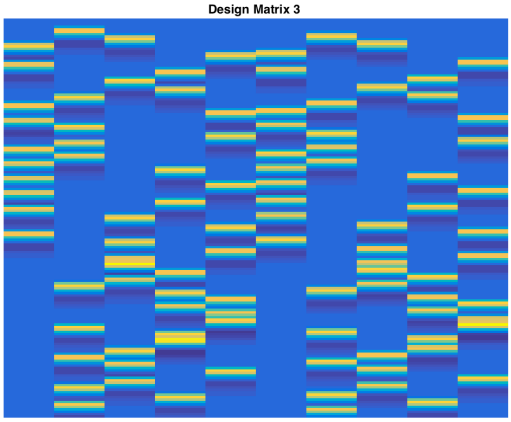
Design Matrix 1



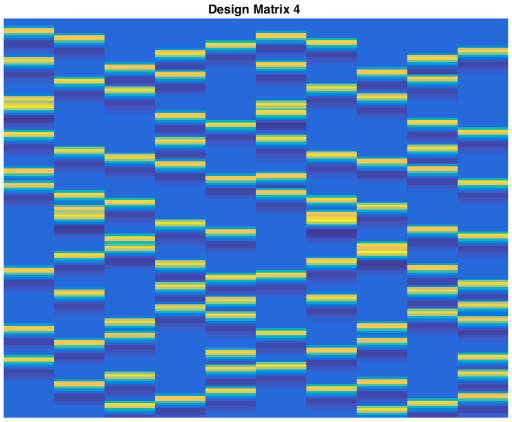
Design Matrix 2



Design Matrix 3



Design Matrix 4



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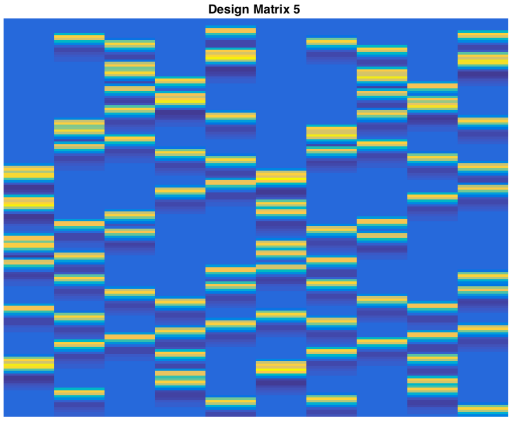

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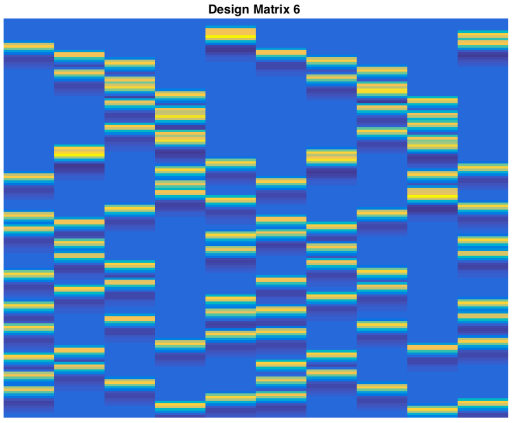
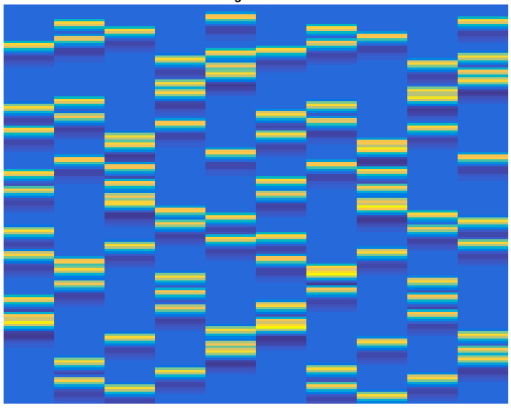


Design Matrix 7



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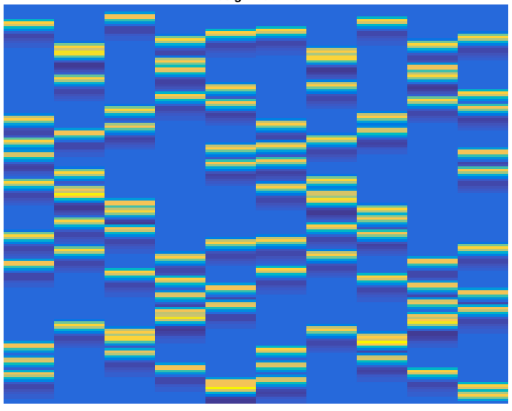

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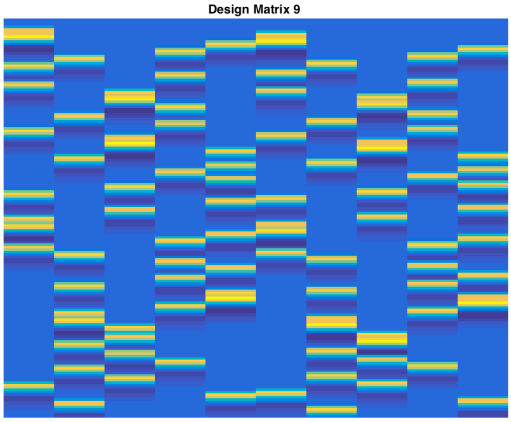
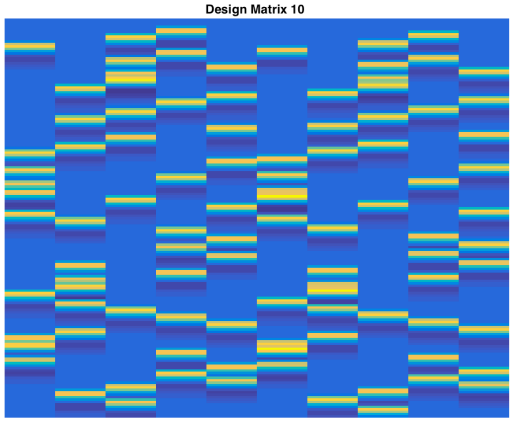
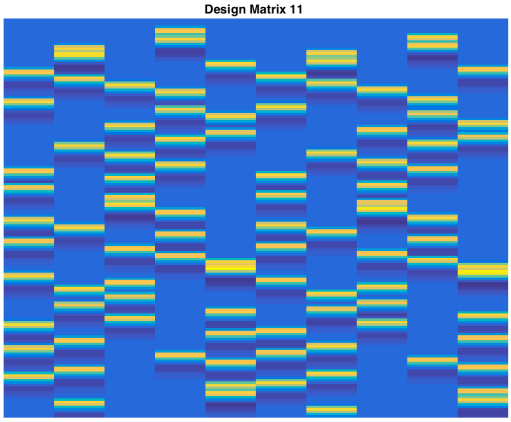
Design Matrix 9



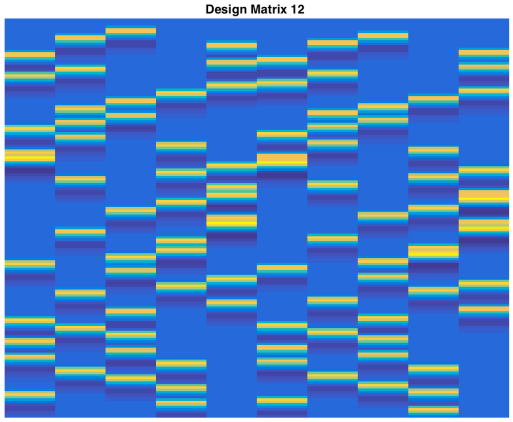
Design Matrix 10



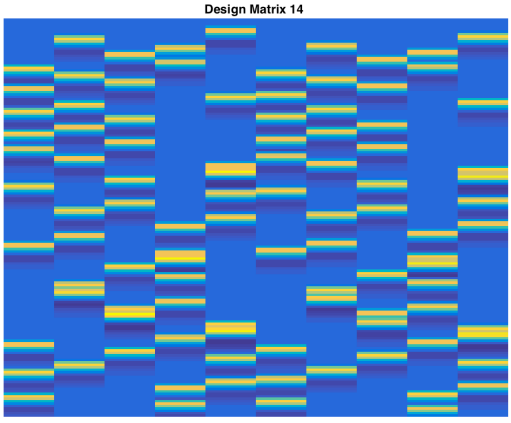
Design Matrix 11



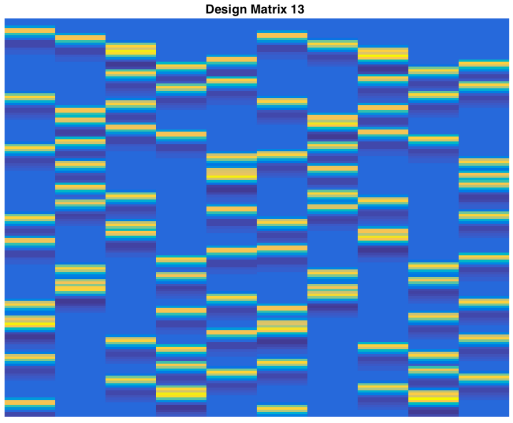
Design Matrix 12



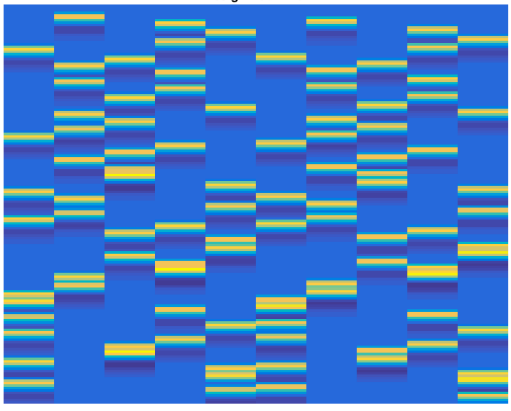
Design Matrix 14



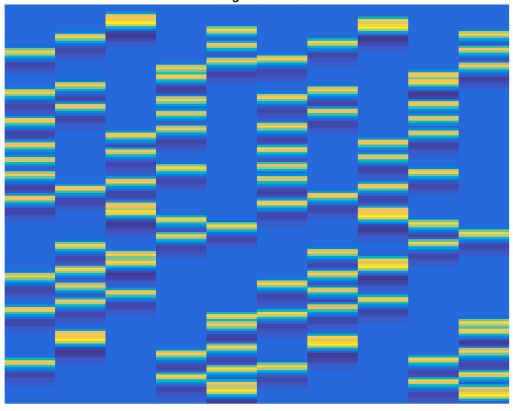
Design Matrix 13



Design Matrix 15



Design Matrix 16



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