



# NeuroDesign: optimisation report

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## Correlation between designs

During the optimisation, the designs are mixed with each other to find better combinations. As such, the designs can look very similar. Actually, the genetic algorithm uses natural selection as a basis, and as such, the designs can be clustered in families. This is the covariance matrix between the final 100 designs

This is the covariance matrix between the top 10 designs: 0, 10, 18, 22, 28, 35, 47, 66, 69, 77

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# Selected designs

The following figure shows in the upper panel the optimisation score over the different generations. Below are the expected signals of the best designs from different families, more specific and in relation with the covariance matrix, designs 0, 10, 18, 22, 28, 35, 47, 66, 69, 77. Next to each design is the covariance matrix between the regressors, and the diagonal matrix with the eigenvalues of the design matrix.

## Experimental settings

Repetition time (TR):	1.49					
Number of trials:	144					
Number of scans:	745					
Number of different stimuli:	6					
Stimulus probabilities:	0.25	0.25	0.125	0.125	0.125	0.125
Duration of stimulus (s)	6					
Seconds before stimulus (in trial):	0.0					
Seconds after stimulus (in trial)	1.0					
Duration of trial (s):	7.0					
Total experiment duration(s):	1110.0					
Number of stimuli between rest blocks	48					
Duration of rest blocks (s):	10.0					
	1					
	0					
	0					
	0					
	0					
Contrasts:	0					
ITI model:	exponential					
minimum ITI:	0.1					
mean ITI:	0.5					
maximum ITI:	5.0					
Hard probabilities:	False					
Maximum number of repeated stimuli:	8					
Resolution of design:	0.298					
Assumed autocorrelation:	0.3					

## Optimalisation settings

Optimalisation weights (Fe,Fd,Fc,Ff):	0.0	0.333	0.333	0.333
Aoptimality?	True			
Number of designs in each generation:	100			
Number of immigrants in each generation:	30			
Confounding order:	3			
Convergence criterion:	750			
Number of precycles:	1000			
Number of cycles:	500			
Percentage of mutations:	0.2			
Seed:	53330609			