Documentation for RRT Files

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circleEstimator(n,bins,COMP,COMQ,noiseM,noiseV,type)
Creates a simulation where the interviewees are asked to draw a circle where they would be comfortable answering. Making a peisewise distribution to grab the percent truthfulness from.

n: The size for each individual sample in a survey
bins: 1/bins is the increment for the trisurf graph for getShape(). The larger the more detailed
COMP: The center of the circles on the p axis
COMQ: The center of the circles on the q axis
noiseM: The mean of the Guassian distribution used for scrambling
noiseV: The variance of the Gaussian distribution used for scrambling
type: "H" for a Hill type simulation, "P" for a Peak type simulation, "Pl" for a Plateau type simulation.

getA(p,q)
Grabs A from the true distribution given a p and q.
p: The proportion the direct question will be asked in the survey
q: The proportion the indirect question will be asked in the survey

getNoisyA(p,q)
Grabs A from the scrambled distribution given a p and q.
p: The proportion the direct question will be asked in the survey
q: The proportion the indirect question will be asked in the survey

getShape()
Returns the distribution as a trisurf graph, must have a plt.show() at the end of your code.

getEstM()
Returns the estimated mean for the true distribution

getTrueM()
Returns the actual mean for the true distribution

getEstV()
Returns the estimated variance for the true distribution

getTrueV()
Returns the actual variance for the true distribution

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circleApproximator(Estimator, mode)
Creates the approximation of the truthfullness distribution using an estimator previously created, grabbing its mean and variance to create a normal approximation.

Estimator: A previously created circleEstimator Object
mode: "A" takes the absolute value of all normally generated values, "Z" sets all negative normally generated values to 0, "E" continuously generates negative values until they are positive.

getA(p,q)
Returns A from the approximated distribution given a p and q.
p: The proportion the direct question will be asked in the survey
q: The proportion the indirect question will be asked in the survey

getShape()
Returns the approximate distribution as a trisurf graph, must have a plt.show() at the end of your code.

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stdEstimator(bins)
Creates the standard truthfulness distribution

bins: 1/bins is the increment for the trisurf graph for getShape(). The larger the more detailed

getA(p,q)
Returns A from the standard distribution given a p and q.

p: The proportion the direct question will be asked in the survey

q: The proportion the indirect question will be asked in the survey

getShape()
Returns the standard distribution as a trisurf graph, must have a plt.show() at the end of your code.

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constantEstimator(a)
Creates the constant truthfulness distribution

a: The truthfulness percent regardless of p and q

getA(p,q)
Returns A from the constant distribution given a p and q.

p: The proportion the direct question will be asked in the survey

q: The proportion the indirect question will be asked in the survey

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mixedModel(n,epochs,tPi,zPi,mode)
Creates environment to run simulations

n: The size for each individual sample in a survey, 500 is standard

epochs: The repitions of each given p and q, 10000 is standard

tPi: The true proportion of the sensitive trait

zPi: The true proportion of the unrelated trait

mode: True for accounting for the truthfulness in estimator, False if not

run(p,q,a)
Runs a simulation with the parameters created in the environment for a specific p, q and a. Returns the MSE, var and bias for a particular simulation.

p: The proportion the direct question will be asked in the survey

q: The proportion the indirect question will be asked in the survey

a: The percent truthful for that given value of p and q

getMinPQ(bins,ceiling,aFunction,throughSim)
Finds the optimal p and q based on the parameters in the enviroment and a truthfulness function, returns the best p, q and MSE

bins: 1/bins is the increment for p and q for the trisurf graph for getShape() aswell as for which p and q will be tested. The larger the more detailed but longer to run.

ceiling: if a MSE exceeds this value then it will be capped at this ceiling, also become the upper bound for the z axis.

aFunction: a object with a getA(p,q) function, the truthfulness distribution.

throughSim: True if the values for MSE should be calculated through simulation, False if should be calculated with theorhetical variance and bias.

getShape()
Returns the Minimization graph as a trisurf graph, must have a plt.show() at the end of your code.

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getTrueMSE(n,tPi,zPi,p,q,a,mode)
Returns the theorhetical MSE, variance, and biased, based ff the following parameters

n: The size for each individual sample in a survey, 500 is standard

epochs: The repitions of each given p and q, 10000 is standard

tPi: The true proportion of the sensitive trait
zPi: The true proportion of the unrelated trait
p: The proportion the direct question will be asked in the survey
q: The proportion the indirect question will be asked in the survey
a: The percent truthful for that given value of p and q
mode: True for accounting for the truthfulness in estimator, False if not