The supporting materials include a few files:

**DataSimulatorByBCRW.R-** this is an R code that allow the user to create the simulation described in the paper, as well as other scenarios. Currently it produces the Paired design, and the user may change by adjusting the parameters in the first block of the code (e.g., the number of individuals, the simulation length etc.). The output of the code are 2 files describing the locations of the simulated agents, one of Matlab and one for R. the Matlab version can be used as an input for the Matlab code ProxBaseSocNetCode.m that contains the main method for randomization. It also creates an .Rdata file. (xyFromSimulationForSNanalysis\_5000\_60\_70\_7\_0\_.rdata, or similar, name changes with parameters used). This file is simply an R version of the same file as the mat above. It is not used further on and is not included here due to its relatively large size.

**xyFromSimulationForSNanalysis.mat-** this is the output of the R code. Can be used for the main Matlab code. Demonstrates the result of path randomizations on a population with known social structure.

**ProxBaseSocNetCode.m**- this is the main Matlab code. It gets as an input movement data from one of three sources: 1) lizards data (Lizards\_Data2010.mat), 2) simulation data (xyFromSimulationForSNanalysis.mat), or 3) user data (UserData.xlsx). This code runs the randomizations, calls two helper functions in Matlab for calculating the Social network (NetworkCalc5.m), and for creating the plots (FigMakerLizNtWrkRand1.m). The outputs are figures, and a .mat file with the randomizations full results.

**Lizards\_Data2010.mat**- a file that contains all locations of 60 tracked lizards from 2010. Used as an input for the main Matlab code.

**UserData.xlsx**- this file is a template for running the randomization method on user data. Currently it contains the lizards data, that should be replaced with the relevant data. The file contains the following columns:

* Individual - a numeric value for each individual, for instance the GPS number
* Time- this should be time in Excel format of HH:MM
* Date- this should be the date in Excel format of DD/MM/YYYY
* X,Y – these are the coordinate of the individuals at a given date and time. Don’t use Lat-Long system. Instead use UTM (Easting, northing), or any arbitrary coordinate system that provides a continuous location
* Sex- a numeric value, used only for display purposes. (1 for male or 2 for female).

Note that all columns should be at the same length.

Good luck

Orr Spiegel [orr.spiegel@mail.huji.ac.il](mailto:orr.spiegel@mail.huji.ac.il)