SYsTEm CHEAT SHEET

1. What is SYsTEm?

SYsTEm is a R shiny web application dedicated to archaeologists. Its aim is to easily simulate the formation of Palaeolithic sites.

Use SYsTEm at [app link]

2. How does it work?

SYsTEm is based on discrete-event simulation. This means that the state of the system (i.e. the site) is modified by events that are ordered in time. The 'return time' parameter is the probability of an event to occur at each time step (i.e. one year).

Events are:
- human occupation(s)
- carnivores occupation(s)
- sedimentary processes

A satisfactory replica of a site is called a 'syte'.

3. How to use it?

1. Fill in site informations about :
- name & location
- time : start & end dates (in BP)
- space : extent of the site & geomorphology

2. Indicate your hypothesis about human occupation of the syte. The function of the syte and occupation modalities are based on ethnographic models. During each occupation, objects associated within spatial (i.e. social) structures are abandoned.

3. Complete your hypothesis about sedimentary processes. Their action is governed by physical laws (hydraulics, soil mechanics and rheology). Sedimentary processes can deposit and erode sediment or move objects depending on their physical properties (size, shape and density).

4. Run your simulation.

5. Explore your syte, assess the entropy of the system (i.e. the degree of disorganisation of the spatial structures) and compare it with the real site.

5. Tutorial

A tutorial is available in the application.

You can also access a video tutorial at the following address [video adress]

6. About SYsTEm

SYsTEm is developped by Marc Thomas (University of Toulouse Jean Jaurès - UMR 5608 TRACES).

Find out more at [thesis adress]
Access the source code at [source code adress]
Report a bug at [link to github bug report]

Last version : 22.02.2024

If you use SYsTEm, please, cite :
- the application [doi]
- the dedicated article [doi]

4. Data

Paleoclimatic data is used to generate a theorical reservoir of species available in the environment over time and as parameters in physical equations (i.e. sedimentary processes). Referential size, shape and density measurements of lithics and bones are used to generate knapping and butchery clusters.

Syte formation generates a table of ordered and dated events and a table of remains containing all the objects left behind when the site is occupied.

Paleolclimatic 'Krapp2021'
- from pastclim R package
- temperature & precipitation
- 1000 years time step

Events
- time step (years BP)
- event order
- event type

Lithic remains reference
- knapping system
- size, shape, density

Bone remains reference
- species
- anatomical part
- size, shape, density

Syte remains
- time step (years BP)
- type (e.g. silex, fauna)
- x, y, z coordinates
- knapping system
- species
- anatomical part
- size, shape, density
- osl time

SYsTEm uses [cite R studio] and [shiny]