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Modelling Prehistorical Iconographic Compositions. The R package decorr

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Abstract

By definition, Prehistorical societies are characterised by the absence of a writing system. Prehistorical times cover more than 99% of the human living. Even if it is being discussed, first symbolic manifestations start around 200,000 BC (**?**). The duration from first symbolic expressions to start of writing represents 97% of the human living. In illiterate societies, testimonies of symbolic systems mostly come from iconography (ceramic decorations, rock-art, statuary, etc.) and signs are displayed mostlty a discontinuous figures which can have different relationships one with another. An graphical composition can be "read" as a spatial distribution of features having intrinsic values possibily having meaningful relationships one with another depending on their pairwise spatial proximities.

Keywords: Iconography, Prehistory, Graph Theory, Graph Drawing, Spatial Analysis, R.

concordance=TRUE

1. Introduction

Until our days, formal methods to study ancient iconography Semantics, has been mostlty been grounded (explicitly or not) on the prime principle of Saussurian linguistic: the 'linearity of the signifier' (**?**). Writing is one of the most rational semiographical system. With a clear distinction between signified and signifier – specially in alphabetic and binary writings – and the development of the signified on a horizontal, vertical or boustrophedon axis. Let us take the example of the word "`art`" which contains three vertices (`a`, `r`, `t`) and two edges (one between `a` and `r`, the other between `r` and `t`). In R, these features, concatenated in this order with a `paste0()`, is `art`, and not `rat`

```
R> library(igraph);library(extrafont)
R> par(mar=c(0.1,0.1,0.1,0.1) )
R> # loadfonts(device = "win")
R> # ugs <- data.frame(name=c("a","r","t"))
R> # lks <- data.frame(from=c("a", "r"),to=c("r", "t"),type=c("=","="))
R> # g <- graph_from_data_frame(lks, directed=FALSE, vertices= ugs)
R> g <- graph_from_literal(a-+r, r-+t)
R> # lo <- cbind(seq(-1,1,length.out = gorder(g)), 0)
R> plot(g,
+       layout = cbind(seq(-1,1,length.out = gorder(g)), 0),
+       vertex.color="white",
+       vertex.frame.color="white",
+       vertex.size=60,
+       vertex.label.cex=1.5,
+       vertex.label.color="black",
+       vertex.label.family="Courier New",
+       edge.arrow.size=.5)
```

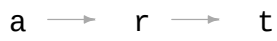

Figure 1: concatenate of `a`, `r` and `t` graphical units (GUs) is `art`.

But, as stated, in Prehistorical the writing system does not exists. Spatial relationships between graphical features, or graphical units (GUs) are not necessarly linear and directed but could most probably be more multi-directional and undirected: the direction of the interactions of pairwise GUs can be in any order.

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