



# Assessing functional diversity from traits to multidimensional indices

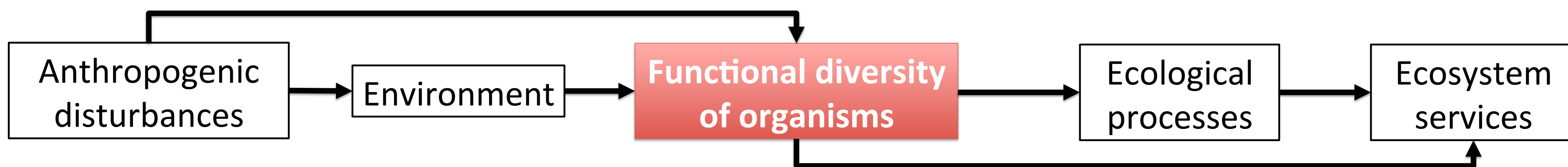
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## What is functional diversity ?

The *facet of biodiversity* that accounts for the *biological attributes* of organisms linked to their fitness or ecological roles, i.e. *functional traits*

## Why measuring functional diversity ?



### 1) Sampling assemblages

Assemblage matrix	Species			
	Sa	Sb	...	SN
A1	Presence/absence Number of individuals Coverage/Biomass			
A2				
...				
AC				

### 2) Measuring functional traits

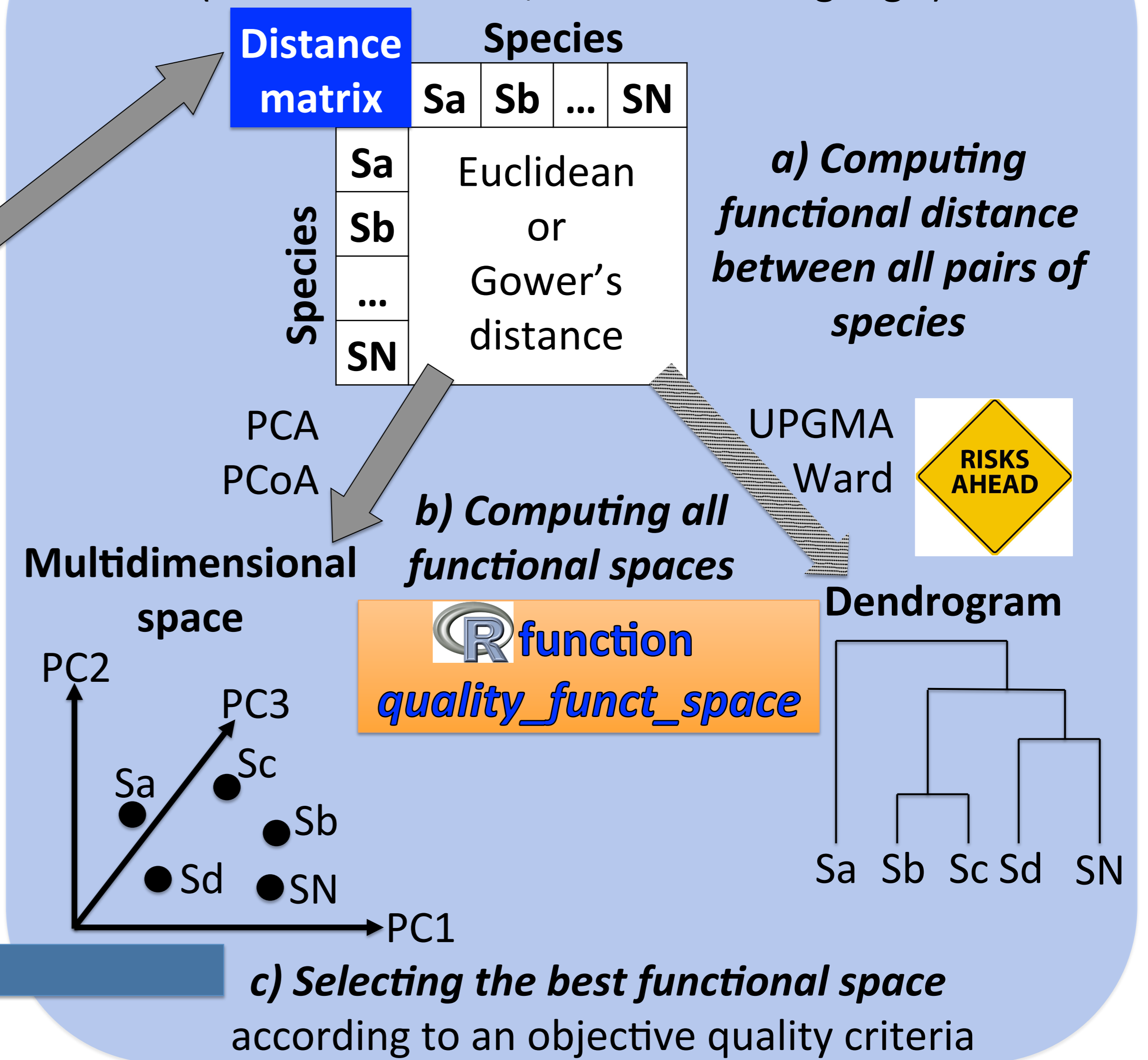
Your *question* + Your *expertise*

- a) Which functional traits
- b) How to *measure* them
- c) How to *code* them

Trait matrix	Functional traits			
	T1	T2	...	TT
Sa	Trait values			
Sb				
...				
SN				

### 3) Building a functional space

(Maire et al. 2015, Glob. Ecol. Biogeogr.)



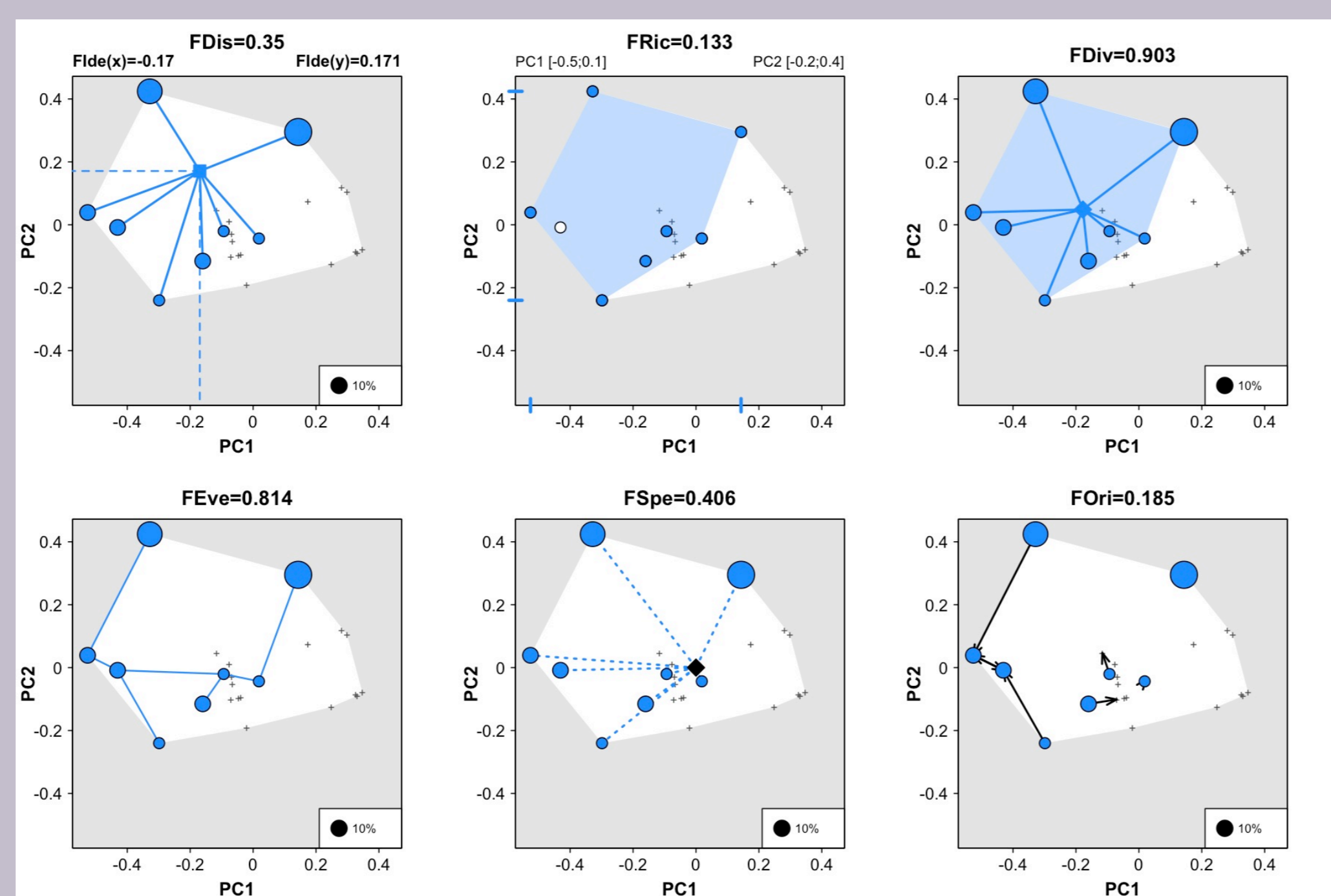
### 4) Computing complementary functional diversity indices

assessing distribution of species (and of their dominance) in the functional space for each assemblage (Mouillot et al. 2013, Trends Evol. Ecol.)

**function multidimFD**

Species coordinates

Diversity matrix	Indices		
	FRic	FEve	FDiv
A1	Indices values		
A2			
...			
AC			

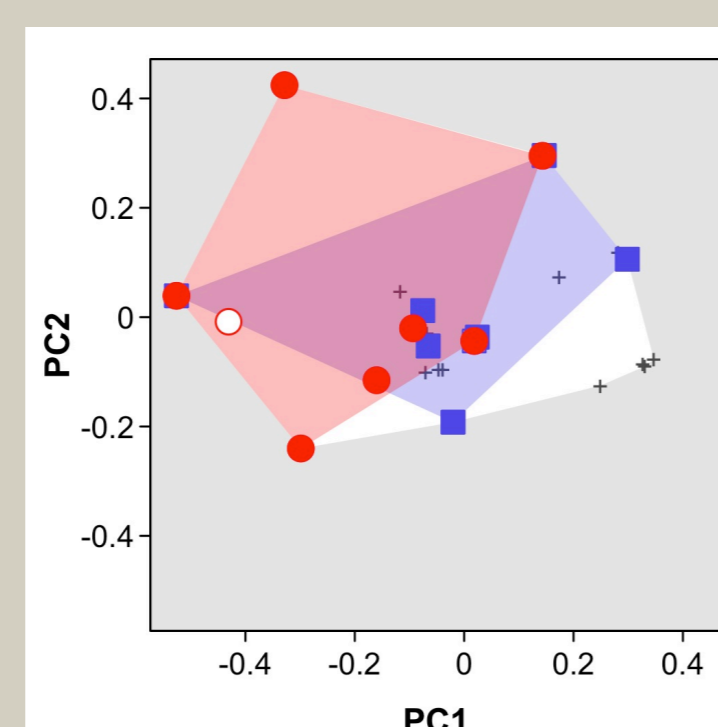


### 5) Computing complementary functional dissimilarity indices

assessing overlap in the functional space between assemblages (Villéger et al. 2013, Glob. Ecol. Biogeogr.)

**function multidimFbetaD**

Dissimilarity matrix	Assemblages			
	A1	A2	...	AC
A1	Dissimilarity values			
A2				
...				
AC				



Tutorial and functions available at:

<http://villeger.sebastien.free.fr/FD.html>

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