



# AIUCD 2021

## La Filologia come sistema dinamico: qualche considerazione preliminare

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### Main References

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### Idea

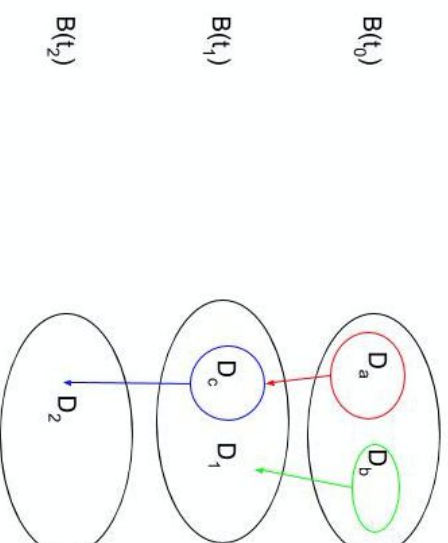
A mathematical model/framework for a formal approach to the evolution of documents with particular attention to the philological perspective and the typical related problems.

### Entities

- document  $D=D(c, f, p)$  (content, format, para-textual layers)
- operation  $op(\{D_1, D_2, \dots, D_n\}) \rightarrow \{D_a\}$  (takes a set, produces a single  $D$ : it makes  $D_x$  evolve into  $D_y$ )
- agent: a human or a tool that performs  $op$
- base-space  $B(t)=\{D_1, D_2, \dots, D_n\}$  (the set of  $D$  available at  $t$ )
- evolution-space  $H=\{(D_a \rightarrow D_b)^{c_{(op1)}}$ ,  $(D_b \rightarrow D_c)^{c_{(op2)}}\}$  (the set of evolutions from one set of documents to another at different times:  $H$  contains evolutions from  $B(t_1)$  to  $B(t_2)$ ,  $t_1 < t_2$ )

### Framework

Bundle  $E=B \times H$  ( $E$  is the total space.  $E$  relates each document in a  $B(t)$  to its evolutionary stories. The elements of  $E$  are document-evolution pairs. The process of "bundling" is iterable.)



Bundles between base-spaces (in black) and evolutions (various colors)

### Evolution as dynamic

Extract entities from a document and a list

$$op_1: \{D_{o_1} D_1\} \rightarrow D_1$$

$$B(t_0)=\{D_{o_1} D_1\}; B(t_1)=\{D_1\}$$

$$H=\{ev_1=\{(D_{o_1} D_1) \rightarrow D_1\}^{op_1}\}$$

$$E=B \times H = \{(D_1, ev_1)\}$$

Sources reconstruction

Suppose  $D_a$  (available at  $t_a$ ) is the result of an  $op$  on a set  $\{D_1, D_2\}$  (available at  $t_b < t_a$ ), the bundle theory defines an inverse of  $op$  ( $\sigma$ ) so that if we apply  $op$  after  $\sigma$  we obtain  $D_a$  again

$$D_a \rightarrow_{\sigma} \{D_1, D_2\} \rightarrow_{op} D_a$$

but if  $op$  is not completely known  $D_a \rightarrow_{\sigma} \{D_1, D_2, D_3, \dots\} \rightarrow_{op} D_b \sim D_a$

### Research questions

How much is  $D_b \sim D_a$  ?  
If the agent of  $op$  is human ( $a_n$ ), how much relevant are the knowledge ( $k$ ) and the external context ( $ctx$ ) in the process?

### Possible extensions

The components of  $D$  depend on  $k$  and  $ctx$

$$D=D(k, ctx)$$

$$c, f, p = c(k, ctx), f(k, ctx), p(k, ctx)$$