【CL1-1】

# Graph persistence

Mattia G. Bergomi[1], Massimo Ferri[2], Lorenzo Zuffi[2]

[1]*Champalimaud Foundation, Lisbon, Portugal,* [2]*University of Bologna, Italy*

The main concepts of persistence are extended to weighted graphs. Two main ways are explored:

1)  Various constructions of simplicial complexes out of sublevel subgraphs, filtered through the weight, and persistent homology of the resulting complexes. Here, particular attention is devoted to "dual" constructions (e.g. cliques and independent sets), which yield a form of extended persistence.
2)  Persistence of purely graph-theoretical structures (blocks and edge-blocks).

A natural distance for weighted graphs is defined and compared with distances between the various persistence diagrams obtained by the above processes.