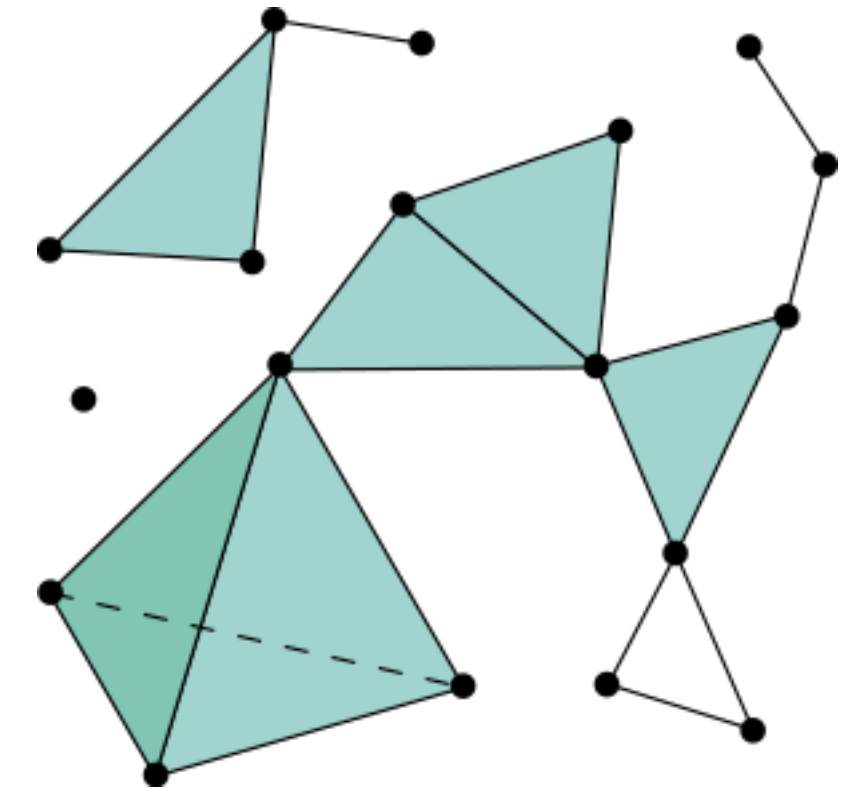


Learning on Simplicial Complexes:

From convolution to generative learning

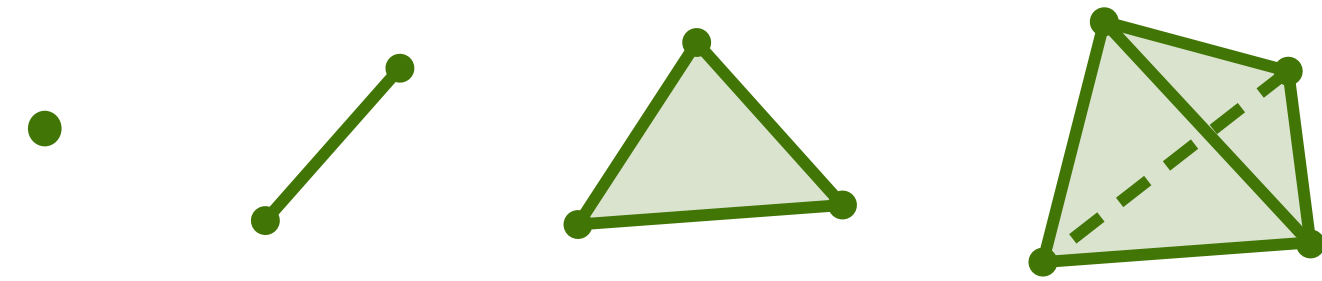


- lies in the field of topological machine learning
- learning: convolution, NNs, statistical models, generative learning
- simplicial complexes: a network model

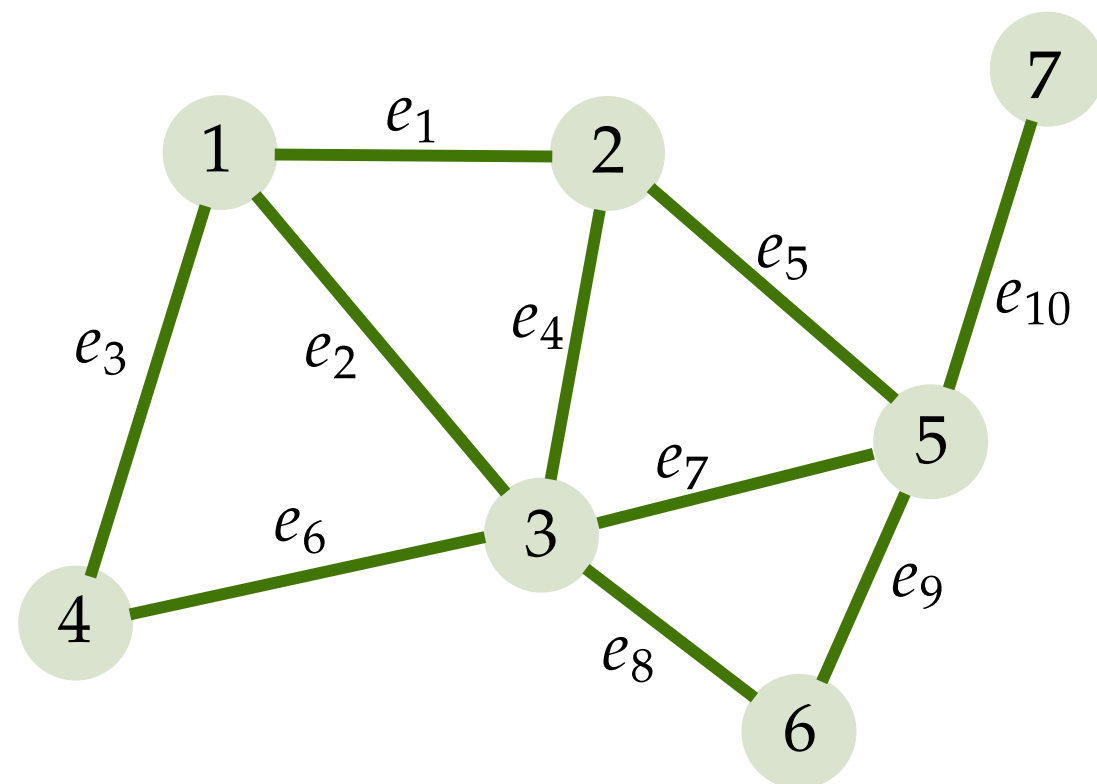
Maosheng Yang

Collaborators: Elvin Isufi (TU Delft), Geert Leus (TU Delft),
Viacheslav Borovitskiy (ETH Zurich),
Michael T. Schaub (Aachen)

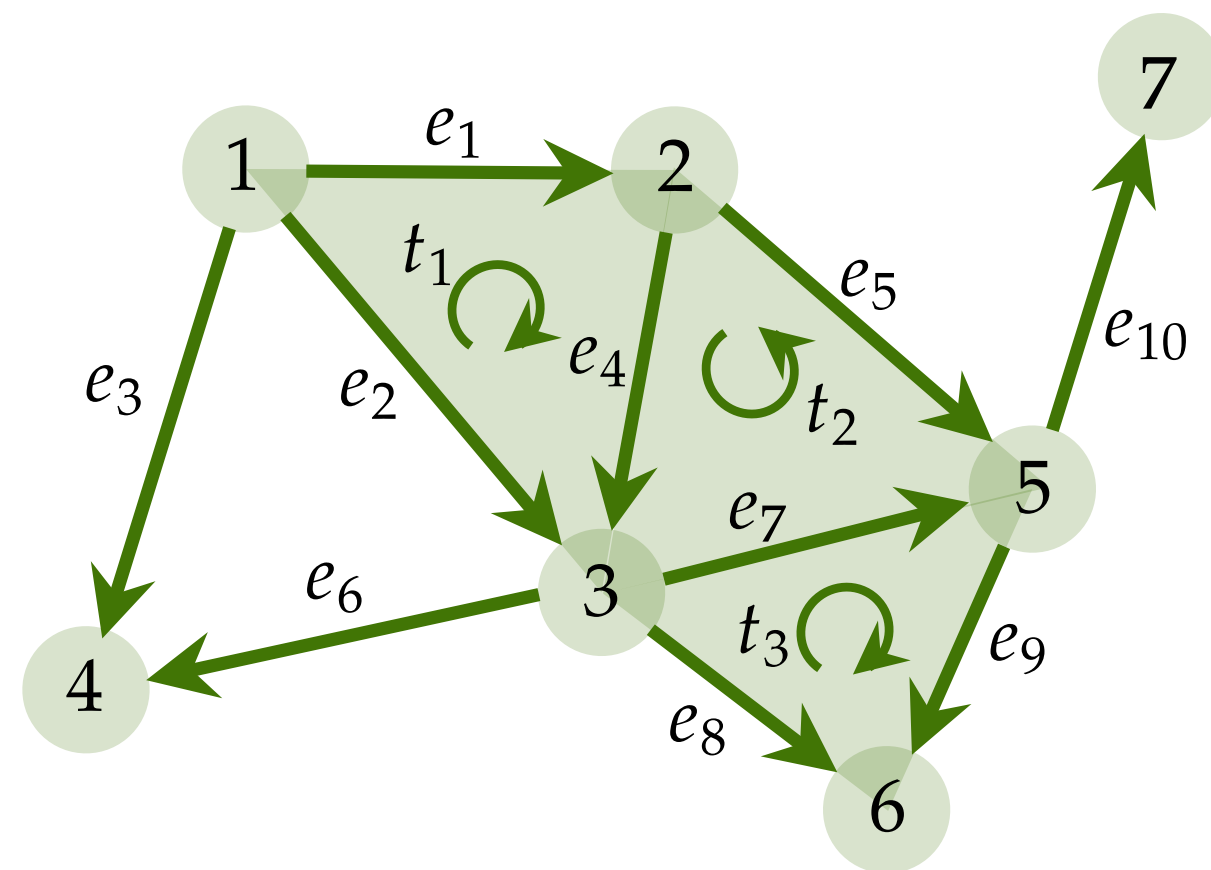
Graphs vs Simplicial 2-Complexes



0-, 1-, 2-, 3-simplices



Graph = Simplicial 1-complex



Simplicial 2-complex

- Oriented simplices (equivalence class of permutations)

Where are SCs used?

- Network analysis
- Topological data analysis
- Topological signal processing
- Topological deep learning
- Numerical methods
- Computer graphics
- ...

- To model Higher-order network structure
- To support Higher-order signals