# Graph Neural Networks for Digital Pathology

**Vincenzo DELLA MEA*, Hafsa AKEBLI, and Kevin ROITERO**

Medical Informatics, Telemedicine & eHealth, Dept. of Mathematics, Computer Science and Physics, University of Udine, Italy.
E-mail (*): vincenzo.dellamea@uniud.it

* Author to whom correspondence should be addressed;

## Abstract
Graph Neural Networks (GNNs), introduced in 2017, are a category of deep learning models specially designed to handle graph-structured data, allowing them to capture the intricate relationships and dependencies within complex data structures. The graph learning tasks can be either node-level, edge-level or graph-level. GNNs are well-suited for analyzing data such as social networks, molecular structures, and medical images, capturing both local and global patterns. The complexity and high dimensionality of medical images make them suitable for analysis using GNNs, which can leverage the relationships between elements in the data, offering a more complex and complete analysis that can improve both the accuracy and efficiency of medical image processing tasks such as classification, segmentation, and detection of abnormalities. This presentation will provide a summary of a systematic review we carried out to identify medical imaging areas where GNNs have been applied, with focus on their applications in histopathology.

**Keywords:** Graph Neural Networks (GNNs); Medical Imaging Processing; Digital Pathology.