Abstract: In this talk, I am going to introduce two main tools of Topological Data Analysis: persistence barcodes and merge trees. Both of them are tools to analyze geometric data by keeping track of topological changes along a family of spaces obtained from the data. Then, I will discuss a recent construction combining both, called Barcode Decorated Merge Trees. Joint work with J. Curry, H. Hang, T. Needham and W. Mio.