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Cliff Joslyn, Emilie Purvine* (emilie.purvine@pnnl.gov) and **Mark Raugas**. *Towards a Functorial Approach to Dynamic Topic Modeling*. Preliminary report.

Clustering methods and topic modeling are standard tools within data science for understanding large corpora of documents. Algorithms such as DBSCAN and non-negative matrix factorization (NMF) are well-studied for a static data set and frequently used. Additional work has been done on incremental updates to the clustering or NMF result when a corpus is evolving dynamically. Our interest is related to these incremental updates but takes it a step further. In the spirit of prior work by Carlsson and Memoli we aim to formalize learning methods generally using category theory and sheaf theory in order to combine results from different methods or different corpora. In this talk we will survey the landscape, summarize our first steps towards this goal, and explain why we believe the language of categories, functors, and sheaves is beneficial for the problem. (Received September 25, 2018)