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Mason A. Porter*, mason@math.ucla.edu. *Multilayer Networks and their Applications.*

In natural and engineered systems, entities interact with each other in complicated patterns that can encompass multiple types of relationships, change in time, and include other types of complications. Such systems can also include multiple subsystems and layers of connectivity, and it is important to take such ‘multilayer’ features into account to try to improve our understanding of complex systems. One way to do this is through so-called “multilayer networks”, a generalization of graphs, whose study has become the most prominent area of network science. In this talk, I’ll give an introduction to multilayer networks, discuss applications (including ecology, multimodal transportation networks, and social networks), and present some ideas for studying concepts such as community structure and centrality. I will include a possibly intriguing application of a multilayer representation of time-dependent networks to examine time-dependent ranking of United States mathematics programs based on a PhD exchange network. (Received June 30, 2017)