

Research on Networks in the AI National Lab Hungary

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I will briefly cover the activities of the Artificial Intelligence National Laboratory Hungary, a consortium of 11 institutions in the country that cover a wide range of research in AI theory and applications.

In the main part of the presentation, I discuss recent methods to analyze and model network data accessible as a stream of edges, such as interactions in a social network service, or any other graph data with real-time updates from a stream. First I introduce the data streaming computational model and give examples of the so-called temporal networks. I describe how low-rank approximation, network embedding, link prediction, and centrality algorithms can be implemented and updated while the edge stream is processed.

I show how dynamic network analysis techniques can be used in Twitter discussions to predict centrality, identify similar users, and classify for example anti-vaxxers. As another application, I show how the network of cryptocurrency transactions leak information on the identity of the participating users.

For most part, I provide sample data and implementation as Python codes packaged in a Docker image.