



# EP-IT Data science seminars

SPEAKER: Maximilian Nickel

TITLE: **Poincaré Embeddings for Learning Hierarchical Representations**

DATE: 28 Feb 2018, 11:00

PLACE: 503-1-001 - Council Chamber

## ABSTRACT

Abstracts: Representation learning has become an invaluable approach for learning from symbolic data such as text and graphs. However, while complex symbolic datasets often exhibit a latent hierarchical structure, state-of-the-art methods typically do not account for this property. In this talk, I will discuss a new approach for learning hierarchical representations of symbolic data by embedding them into hyperbolic space -- or more precisely into an  $n$ -dimensional Poincaré ball. Due to the underlying hyperbolic geometry, this allows us to learn parsimonious representations of symbolic data by simultaneously capturing hierarchy and similarity. We introduce an efficient algorithm to learn the embeddings based on Riemannian optimization and show experimentally that Poincaré embeddings outperform Euclidean embeddings significantly on data with latent hierarchies, both in terms of representation capacity and in terms of generalization ability.

Speaker Bio: Maximilian Nickel is a research scientist at Facebook AI Research in New York. Before joining FAIR, he was a postdoctoral fellow at MIT where he was with the Laboratory for Computational and Statistical Learning and the Center for Brains, Minds and Machines. In 2013, he received his PhD with summa cum laude from the Ludwig Maximilian University Munich. From 2010 to 2013 he worked as a research assistant at Siemens Corporate Technology. His research centers around geometric methods for learning and reasoning with relational knowledge representations and their applications in artificial intelligence and network science.

Organised by: M. Girone, M. Elsing, L. Moneta, M. Pierini.....  
\*\*Refreshments will be served at 10h30\*\*