Keynote: Can Knowledge Graphs Contribute to Personalized Therapies?

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Abstract

Data silos dominate the health sector, and relevant patient data is scattered across heterogeneous data sources and fragmented biomedical vocabularies. The data silos, more often than not, prevent a combination, analysis, and re-use of these data and thus forestall the evolution of invaluable insights for decision-making in healthcare.

This talk will position knowledge-driven ecosystems as powerful frameworks for integrating health data silos into knowledge graphs. Ontologies describe the meaning of the combined data, and mapping rules enable the declarative definition of the transformation and integration processes.

We will show the benefits of exploiting knowledge graphs and symbolic learning to uncover patterns contributing to a better understanding of lung cancer. Additionally, we will present neuro-symbolic systems on top of knowledge graphs implemented to predict the effectiveness of cancer treatment and the effects of drug-drug interactions. Lastly, we will discuss the lessons learned in developing the knowledge-driven ecosystems in the context of the EU H2020 project CLARIFY and their role in individualized decision-making.