

PhD in Information and Communication Technology for Health

Università degli Studi di Napoli Federico II

Module Title: Semantic artifacts and multimedia knowledge graphs for bio-data integration

Lecturer: Cristiano Russo

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CV (fino a 500 car.): Cristiano Russo is a post-doctoral researcher at the Department of Electrical Engineering and Information Technology, University of Naples. He is part of the IKNOS LAB and COSMO LAB at CNR IEOS-UNINA and he collaborates with Pattern analysis and Intelligent Computation for Multimedia Systems Lab (Picus Lab) at UNINA. Dr. Russo is program committee member of international conferences, and he contributes as a reviewer for several international journals and conferences. He has several publications in international conference and journals.

Dates and Locations (rooms are in building 3A, floor I, via Claudio 21, Napoli) TO BE CONFIRMED

Date	Hours	Room	Lecturer
11/09/2023	10:30-12:30	C2A	Cristiano Russo
13/09/2023	10:30-12:30	C2A	Cristiano Russo
18/09/2023	10:30-12:30	C2A	Cristiano Russo
20/09/2023	10:30-12:30	C2A	Cristiano Russo
25/09/2023	10:30-12:30	C2A	Cristiano Russo

Content

I Lesson (200-300 car.): Introduction to ontologies and OWL language.

Fundamental concepts of ontologies, Syntax and semantics of OWL, Utilizing OWL to represent knowledge domains.

TEACHING MODULE Announcement

II Lesson (200-300 car.): NoSQL Databases with a focus on Graph Databases

Overview of NoSQL databases and their characteristics, Key concepts of Graph Databases, Modeling and querying Graph Databases, Applications of Graph Databases in multimedia knowledge management.

III lesson (200-300 car.): Knowledge graphs and models for KGRL (Knowledge Graph Representation Learning) and KGE (Knowledge Graph Embedding). Definition and characteristics of Knowledge Graphs, Approaches for representation and learning of Knowledge Graphs, KGRL: Techniques for learning node and relationship representations in Knowledge Graphs, KGE: Methods for incorporating knowledge into continuous vectors.

IV Lesson (200-300 car.): Introduction to Knowledge Graphs with Python

Utilizing Python libraries for Knowledge Graph manipulation, Loading, exploring, and querying Knowledge Graphs in Python, Practical examples of using Python to analyze and visualize Knowledge Graphs.

V Lesson (200-300 car.): Creating a Knowledge Graph on biological data with ArangoDB (AQL and Python). Introduction to ArangoDB and its features, Modeling a Knowledge Graph with ArangoDB, Using AQL (ArangoDB Query Language) for data querying in the Knowledge Graph, Integration of Python with ArangoDB for importing, exploring, and analyzing data in the Knowledge Graph.

ECTS Credits: (0.2 per hour of lesson)

Notes

Doctoral Students are requested (starting from Lesson IV) to bring their own notebook with Python installed.

Doctoral Students with noticeable experience on this Module topics can participate as Tutors.

Participants to the Module (including those interested to the Tutorship positions) are requested to e-mail to the teacher with the following subject: Student name, name of the PhD course and cycle.

Info: **Dr. Cristiano Russo** – cristiano.russo@unina.it