

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

**DOTTORATO DI RICERCA / PHD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING**

Seminar announcement

13th December 2023, Time: 12:00 - 13:00

Room Seminari, Floor 1, Building 3, DIETI - Via Claudio, 21 - NAPOLI

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Energy-Efficient Data Science

Abstract: Non-renewable energy production and usage are the main factors in global warming and environment pollution. We argue energy consumption of computers (both servers and mobile devices) does contribute to environment pollution, albeit at a small percentage compared to other sources like power plants, vehicles and factories. Cloud IT centers use tons of energy. Energy is a key design consideration in edge computing including portable phones, portable computers, routers, especially when they are battery powered. Nowadays, AI is pushing computers and data analysis to limits we had not witnessed before, at the cost of energy-hungry computers. In this talk, we present an energy-centric

view of data science, starting with the natural environment considered as an external factor, ending up with computer internals: hardware and software. We identify which features, subsystems and components have a higher weight in energy consumption, understanding the tradeoffs impacting processing speed. We discuss major analytic tasks, going from data pre-processing to computing AI models. We explain current solutions to reduce energy consumption. Based on this spectrum view we highlight major research achievements and we outline our vision of a research agenda.

Lecturer short bio: Carlos Ordonez joined UH in 2006. Carlos Ordonez studied at UNAM University in Mexico, getting a B.Sc. in actuarial science and an M.S. in computer science. He continued PhD studies at the Georgia Institute of Technology advised by Edward Omiecinski, focusing on accelerating machine learning algorithms, getting the PhD in 2000. Carlos worked at NCR from 1998 to 2006, collaborating in the optimization of machine learning and cube query processing algorithms on the Teradata parallel DBMS. In 2006 Carlos joined the Department of Computer Science at the University of Houston, where he currently leads the Big Data Systems (BDS) lab.

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