AI for Healthcare and Biomedicine

Dr. Silvia Crivelli, Program Manager
Applied Computing For Scientific Discovery Group
Lawrence Berkeley National Laboratory, Berkeley, CA

Healthcare and biomedical research require AI technologies to analyze large volumes of multimodal data in order to create predictive models of health and disease as well as technologies that enhance the interaction between healthcare providers and patients. Through a partnership between the Departments of Energy and Veterans Affairs, the Berkeley Lab and other DOE labs are developing technologies to predict high risk for suicide and overdose, cardiovascular disease, and response to treatments, among others. We use electronic health records and genomic data to analyze the predictive and protective factors involved. Also, we are working on the integration of other factors that affect outcomes such as social and environmental determinants of health. We believe the latter will not only inform physicians and healthcare providers but also policy makers who need to quickly make decisions and allocate resources. In this seminar I will focus on 2 main areas that my group has been working on: developing Natural Language Processing (NLP) techniques to extract dramatic life events from medical notes. These events, like housing and job instability, social isolation and troubles with the law, are poorly diagnosed in the medical records but healthcare providers' notes are rich in information. We are also developing geospatial models to develop indexes of environmental and socio-economic vulnerability based on temperature, air quality, poverty, unemployment, crime, and many more datasets. I will highlight the potential and limitations of AI in these growing fields as well as the areas where more work is needed.

Friday, April 19, 2024, 11:00 AM

Please pre-register for the Zoom meeting at

https://us06web.zoom.us/meeting/register/tZwvfuGoqDMsHtNezs8XpFvUab8PbCA_De1S

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Dr. Silvia Crivelli

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I received my Ph.D. in Computer Science from the University of Colorado, Boulder in 1995. I was a postdoctoral fellow at the University of California, Berkeley and the Lawrence Berkeley National Laboratory (LBNL), where I began to work in computational biology. Currently, I am a Program Manager 2 at LBNL and an Associate Researcher at UC Davis.

I have been conducting research at the intersection of structural biology, high-performance computing, and applied math for more than twenty-five years. My research has two main goals: to bring scientists together, both seasoned and young and from all walks of science, to tackle long-standing, extremely hard, and multidisciplinary problems and to develop methods and software tools that empower physicians and researchers to predict the behavior of biological systems and, more recently, healthcare outcomes. I have been working together with biologists, chemists, computer scientists, physicians, and applied mathematicians. I am a co-PI of the DOE-VA Million Veterans Program that aims to integrate structured and unstructured data from electronic health records from more than 20 million veterans to develop patient-specific diagnostic strategies to improve healthcare for veterans. At the personal level, I was born and grew up in Argentina and followed an unconventional path to becoming a computational scientist.