A Quantum of Solace: Digital Traces and Mental Health

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Abstract: What does the Higgs Boson have to do with measuring the digital traces of mental health phenomena, such as depression, anxiety, or suicidal thoughts or behaviors? As it turns out, plenty. In this session, we will explore a useful metaphor for understanding physicists' discovery of the Higgs Boson after many decades. We examine the implications of this metaphor as a tool to develop a conceptual framework for the study of digital biomarkers, particularly with respect to those digital traces (and absences) that may reflect the range of biological, psychological, and social dimensions in mental health. However, even beyond the narrow confines of mental health, this conceptual framework underscores the need to deeply examine the ways in which we model the health phenomena being studied.

Bio: Dr. Vincent M. B. Silenzio's major area of interest is in the development of data science applications to study the biological, psychological, and social mechanisms relevant to suicide and injury prevention, and to the prevention and treatment of HIV/AIDS. His research has mainly targeted sexual minority youth and adult populations in the US, South Africa, Turkey, China, Hong Kong, and South East Asia. Another current focus is on the development of integrated machine learning and mobile health applications to study or target behavioral factors in diseases such as HIV/AIDS, and to develop interventions using machine learning and crowd-computational approaches to target "hidden" or difficult-to-reach populations. In addition, Dr. Silenzio leads an NIH-funded eCapacity Program that trains researchers from low- and middle-income countries in the Asia and Pacific region in data science and mHealth research applications.

His major scientific accomplishments include the development of network analytic methods to conduct very-large-scale studies of "hidden populations"; and the development of fine-grained predictive models of disease spread using machine learning and human computation techniques applied to flu-like illness, foodborne illnesses, depression, and suicidal ideation.

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