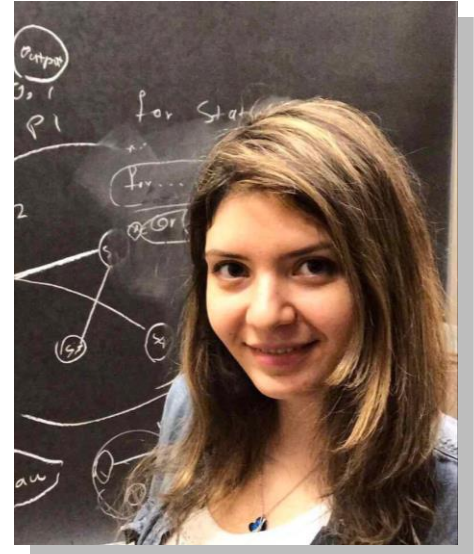# CoCo Seminar Series Fall 2017

Schizophrenia As a Complex System: Insights from Network Science

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Wednesday, November 29th, 2017   8:30-9:30am
Engineering Building H-9 (Knoll-MacDonald Commons / Watson Commons)

Schizophrenia is a severe psychotic disorder and the number one cause of medical disability with an estimated annual cost of $62.7 billion in the US. One of the main challenges in diagnosis and prognosis of schizophrenia, like most psychotic disorders, is the manifestation of various symptoms and the way they influence each other. In this regard, studying schizophrenia as a complex network of interacting components (i.e., symptoms, emotions) could potentially provide new insights and a better understanding of schizophrenia.

Within this symptom interaction network framework, antipsychotic medications act as external agents that change different properties of the network. Hence, in the first part of my talk, I will describe static modeling approach that used to study the change of symptoms network after antipsychotic treatments at microscopic, mesoscopic and macroscopic levels. I will show that some of the symptoms play a major role in responsiveness of the patients to antipsychotic medications.

Next, I will describe stochastic-dynamical modeling approaches to model the temporal dynamics of emotions and characterize the emotional abnormalities of schizophrenia. The primary goal of this part is to gain more insights into the underlying mechanisms of schizophrenia, and I will show that analyzing the temporal dynamics of emotion is vital to achieve this goal. For instance, our results indicate that the intensity of positive emotions in schizophrenia patients does not remain over time to the same extent as the control group.

Farnaz Zamani Esfahlani is a Ph.D. candidate in the Systems Science program at Binghamton University. Her research interests include network science, dynamical/stochastic modeling, machine learning, computational psychiatry, and network neuroscience.

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