

Submission for Research Day – Friday, April 2, 2021
Submit to abstracts@uvawise.edu no later than March 12, 2021

Name: Smith Georgia Lynn
(Last) (First) (Middle)

Co-author/s _____

Title of presentation/poster or creative activity: Identification of Latent Networks in Psychiatric Comorbidity Using Recurrent Neural Networks

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Academic major: Mathematics/Computer Science Expected date of graduation: May 2021

Mentoring professor: James Vance

Have you given this presentation/poster at a conference? no

x	Oral presentation	Poster
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Abstract or description of creative activity (250-300 words):

Mental illness can be a burden for those whose lives are impacted from it, especially those with serious mental illness. This burden is exasperated when multiple mental illnesses co-occur - a phenomenon known as psychiatric comorbidity (further referred to as comorbidity). Recently, the field of psychometric analysis, or the analysis of psychological measurement techniques and theories, has had two major ideas of how to analyze comorbidity: a latent variable perspective and a network perspective. We extend Cramer et. al.'s (2010) initial hypothesis of the usability of network analysis to latent network path analysis, identifying pathways of comorbidity to identify causal symptoms of disorders. We will do this in a multi-stage production. First, we will develop networks of individuals in the NCSR building directed graphs based on the onset age of symptoms. Then, we will combine all of the networks for individuals with a comorbid diagnoses using Deep Diffusion Process (Qian et. al., 2020) (DDP) a Long Short-Term Memory (LSTM) Recurrent Neural Network (RNN) technique based on Hawkes Processes. We then compare these networks with networks of non-comorbid diagnoses to identify bridge symptoms and symptom pathways unique to comorbidity.

Please attach a short biography (3-4 sentences)

I am finishing my 3rd year at UVA Wise and plan to graduate this spring. I am a dual major in Mathematics and Computer Science and have done research on Atrial Fibrillation using data science in the past. Next fall I plan to continue my education getting a Doctorate in Biostatistics at the University of Colorado's Anschutz Medical School.