I would like to nominate Alexander Titus for the Epidemiology Trainee Travel Award. Alexander is a 3rd year PhD candidate in my lab focusing on methylation-based data science of breast cancer.

Alexander was recently invited for an oral presentation of his paper titled *“A New Dimension of Breast Cancer Epigenetics: Applications of Variational Autoencoders with DNA Methylation”* at the 9th International Conference on Bioinformatics Models, Methods and Algorithms, in Madeira, Portugal this January.

In this work, Alexander presents the first deep learning based analysis of methylation microarray data, setting the stage for wide range of future applications. Despite the recent surge of interest in deep learning, biologist have been slow to adopt these methods due to the challenging interpretation of the underlying processes that comprise deep learning architectures. In this recent work however, Alexander has recapitulated a tumor classifier that can separate molecular subtype, concordant with the widely accepted PAM50 gene expression subtypes. Alexander’s broader scientific goals are to develop methods that expand data usage through integration methods and to demonstrate the utility of these deep learning methods to the biology community.

The model Alexander developed is also known as a generative model, one which artificial data can be generated from the learned underlying data distribution. Perhaps more importantly than the tumor classification, this may be the ground work for a tool that can expand sample sizes for training machine learning algorithms based on this data.