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Alyssa Hope Columbus* (acolumbu@uci.edu). *Probabilistic Models, Machine Learning, and the Future of Breast Cancer Risk Assessment.*

With 1 in 8 women in the United States at risk of being diagnosed with breast cancer at some point in her lifetime, the development and accuracy of breast cancer prediction models is pertinent to reducing the morbidity and mortality rates associated with the disease. Three such prediction models are the Gail, BCSC (Breast Cancer Surveillance Consortium), and Tyrer-Cuzick models, each of which determine a woman's risk of breast cancer from risk factors including family history of cancer and mammographic density. However, these models have been shown to vary in accuracy among women with different ethnic backgrounds, which is why the Athena Breast Health Network, an extensive program at UCI that integrates clinical care and research to drive innovation in the prevention of breast cancer, is building and testing new breast cancer risk assessment models using machine learning. Experimenting with algorithms such as k-nearest neighbors (KNN), support vector machines (SVM), and decision trees (DT), Athena hopes to evaluate new breast cancer risk models and their predictive accuracies. (Received September 26, 2017)