



## CBCB SEMINAR

9/13/2021

3:30-4:30PM

AP BioPharma

Room 140

(590 Avenue 1743)

or via ZOOM:

<https://udel.zoom.us/j/93442313974>  
bioinformatics.udel.edu

# BIOINFORMATICS SEMINAR

## YASAMAN MOGHADAMNIA

*PhD Student, Department of BME UNIVERSITY OF DELAWARE*

### THE GRADUATE STUDENT TRAVEL AWARD EXPLAINED

As described in the graduate college website of UD, the Graduate Student Travel Award is supported by the Office of the Provost to help University of Delaware graduate students participate in significant professional conferences pertaining to their field of study. Conference travel is essential to the academic growth and development of graduate students. It affords opportunities for presenting student work in a professional setting and for networking and exposure to the latest academic research. Yasmin Moghadamnia was awarded this travel award in her first year of PhD studies, specifically to attend “The Virtual Bioinformatics Workshop on Differential Gene Expression (DE), Metagenomics and Visualization” at NCGR (National Center for Genome Resources) in New Mexico, in March 2021. She will discuss how the application process is carried out, things that must be included in your letter of recommendation, how the virtual workshop was conducted and a summary of what was discussed, a guide to how to write a blog entry as the travel award winner and resources to reach out to for the award.

## QING ZHANG

*MS Student UNIVERSITY OF DELAWARE*

### ESTIMATING A COST-EFFECTIVE INDIVIDUAL TREATMENT RULE (CEITR) BASED ON MACHINE LEARNING

Policy makers employ Cost-Effectiveness Analysis (CEA) to evaluate a new treatment based on its cost and effectiveness. Individual Treatment Rule (ITR) is the treatment recommendation based on patient’s characteristics. However, the recommends generated from ITR and CEA could mismatch, even opposite since their aim is different. Therefore, policy makers need a tool to trade-off between ITR and CEA. Traditionally, optimal ITR focus on the mean benefit on population level, not on individual level. In the era of precision medicine, an ideal intervention needs to be optimized based on individual level.

Here a composite outcome, Net Monetary Benefit (NMB) which integrates the clinical benefits and corresponding cost, is adopted to address the optimization of the cost-effective ITR. ITR is taken as a function of patients’ characteristics that, when implemented, optimizes the allocation of limited healthcare resources by optimizing clinical benefits while minimizing treatment-related costs. Applying machine learning approach –conditional random forest and others (such as XGBoost), we can consider ITR and CEA jointly on individual level to estimate a Cost-Effective ITR(CE-ITR) and apply it to real world clinical data.

