Annual Report 2019-2020
Dave House Endowed Professorship
in Statistics, Data Mining and Data Analytics
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This is 2019-2020 annual report to describe the research activities that were supported by the funds from Dave House Endowed Professorship in Statistics, Data Mining and Data Analytics. I would like to thank the generous endowment from Mr. Dave House. His continuous support to Michigan Technological University and to Department of Mathematical Sciences has significantly improved the learning experience of graduate students in my department.

Between December 2019 to November 2020, the funds generated from this endowment were solely used to pay the stipend and for Cheng Gao, a PhD student in statistical in Department of Mathematical Sciences. With this fund, Mr. Gao was able to focus on his research. Mr. Cheng completed a project on developing a statistical method that can detect the association between multiple genetic variants and multiple trait using family data. Mr. Gao implemented the developed method to a R program, conducted simulation studies to evaluate its performance, and applied it to The Genetics of Kidneys in Diabetes (GoKind) study to illustrate its usefulness, prepared and submitted a manuscript titled “MF-TOWMuT: Testing an Optimally Weighted Combination of Common and Rare Variants with Multiple Traits Using Family Data.”. The manuscript was accepted by Genetic Epidemiology in 2020 fall and was published in a recent issue of the journal.

Mr. Gao started working on a project on eQTL mapping. There are many challenges in eQTL mapping but Mr. Gao was able to propose a new penalized regression model to tackle some of those difficulties. Mr. Gao developed and implemented the optimization algorithm to efficiently estimate model parameters, conducted extensive simulations, and performed the real data analysis, and prepared a manuscript titled “LORSEN: fast and efficient eQTL mapping with low rank penalized regression”. We expect to submit this manuscript for review in near future.

As the holder of Dave House Endowed Professorship in Statistics, Data Mining and Data Analytics, I would like to take this opportunity to highlight some of my achievements during December 2019 to November 2020. With respect to teaching activities, I have taught 6 courses including two online courses, been advising one MS student and three PhD students, developed two online courses for the MS program in Applied Statistics. The MS program in Applied Statistics is quite successful and has attracted many students. With respect to research activities, I have published three peer-reviewed papers and submitted two manuscripts for publication and has submitted one grant as co-PI. An R15 grant from NIH that I serve as a co-investigator was funded in 2020 fall.

In 2021, I am planning to use the funds to continuously pay the stipend and tuition and part of travel expense for Cheng Gao. Mr. Gao will continue on his work on statistical genetic and genomics. He is a bright and hardworking scholar and has the potential to make an impact in his research area. I will identify and support an additional PhD student in statistics if there are sufficient funds left after I support Cheng Gao. Again, I would like to thank the generous support from Mr. Dave House. Without his continuous support, it would not be possible provide such wealth of learning opportunities to our students.