Department of Electrical Engineering and Computing Systems
COLLEGE OF Engineering and Applied Sciences

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 2, 2015

The Department of Electrical Engineering and Computing Systems is pleased to offer the following research project for the summer of 2015. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

PROJECT TITLE: Multi-Dimensional Data Clustering

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Project Description

Recent changes in medical records keeping requires that patient data be recorded electronically. This is both an opportunity and a concern. Having additional data available for analysis makes it possible to achieve a greater understanding of successful diagnostic and treatment capabilities which should enhance the quality of life of all. However, the electronic availability of patient data is also a privacy concern. Thus, we require techniques to support data analysis of all patients in multiple databases without compromising their privacy. Thus, too protect patient privacy, we must discover techniques to enable that analysis across multiple databases without requiring the exchange of non-relevant patient data.

In this project, we use random projection methods to identify related data points in the different databases. Since we use random projection matrices, we are able to perform this analysis using only random seeds to populate the matrices. From the random projections, we compute hash values and counts of those hash values. Only the hash value and counts are exchanged, thus preserving the privacy of the patient data. In this project the student will be expected to develop and use python scripts to exercise the random projection tools against sample test data. Suitable candidates for this project should have strong programming skills in C, C++, or python.