Developing a tool for early detection of cancer

Mentor: Subhajyoti De, PhD, Rutgers Cancer Institute of New Jersey

Field(s) of Research: Computer science, Statistics, Biology

Project Summary:

Most cancer patients die because their cancer is detected at a late stage when the disease is already aggressive. Sensitive early detection of cancer, preferably using a non-invasive method such as blood test could help improve clinical management of cancer patients. Fragments of cell-free DNA from tumor and normal tissues can be detected small amounts in blood. By analyzing mutations in the cell-free DNA it is possible to predict if the donor has cancer. However, a major challenge is to determine the likely organ of origin of the tumor, which this project aims to address. We will analyze DNA sequencing data from many patients using computational and statistical approaches to predict who might have cancer and what type of cancer. An interested student should have a background in computer science, mathematics, statistics or data science, with some interest in biology. Experience of programming using python and R are required. Training in biology or cancer research is not needed, but could be a plus. Successful completion of this project will result in a genomic resource for sensitive, early detection of cancer.

Applicant GPA and other requirement(s): 3.6 GPA

Applicant responsibilities: please discuss with researcher if invited for interview