MCEH Summer Internship 2019

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<tr>
<th>Internship title</th>
<th>Interactive Interface for Optimization and Healthcare Database Intern</th>
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| Reports to       | Prof. Kimia Ghobadi  
|                  | Center for Systems Science and Engineering  
|                  | Department of Civil Engineering |

**Internship purpose**

The intern will work on a healthcare database and optimization project, and will interact with faculty, students, and data stewards at Johns Hopkins University, and possibly other institutions. The intern will be responsible for creating interface for complex modeling problems. In addition to programming skills, the intern should be proficient at integrating and preparing large datasets, communicating results, and understanding mathematical modeling. The research project will be divided into two phases of a) creating an interactive interface for a scheduling optimization, and b) designing an interactive interface for a large healthcare database and show case analytical results.

The student will acquire theoretical and practical knowledge in mathematical modeling, analytics, and healthcare databases. The student will obtain hands-on experience with healthcare databases and their unique challenges. The project will prepare the student to showcase their knowledge in core computer science and analytics and operations research. The developed visualization tool will be used by real-world users and researchers. The aim of the project is to integrate visualization into Healthcare operations research problems to create systems that transform raw data into information providing evidence for medical and operational decisions, organizational strategies, and policy-making.

All Malone Center interns are expected to create a poster and present the results of their internship at the Johns Hopkins Research Symposium on Engineering in Healthcare, Nov 2019

**Short Project Description**

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<th>Research Project</th>
<th>Interactive Interface for Optimization and Healthcare Database</th>
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<td>Description</td>
<td>Improving the efficiency in Healthcare systems is a highly active research area with strong interest from clinicians, engineers, scientists, and policy-makers. However, the implementation of such research is restricted partly due to the lack of appropriate interfaces. A good interface can handle the large healthcare database (e.g., healthcare data from the emergency department) and present relevant data and insights in a manner that are easily understandable and actionable.</td>
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| Tasks            | Week 1-2: Scoping the Problem—literature review of methods and application areas  
|                  | Week 3-5: Developing an interactive interface for scheduling problems  
|                  | Week 6-9: Understanding healthcare database and create a map of interactive interface for various analytical insights  
|                  | Week 10-12: Developing and refining the interface for the healthcare database |

| Required Skills  | Strong programming skills. Knowledge or prior experience of databases and visualization. Strong background in mathematical programming (applied mathematics in general). |
Qualifications

• Bachelor’s degree in mathematics, computer science, or relevant fields. Graduate students preferred. Strong undergraduate students will be considered
• Proficient in programming, visualization, and data base skills
• Strong background in optimization, machine learning, and analytics
• Must demonstrate strong critical thinking and analytical reasoning skills
• Prior experience with databases and developing interfaces is desired but not necessary
• Ability to execute assigned project tasks within established schedule
• Possesses sound documentation skills; writes and communicates clearly and concisely
• No previous research/industry experience required.

Working conditions and physical requirements

Indoor- shared office environment
Possible exposure to clinical setting (observing workflow)
Ability to physically operate computer required
May need to lift up to 20 lbs

Compensation

$13/hr up to $6,500 depending on schedule and duration

Anticipated Start Date

June, 2019

Duration

Summer Semester, 2019
Possibility for extended internship depending on performance, project need and interest on both sides

Location

The Johns Hopkins Homewood Campus, 3400 North Charles Street, Baltimore, MD 21218

Application Process

Email your resume and one paragraph describing what you are looking to gain from this internship to Vess Vassileva-Clarke: vclarke@jhu.edu.

Please include the name, email address and/or telephone # of your academic adviser (the faculty member who advises you).

Use Subject line “MCEH Interactive Interfaces Internship- Summer 2019” for your email.

Applications received on or before May 5, 2019 will be given first consideration.