

# Improving Performance in Heterogeneous High-Performance Computing Systems

## PROJECT DESCRIPTION

Our research group current focus is on the use of accelerators to improve the performance of high-performance computing systems. We are currently investigating the performance of computing in systems that combine CPUs with GPUs and FPGAs. Our focus is on compiler transformations that improve the performance of applications on such systems. We have recently successfully integrated interns in our research process. Interns have implemented code transformations, investigated the changes in performance caused to systems when the workflow to produce the executable for an application is varied, and have also successfully create models to predict the performance of various applications on GPUs. Specific project goals are defined prior to the arrival of the interns and background material is sent to them prior to their arrival in the lab. Besides the Principal Investigator, interns are paired with experienced graduate students and also participate in group seminars where we discuss relevant research publications.

## FACULTY-DEPARTMENT

Faculty of Science - Computing Science

## DESIRED FIELD OF (STUDENT) STUDY

Solid programming and mathematical background, good knowledge of computer systems including operating systems, compilers, and programming languages is required. Knowledge of accelerators such as Graphics Processing Units (GPUs) and Field Programmable Arrays (FPGAs) would also be desirable.

## INTERNSHIP LOCATION

University of Alberta Main Campus - Edmonton

## NUMBER OF INTERNSHIP POSITIONS

2

## INTERNSHIP START DATE

July 4<sup>th</sup>

Contact: Brendan Cavanagh, Internship Coordinator (Inbound)  
University of Alberta International  
intern@ualberta.ca

## INTERNSHIP END DATE

October 1st

## ARE THE DATES FLEXIBLE?

Yes, I am flexible regarding the internship dates. Selected students can contact me to request a date change.