Summer research bursaries in the Department of Computer Science

The Department of Computer Science has three summer research bursaries available for the period between November 2020 and February 2021. These are described below, with further information on application at the end of this document.

Quantitative methods for comparing viral transmission histories

In a recent study we designed an effective method to compare timed evolutionary histories known in epidemiology as transmission trees. Our method can, for example, distinguish an influenza outbreak from an HIV outbreak by only looking at the histories of transmission events. This summer project will contribute to developing powerful and scalable algorithms for computational genomics. Specifically, the student will work with other members of the bioDS lab to design and implement efficient algorithms for comparing timed evolutionary histories. No biological background will be necessary and the project can suit someone interested in at least one of the following areas: algorithms (ideally online algorithms), computational complexity, phylogenetics, statistical modelling, discrete mathematics.
Contact/Supervisor: Dr Alex Gavryushkin (alex@biods.org)

ARephotography: Combining Augmented Reality and Computational Rephotography

In this project, we explore ARephotography, a new concept for combining Augmented Reality (AR) and Computational Rephotography. The traditional concept of Rephotography aligns historic photographs with recent photography. This is often used for comparing the current state of historical sites with views from the past for instance by creating side-by-side visualisations of a now-and-then view. For many use cases a now-and-then view can be helpful for understanding change, e.g., for historical applications, tourism or even environmental change analysis. In contrast to the time-consuming manual alignment methods that were used in traditional Rephotography, Computational Rephotography methods allow for an automatic alignment step. However, Computational Rephotography methods still come with a gap when users want to explore their surroundings to understand historical changes as those methods only align single photographs. In this project, we will look into the options that are available to bridge this gap by combining Augmented Reality (AR) and Computational Rephotography.
Contact/Supervisor: Dr Stefanie Zollmann (stefanie.zollmann@otago.ac.nz)

Gestural Interfaces

In some applications it is not convenient for people to use hardware devices to interact with computers. Gestures are one solution to this problem - by tracking people's hands or even whole bodies we can interpret gestures to control computers. There are a couple of possible applications for this. One is our version of an augmented reality sandbox where we would like to support pointing gestures to activate visualisations. Another would be an interactive display for the departmental foyer, where visitors could use gestures to select items of interest, swipe through information pages, etc. This project would involve a mix of gesture recognition and visualisation to create an interactive experience suitable for casual use.
Contact/Supervisor: Associate Professor Steven Mills (steven.mills@otago.ac.nz)

Interested?

- The summer research bursaries are open only to students who are returning to study at a New Zealand or Australian University in the following year.
- Students must not be receiving alternative scholarship support for the same project or any other project over the same time-frame. Students may hold only one summer research bursary for the period.
- Students who currently hold a University of Otago Doctoral or Master's Scholarship are not eligible for a Summer research bursary.

Tenure

The summer research bursaries take place over the November to February period, and are for 10 weeks each. Time off for holidays during this time can be negotiated.

Value

$5,000 tax-free to be paid in 3 instalments with the final $500 paid after the project report or other outputs have been submitted.

To apply

Please send your CV and academic record, together with a short cover letter explaining your suitability for the project, by email (subject: "Summer research application") to the individual contact listed with each project that you're interested in. You may apply to more than one project, but as noted above, can only hold one bursary.
Closing date for applications: Friday 2 October 2020
Start date if successful: November 2020
(the exact start date to be negotiated depending on your examination commitments etc.)