



THE UNIVERSITY
of ADELAIDE

Summer Research Scholarships

School of Computer Science

Project Titles 2017/18

Human Interactive Optimisation for Digital Art

Supervisor: [Prof Frank Neumann](#)

Evolutionary algorithms for problems with dynamically changing constraints

Supervisor: [Prof Frank Neumann](#)

Using deep learning surrogate functions for the discovery of artistic image variants

Supervisors: [Dr Brad Alexander](#) and Mrs [Aneta Neumann](#)

Using multi-objective evolutionary algorithms to drive diversity in artistic image transitions

Supervisors: [Dr Brad Alexander](#) and Mrs [Aneta Neumann](#)

Large-scale Data Analytics to Understand Student Programming Behaviours

Supervisor: [Dr Claudia Szabo](#)

Spore: Developing a Tool for Understanding Evolution using Bio-Informatics

Supervisor: [Dr Claudia Szabo](#)

Context Summaries in Battle Scenarios

Supervisor: [Dr Claudia Szabo](#)

Fence removal with deep neural network

Supervisors: [Dr Lingqai Liu](#) and [Prof Chunhua Shen](#)

In this project, you will develop an algorithm based on the deep neural network to remove the fence in a picture. The original fence part will be replaced by pixels which are consistent with the nearby pixels and the whole scene. This creates a "see through the fence" effect of the input picture.

Snap and search: a deep learning based image retrieval system

Supervisors: [Dr Lingqai Liu](#) and [Prof Chunhua Shen](#)

In this project, you will build a deep learning based image retrieval system. This method you developed can efficiently create low dimensional binary image signature and based on this signature you can perform efficient image retrieval that is, finding images similar to your query image.

Solve the neighbour Coverage Problem

Supervisor: [Dr Yuval Yarom](#)

Live side-channel attacks reconnaissance

Supervisor: [Dr Yuval Yarom](#)

Side-channel attacks on Curve25519

Supervisor: [Dr Yuval Yarom](#)

Development of a run-time assembler for X86

Supervisor: [Dr Yuval Yarom](#)

Automated assessment of reading comprehension using Natural Language Processing techniques

Supervisors: [Dr Thushari Atapattu](#), [Prof Katrina Falkner](#)

Contact: thushari.atapattu@adelaide.edu.au

Reading comprehension (RC) is the ability to read text, process it, and understand its meaning. One common method to assess and improve reading comprehension of learners' is by answering questions from the reading text. However, the manual construction of questions based on the learners' competency levels and assess the answers is a time-consuming task. Accordingly, computer-based systems are developed to automatically generate questions from a given text and grade them automatically. So far, this approach is succeeded for 'yes/no' or 'multiple choice questions (MCQ)'. This project aims to automatically grade short-answer questions.

This project provides a human-generated machine reading comprehension dataset. The student expects to learn Natural Language Processing (NLP) techniques to build a computational model to grade short answers for simple to average difficulty questions.

Advanced Algorithms to the Traveling Thief Problem Challenge

Supervisor: [Dr Sergey Polyakovskiy](#)

Just-In-Time Aspect in Bin Packing

Supervisor: [Dr Sergey Polyakovskiy](#)

Solving Optimisation Problems in Transport Logistics

Supervisor: [Dr Sergey Polyakovskiy](#)

Artificial Intelligence Techniques in Application to Multi-Component Combinatorial Optimisation Problems

Supervisor: [Dr Sergey Polyakovskiy](#)