NICTA Internship and PRIMA Conference

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The supported project combined several activities of the student that are summarized below. All of these activities represented key professional experiences for the student extending his expertise and adding also a new flavor to his thesis. Also importantly, relevant interesting results were achieved as a part of the joint research being conducted in the framework of the project.

NICTA ORG Internship
Optimization Research Group (ORG) of National ICT Australia is a recognized research group bringing together established researchers like Pascal Van Hentenryck or Toby Walsh. Its standout activities include transportation optimization, computational disaster management and excellent results in research fields adjoining the social choice theory.

As a part of the internship, the student collaborated on the computational disaster management project. In the framework of the disaster impact mitigation, the need arises to restore the operation of various infrastructures, e. g. electricity or gas networks. These infrastructures can be jointly operated by multiple self-interested parties with the operation of some parts of the infrastructure being dependent on previous restoration of some other parts. As such, the restoration thus presents a potentially competitive scenario. While the social welfare in this setup corresponds to a schedule of repairs aiming at minimizing the total outage time, the self-interested parties may aim at specifically restoring the operation in the parts owned by them, postponing the repairs to other parts potentially resulting in a socially sub-optimal overall schedule of the restoration operation.

As a part of the internship, the student (in collaboration with other members of the group) proposed a mathematical model for the studied scenario dubbed **Interdependent Scheduling Games** and researched its optimization and game-theoretic properties, e. g. the relation between equlibria and socially optimal solutions, potential mechanisms motivating the players to act in a socially advantageous ways, etc. The research is ongoing with several articles in the pipeline.

Most importantly, the student was also able to familiarize himself with the working environment in a top--tier research group and extend his expertise to novel areas. Subjectively, this provided for a great experience, motivation for the student's future career and also for interesting new flavors in positioning the student's thesis.

PRIMA Conference and Summer School of Optimization
The Principles and Practice of Multi-agent Systems (PRIMA) conference is a recognized conference in the area of multi--agent systems. The student's participation included a presentation (both oral and poster) at the Doctoral Consortium of the conference as well as a full paper being accepted for the proceedings titled „An Efficient Route Minimization Algorithm for the Vehicle Routing Problem with Time Windows based on Agent Negotiation".
The student also participated at the Summer School of Optimization aimed at mathematical and algorithmical methods of tackling complex, potentially stochastic optimization problems, e. g. Constraint and Mathematical Programming, Stochastic Optimization, etc. The School featured internationally recognized lecturers, e. g. Pascal Van Hentenryck, Martin Savelsbergh, and Toby Walsh, and provided the student with new insights relevant to his thesis.

Optimisation Summer School 2014, Kioloa, NSW, Australia