CRAIK, Andrew James  
BASc Comp Eng (Dst.) UWaterloo

Thesis Title:
A Framework for Reasoning about Inherent Parallelism in Modern Object-Oriented Languages

Supervisors:
Dr. Wayne Kelly (Principal)  
Prof. Paul Roe (Associate)

Citation:
Computers with multi-core processors have become commonplace and programmers are increasingly turning to parallelism to more fully exploit these new processors. This thesis proposes a new framework which can be used to safely parallelize programs by facilitating reasoning about data dependencies in an abstract and composable manner. This framework can be used by automated tools as well as by programmers to exploit existing parallelism and to understand how to restructure programs to increase the amount of available parallelism. The proposed framework draws up on ideas from Ownership Types and has been validated using a combination of formal proofs and application of the ideas to a number of representative sample applications.