Notice of the Final Oral Examination
for the Degree of Master of Applied Science
of
EBAD SALEHI
BSc (Sharif University of Technology, 2012)

“Employing Compression Solutions under OpenACC”

Department of Electrical and Computer Engineering

Friday, January 29, 2016
10:00 A.M.
Engineering Office Wing
Room 430

Supervisory Committee:
Dr. Amirali Baniasadi, Department of Electrical and Computer Engineering, University of Victoria
(Supervisor)
Dr. Kin Li, Department of Electrical and Computer Engineering, UVic (Member)

External Examiner:
Dr. Sudhakar Ganti, Department of Computer Science, UVic

Chair of Oral Examination:
Dr. Don Vandenberg, Department of Physics and Astronomy, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies
Abstract

For GPUs to achieve their peak performance, effective and efficient usage of memory bandwidth is necessary. To this end, programmers invest extensive development effort to optimize a GPU program, specially its memory bandwidth usage. The OpenACC programming model has been introduced to tackle the accelerators programming complexity. However, this model’s coarse-grained control on a program can make the memory bandwidth utilization even worse than CUDA. We propose an extension to OpenACC in order to reduce the traffic on the memory interconnection network, using a compression method on floating point numbers. We examine our method on three case studies and achieve up to 1.36X speedup.