KIM, Dong Hyun (NSERC PIN:308890)

Contributions to research development

a. Articles published or accepted in refereed journals

H. Cheng, B. Gergel, **E. Kim**, and E. Zima. Space-Efficient Evaluation of Hypergeometric Series. ACM SIGSAM Bulletin Communications in Computer Algebra(2005). Accepted to appear in an issue of vol. 39, 2005.

Applicant's statement

1. Research Experience

The paper "Space-Efficient Evaluation of Hypergeometric Series" is based on the work I did in summer 2004 as an NSERC USRA under the supervision of Dr. Howard Cheng at the University of Lethbridge. In this work, we devised a new algorithm for the evaluation of hypergeometric series. Several important mathematical constants can be computed as hypergeometric series, but performing such computations requires a large amount of memory. We applied techniques from computational algebra and number theory to obtain a new algorithm, which requires significantly less memory than existing algorithms while maintaining the same time complexity.

In Summer 2005, I worked with Dr. Stephen Wismath at the University of Lethbridge on a research project in the area of graph drawing. I was mainly involved in designing a new model for drawing planar graphs and directed acyclic graphs in three dimensional integer lattices. This research was motivated by problems in VLSI designs and flow networks.

2. Relevant Activities

- Reviewer for Canadian Conference on Computation Geometry(CCCG) 2005
- Reviewer for Graph Drawing(GD) 2005
- Invited seminar on "How fast can you compute π?" February 2005
  McGill University
- Invited seminar on "Space-Efficient Evaluation of Hypergeometric Series" August 2004
  University of Lethbridge
- Programming Contests: competed in ACM International Collegiate Programming Competition 2003(24th place) and 2004(7th place). iCore Alberta Collegiate Programming Contest 2004(2nd place)