INTERNATIONAL CENTRE OF EXCELLENCE FOR EDUCATION IN MATHEMATICS

MatLab toolbox on the cross-entropy method

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My project for the vacation scholarship was to start work on building a Matlab toolbox on the cross-entropy method, under the supervision of Dr Dirk Kroese. I was also working with Nathan Jackson, Laurel Yu, and Zdravko Botev.

We started out the first week by learning and getting used to the programs we would be using, such as the unix operating system, emacs, latex, matlab and html coding. My job was to build the structure for the toolbox, and make the help files that were to go into the help navigator in Matlab. To do this I studied the existing toolboxes already in Matlab and figured out how they worked so I could make my own.

We decided to follow closely the structure of the Genetic Algorithm (GA) toolbox incorporated in Matlab 7. Once the structure was built, I started work on making the help files, including introduction pages on the CE method, and explanations on how it is applied to rare-event simulation, combinatorial optimization and continuous multi-extremal optimization. I also wrote worked examples of each type that explain how the CE method works in detail for each case. Laurel and Nathan also helped with providing a number of test functions, and the results that the CE method obtained when applied to them.

Included in the toolbox so far are 37 html pages and 175 picture files.

Ben received an ICE-EM Vacation Scholarship in January 2005.
See www.ice-em.org.au/students.html#scholarship.