School of Computer Science
M.S. Thesis Defense

By
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Evaluation of Asian Options: A Spectral Expansion Approach

ABSTRACT

The eigenfunction expansion approach of Linetsky *et al*. to the problem of pricing options represents an application of the series solution of differential equations, familiar to scientists and engineers, to problems of financial mathematics. In the cases of the double-barrier call and Asian (average-price) put options, the eigenfunction expansion approach generates closed-form solutions for the option price. For the double-barrier call option, the solutions are in terms of natural logarithms and trigonometric functions. For the Asian put option, the resulting solution is expressed in terms of Whittaker functions. The price of the Asian call is determined from the price of the Asian put by invoking call-put parity.

By reproducing Linetsky's results, this work confirms that Linetsky's published writings on this method, as applied to the two types of options studied here, are accurate and complete. Additional computations on the Asian option indicate that it provides results consistent with those of the numerical partial differential equation approach favored by some workers in the field for a range of plausible values of the input parameters.

Date: Tuesday, November 30, 2010

Time: 4:15 p.m.

Place: Devon Energy Hall (DEH) Forum room 320

Committee members: **Dr. S. Lakshmivarahan – Chair**
Dr. Sridhar Radhakrishnan
Dr. Duane R. Stock

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