DEPARTMENT OF MATHEMATICS & STATISTICS

UNIVERSITY OF WYOMING

Thursday
September 19, 2019
4:10 - 5:00 pm AG 1032

Reception before the talk:
RH 261 at 3:30 pm

Hiroshi Fujiwara

Professor, Graduate School of Infomatics
Kyoto University

Multiple-Precision Arithmetic and Its Implementation for Matlab

Abstract:

In this talk, we discuss rounding errors in numerical computations, and introduce multiple-precision arithmetic environment on MATLAB. On the digital computers, real numbers are approximated with finite precision. Thus the rounding errors are inevitable, and in particular, their rapid growth due to numerical instability are serious from the viewpoint of the reliability. Mltiple-precision arithmetic has a possibility to overcome the difficulty, since it enables numerical computation without rounding errors virtually by the use of enough precision. In the presentation, we discuss the influence of rounding errors in simple examples. Some effective use of multiple-precision arithmetic is demonstrated in advanced sciences. Finally, we introduce its design and implementation on MATLAB, and show performance comparisons with other environments.