Séminaire en optimisation
GERAD | CRC-ONDI

John E. Dennis, Jr.
Rice University, États-Unis

Le jeudi **18 septembre** 2014 à **14h45**

Salle **4488**, Pavillon André-Aisenstadt
Campus de l'Université de Montréal
2920, chemin de la Tour

Organisé par :
Miguel F. Anjos, GERAD & Polytechnique Montréal

Why to study derivative-free algorithms

Over the course of my career, continuous nonlinear optimization has come into its own as a crucial area of computational and applied mathematics. When I got my degree in 1966, it was generally true that the available algorithms could not solve the problems encountered by an industrial design engineer. I do not think this is true any longer. A large part of this advancement has been the resurgence of interest in derivative-free algorithms.

I will introduce you to, or remind you of, the class of problems we can now solve using derivative-free methods. These problems are small, very expensive, and they have some universal properties not usually mentioned in polite conversation in the halls of academe. I will not talk about our approaches to these problems, but I will give some practical successes of our algorithms as evidence of the importance of this class of problems, and I will outline two extensions needed now for this class of problems by industrial designers. Specifically, I will mention nonlinear robust optimization and optimization with conflicting objectives. Although I have worked on the really hard and important areas of multidisciplinary design optimization and distributed optimization, these are beyond the scope of a single talk.

GERAD
GROUPE D'ÉTUDES ET DE RECHERCHE
EN ANALYSE DES DÉCISIONS

Chaire de recherche du Canada
sur l'optimisation non linéaire
discrète en ingénierie

**POLYTECHNIQUE
MONTRÉAL**

Brief Vita for John Dennis

John Dennis is Noah Harding Professor Emeritus of Computational & Applied Mathematics at Rice University. He served two terms as Chair of the Department of Computational and Applied Mathematics, and he also served a term as Chair of the Department of Computer Science.

His research is on rigorous optimization algorithms that work for real problems, and to advance that work, he spent AY 1975-76 working at the National Bureau of Economics Research and 1996-97 working with a team at Boeing on software tools to support simulation-based design. He has been collaborating with Boeing since 1993, and he is an original member of the Boeing team that produced the commercial Design Explorer toolkit for simulation-based design.

His editorial service includes 7 years on the board of SIAM Journal on Numerical Analysis, and 15 years on the board of MATHEMATICAL PROGRAMMING with a term as Coeditor. He was founding Editor-in-Chief of SIAM JOURNAL FOR OPTIMIZATION and founding Editor-in-Chief of the joint MPS/SIAM book series on optimization.

He served as Chair of the Mathematical Programming Society and Chair of the Society for Industrial and Applied Mathematics Activity Group for Optimization, as a member of the SIAM Council, and a member of the Program Committees for the Mathematical Programming Society and the International Consortium of Industrial and Applied Mathematics Societies.

He was for 10 years Professor of Computer Science at Cornell and as a member of the graduate faculties in Operations Research, in Applied Mathematics, and in Computer Science. He has been a Very Important Visitor and Ordway Distinguished Lecturer at the University of Minnesota, a Fullbright Lecturer to Argentina, thrice an Erskine Fellow at the University of Canterbury, New Zealand, and an Adjunct Professor of Combinatorics and Optimization at the University of Waterloo, Canada, of Computer Science at the University of Houston, and he is an Affiliated Professor of Applied Mathematics at the University of Washington.

He coauthored with Robert Schnabel the book, NUMERICAL METHODS FOR UNCONSTRAINED OPTIMIZATION AND NONLINEAR EQUATIONS, which was published in 1983 by Prentice-Hall, translated into Russian by Mir Press, and is now in its fifth printing as a SIAM Classic in Applied Mathematics. Of his 35 PhD graduates, 17 are in industry or government. On his 60th birthday, he was honored by the publication of a special issue of the SIAM JOURNAL FOR OPTIMIZATION dedicated to him. He is listed in ISI Highly Cited Computer Scientists. He is an elected SIAM Fellow.