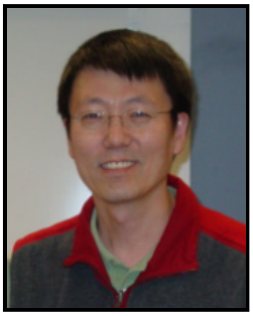

Computational Mathematics Seminar Series

Bioinformatics and Biocomputing

Zhijun Wu, Iowa State University

Professor, Department of Mathematics

Johnston Hall 338
November 03, 2008 - 11:00 am

Abstract:
Biological systems are complex information systems, with their information, in complex genetic forms, passed from generation to generation, shared in families of species, and most importantly, coded to produce the ingredients necessary to make the diverse forms of life and to conduct complicated biological processes. Since the discovery of the double helical structure of DNA and hence the secrete of genetic inheritance of life in 1953, biology has entered a new era of research on how biological systems have ever evolved at molecular genetic levels and how genetic information has been coded, stored, and processed at various stages of life. Later, with the completion of the human genome project in 2000, the field of bioinformatics and computational biology has emerged and rapidly developed, as a result of the urgent need for the access to the enormous amount of data generated from all the genomic research projects and also as a result of the recognition of modern biological science as an information science, where informatics and computation have played crucial roles. Indeed, bioinformatics and computational biology have become important and sometimes, even indispensable tools and made great impacts in many fundamental research areas of biology, ranging from genomic sequencing to protein modeling, from gene annotation to protein functional prediction, from structural genomics studies to microarray data analysis, from gene regulatory network analysis to metabolic pathway identification, from drug design to cancer modeling, etc. In this talk, I will give a brief introduction to the field of bioinformatics and computational biology, with a focus on sequence analysis, structural computing, and systems modeling and in particular, on their biological motivations, the related computational problems, the general approaches to the problems, and the mathematical and computational challenges.

Speaker's Bio:
Dr. Zhijun Wu received a Bachelor degree in Computer Science in 1982 from Huazhong University of Science and Technology and a Master degree in Computational Linguistics in 1985 from Wuhan University in China and a PhD degree in Computational Mathematics in 1991 from Rice University in United States. He did postdoctoral research at Cornell University from 1991 to 1994 and worked as a research scientist at Argonne National Lab from 1994 to 1998 before joining the faculty of Iowa State University in 2000. He is currently a professor in the Department of Mathematics and Program on Bioinformatics and Computational Biology at Iowa State. His research interests include numerical linear algebra, optimization, numerical solutions to ordinary and partial differential equations, bioinformatics and computational biology, and parallel high-performance computing. He is the author of Lecture Notes on Computational Structural Biology.

Refreshments will be served.
This lecture has a reception.

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