Western Science

Department of Applied Mathematics

APPLIED MATHEMATICS COLLOQUIUM

Date: Wednesday, October 12, 2016
Time: 2:30 – 3:30 p.m.
Location: Middlesex College Room 204

Toward real-time cardiac simulation

Professor Raymond Spiteri
Department of Computer Science
University of Saskatchewan

Abstract: Heart disease is the leading cause of death worldwide. Mathematical modelling and computer simulation can help with diagnosing heart disease, discovering new and personalized medicines, and planning surgical procedures. But in order for this to happen, the simulations must provide clinically relevant data on a clinically relevant time scale.

In 2012, a team from IBM and Lawrence Livermore National Laboratory was able to simulate one second of heart activity in about seven seconds using their highly scalable Cardioid software running on the fastest computer in the world at the time. This is a formidable accomplishment, but we still a ways to go from your cardiologist being able to do perform realistic simulations on their iPad while sitting with you in their office.

In this presentation, I relate a few of the tales from numerical analysis, scientific computing, and high-performance computing that we hope will push us over the top and achieve real-time cardiac simulation.