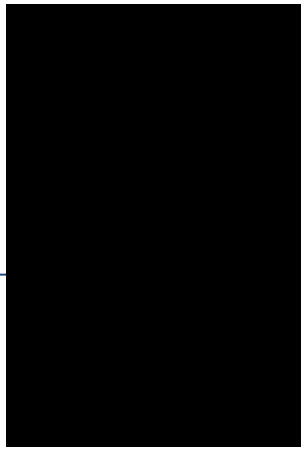
CoE-MaSS weekly seminar series

THE DST-NRF CENTRE OF EXCELLENCE IN MATHEMATICAL AND STATISTICAL SCIENCES (CoE-MaSS) WOULD LIKE TO PRESENT A RESEARCH SEMINAR BY

Ms Terry Oliphant

(School of Computer Science and Applied Maths, Wits)

"Trajectory-based methods for nonlinear and mixed integer nonlinear programming problems"



Friday, 2 October 2015
10h30-11h30

Broadcast live from:
Videoconferencing Facility, 1st Floor
Mathematical Sciences Building, Wits West Campus

How to connect to this seminar remotely:
You can connect remotely via Vidyo to this research seminar by clicking on this link:
http://wits-vc.tenet.ac.za/flex.html?roomdirect.html&key=y0SSOwFsvsidbzg4qFdWXvvQtyI
and downloading the Vidyo software before the seminar.
You must please join in the virtual venue (called "CAM Seminar Room" on Vidyo) strictly between **10h00-10h15**. No latecomers will be added.

Important videoconferencing netiquette:
Once the seminar commences, please mute your own microphone so that there is no feedback from your side into the virtual room. During the Q&A slot you can then unmute your microphone if you have a question to ask the speaker.

Title:
Trajectory-based methods for nonlinear and mixed integer nonlinear programming problems

Presenter:
Ms Terry Oliphant, School of Computer Science and Applied Mathematics, Wits; Email: terry.oliphant@wits.ac.za

Abstract:
Trajectory-based methods for solving constrained nonlinear programming problems (CNLPs) and mixed integer nonlinear programming problems (MINLPs) are proposed. The trajectory-based method for unconstrained nonlinear programming problems (UNLPs) was proposed by Snyman \cite{s81}. The algorithms developed for CNLPs and MINLPs, which are extensions of Snyman's method \cite{s81}, are however novel.
First we develop a trajectory-based local algorithm for solving general CNLPs and then an adaptation of this algorithm for MINLPs is designed around the definition of a local minimum for MINLPs proposed by Newby \cite{new13}. In the development of the algorithms, the augmented Lagrangian function is used to convert the constrained problem into an equivalent unconstrained problem. Several novel contributions are made, including a new scheme for updating the penalty parameter, the implementation of an adaptive step size routine and a scaling mechanism for badly scaled problems. Global and local convergence properties of the trajectory-based method for CNLPs are established.