The University Of Sheffield.

Automatic Control and Systems Engineering

The Department of Automatic Control & Systems Engineering is pleased to announce the following seminar:

Agent-based Modelling of Hepatic Inflammation

Mr Daniel Moyo
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The University of Sheffield

Wednesday, 30th October 2013 at 14:00
LT02, Sir Henry Stephenson Building

Abstract
As a newcomer to the department, I will introduce myself by presenting some of the work done during my PhD at the University of York (currently writing-up).

Granulomas are inflammatory aggregations of immune system cells that form in response to infection in a number of disease settings, such as Mycobacterium Tuberculosis, Sarcoidosis and Visceral Leishmaniasis (VL). In the context of VL, a deadly parasitic disease, parasites traffic to the liver, where they are ingested by liver-resident macrophages called Kupffer cells. Kupffer cells play a central role in the initiation of an inflammatory response in the liver, though the specific mechanisms that influence that initiation, and downstream cellular recruitment and retention, remain poorly defined. Current experimental techniques used for studying granulomatous inflammation have associated difficulties and unique limitations. It is argued that computational approaches can prove useful for the study of inflammation and the formation of VL induced granulomas. I will explain why we chose to develop an agent-based model of early granuloma initiation, describing how the model was designed and engineered. I will then demonstrate how we utilized the model to explore several hypotheses relating to the system, the results of which will be shared, along with work towards experimental validation of our predictions.

Biography
Daniel Moyo recently joined ACSE as a research associate working on Dr. Purshouse's ESRC grant, to investigate whether micro-simulation modelling approaches can be used to predict episodic alcohol drinking behaviours in the British population. Prior to joining Sheffield, he undertook his PhD in Computer Science at the University of York under the supervision of Professors Jon Timmis and Paul Kaye. His research, based in York's Centre for Immunology and Infection, involved using agent-based modelling to help understand the early mechanisms associated with parasite induced liver inflammation.

Daniel's research interests revolve around agent-based modelling of complex systems, investigating best practice for the design, development and interpretation of complex systems simulations.