

Joint CSE and ModAbs Event: Biology + Computing = ??, 21st May 2012

The sun shone on Stirling as we met to discuss the meaning of the equation: Biology + Computing = ?? This was a SICSA-sponsored workshop, bringing together members of the Modelling and Abstraction (modabs) community with the self-organising, emergent, autonomous, biologically inspired systems (seabis) community. With the continuing interest in modelling biological systems, these two groups have potentially much in common. The aim of the workshop was to allow us to share our experiences and inspirations, and to foster connections between participants.

Vashti Galpin opened the proceedings with an excellent invited talk on modelling protein trafficking using process algebra (specifically, Bio-PEPA and HYPE). The Seabis side of the group was represented by Yaochu Jin, who spoke about analysing and synthesising gene regulatory motifs, with particular emphasis on the robustness and evolvability of solutions. Contributed talks were widely varied: some biologically-focussed talks (Systems biology approach to in silico and in vitro modelling of drug sensitivity-resistance transition in PI3K/PTEN/AKT signalling in cancer, Epidemiology in the heart of informatics, Relationship between AMH and follicle number throughout life), some biologically-inspired computation (An Investigation of Cellular Intelligence and its Role in Artificial Intelligence), talks addressing the problems of incomplete data in modelling (An introduction to Automatic Static Analysis of Biological Models, Qualitative and Semi-quantitative Approaches to Systems Biology), some crossover work (Optimisation of Process Algebra Models Using Evolutionary Computing), and some focussed on networks and their properties (Biologically inspired Coupled Complex Networks, A critical study of network models for neural networks). Particularly thought-provoking was Leslie Smith's contribution on Synthetic neural systems, raising questions about brain:computer interfaces.

An important feature of the day was the final discussion session. Participants were asked to write questions on post-its during the day (so we could also see what sort of discussion was developing). A recurring theme was abstraction: what level of abstraction to choose, and how to know the level is correct. Linked was the issue of lack of data. We also asked what computing could bring to biology: are there "design patterns" for biology? On a more practical note, questions were asked about funders and publishers for inter-disciplinary work. Our lively discussion had more questions than answers!

The meeting was held on Monday 21st May 2012 at the University of Stirling, organised by Carron Shankland, David Cairns and John McCall.