

Week Starting 29th August

This week I read a few new papers, including “The Danger Theory and Its Application to Artificial Immune Systems” by Uwe Aickelin and Steve Cayzer. This paper was written before the dendritic cell model paper by the same authors, and talks about possible advantages of constructing a computational model based on Polly Matzinger’s Danger Theory. This notion of ‘danger’ seems more powerful than the self non-self concept, and the paper argues that even if the theory is not a valid biological model, we can still use it in our computers. It mentions that the idea of normal is more adaptive in the danger theory than ‘self’, and can change over time, such as packets in changing network usage.

In preparation for meeting Peter Bentley, I re-read many papers, and finished reading his book, trying hard to think of questions to ask him. Though many of his algorithms could be parallelised, the only published papers that I could imagine benefiting from hardware implementation were in the area of intrusion detection, as it is the only application with real-time processing needs, and intense computation. Robots used in his papers weren’t limited by computational power, but by the time taken for actual experiments. One paper on ‘Evolvable Hardware’ by Timothy Gordon and Peter Bentley was quite an interesting area of research, but does not require hardware development, only a single FPGA (or a simulator) and an evolutionary program capable of programming data to the device, and evaluating fitness. At the moment, these techniques have only been used to develop circuits like 5 bit adders. During the meeting, Peter mentioned some of the uses for hardware that he had in mind, the most interesting of which might have been for pathology.

I’ve also been continuing to play with the utilities Gabriel provided me with, and the structure of the anomaly filter, and will implement this next week. I should have time to fine-tune the algorithm, and try alternatives, though I will need to use a signature generator based on some machine learning dataset until the filter’s input has been written by Gabriel. At the end of the next week, I plan to start working through the Handel C tutorials.

Thanks for your time,
Steven