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## Abstract

This thesis examines the role of wireless sensor networks, as illustrated by specknets, as an appropriate platform for developing novel immune-inspired algorithms. Properties of the immune system and wireless sensor networks are examined in parallel, revealing a potential mapping between the two. The cognitive view of the immune system is identified as appropriate for further investigation at the theoretical level, while the functionality of dendritic cells becomes the focus in terms of biology. An agent-based model is developed as an exercise in understanding the dendritic cell function, emphasising the aspect of mobility. The model is then developed into a simulated implementation for specknets, using the application problem of temperature monitoring and control. The thesis concludes with an analysis about certain aspects the immune system and the specknet, and the proposal of a methodology to allow blending of ideas derived from two such complex systems.