Abstract

During the past decade, there were many approaches that made use of the concepts of artificial immune system. By reviewing the literature, it was found that the research on the artificial immune memory design was sparse and only a few researchers attempted to embark upon issues related to it. This proposed research introduces a novel model that serves as an artificial memory for the artificial immune system. The proposed research design approaches this goal by modeling the primary immune memory response using an idiotopic artificial immune network. As well, the secondary immune memory response is modeled by using a hetero-associative memory network. The two models were tested and the results showed considerable resemblance with the primary and secondary immune memory system behavior. The testing results showed that the developed memory models achieved 100% recognition rates for the tested patterns. Even after adding noise to the input data, the overall memory model showed acceptable recognition rate of 87.5% for 25% noise, and 68.7% recognition rate for 50% noise. Therefore, the designed primary and secondary artificial immune memory model achieve significant potential in representing the behavior of the original immune system memory.
References

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**Index Terms**

- Computer Science
- Artificial Intelligence

**Keywords**

- Artificial Immune Systems
- Artificial Immune Memory
- Idiotopic Artificial Immune Network
- Hetero-Associative Networks