A NOVEL COMBINATION OF NEGATIVE AND POSITIVE SELECTION IN ARTIFICIAL IMMUNE SYSTEMS

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TÓM TẮT:

Artificial Immune Systems (AIS) is a multidisciplinary research area that combines the principles of immunology and computation. Negative Selection Algorithms (NSA) is one of the most popular models of AIS mainly designed for one-class learning problems such as anomaly detection. Positive Selection Algorithms (PSA) is the twin brother of NSA with similar performance for AIS.

Both NSAs and PSAs comprise of two phases: generating a set D of detectors from a given set S of selves (detector generation phase); and then detecting if a given cell (new data instance) is self or non-self using the generated detector set (detection phase). In this paper, we propose a novel approach to combining NSAs and PSAs that employ binary representation and r-chunk matching rule. The new algorithm achieves smaller detector storage complexity and potentially better detection time in comparison with single NSAs or PSAs.