

# Evolutionary Optimization Algorithm using MHC and Immune Network

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The objective of this paper is to propose an evolutionary optimization algorithm using MHC and Immune Network and to verify its validity by means of computer simulations. Our algorithm solves the division-of-labor issues and problems for each agent's work domain in multi-agent system (MAS) by two immune functions. First, the Major Histocompatibility Complex (MHC) distinguishes a "self" from the other "nonself", used in the process of eliminating states of competition. Second, the Immune Network that produces specific antibodies by modification of immune cells is used to produce adaptive behaviors for agents. Then, to investigate the validity of the proposed method, this algorithm is applied to " $N$ -th agent's Travelling Salesmen Problem (called  $n$ -TSP)" as a typical case problem of multi-agent system. The effectiveness of solving MAS will be clarified through some sets of simulations.