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PRACA DOKTORSKA

*Zastosowanie sztucznych systemów immunologicznych w
wybranych zadaniach diagnostycznych*

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ABSTRACT

Nowadays very fast spread new section of artificial intelligence – artificial immune system which are a metaphor of innate immune system. For than in these work are try to analyse and application of selected artificial immune system mechanisms for example for optimisation, classifications and anomaly detection.

The main discussion starts in the second chapter with description of human immune system. Focusing on selected mechanism of immune system which mainly reflect in artificial immune system. In this chapter are also describe selected application of artificial immune system, which shows wide range of mechanism on which are based.

The fourth chapter of this work presents four algorithms, which are used in these work. In case of anomaly detection in time chain algorithm mainly base on negative selection. However classification system base on immune network.

Next chapter shows application of artificial immune system for optimisation. Firstly algorithm checked for optimisation multimode function. Then consider fuzzy logic parameters optimisation. Fuzzy logic systems were used to classification of drilling tool stage and nominate empirical model of grinding thermal deformation.

Sixth chapter shows application of Rlais algorithm for classification task. For classification are used different shape of classes border. Than were build classification system which classify to three known and one unknown classes. In the next step applied approach to classification of drilling tool stage. Next are analyse aiNet algorithm. Test are similar like for Rlais algorithm. Were analyse following parameters: suppression threshold and pruning threshold.

In the next chapter are shown the results of negative selection algorithm to identification anomaly in time chain. In the firs part are shown anomaly detection in selected mathematical function. Were analyse influence following parameters for proficiency of anomaly detection: number of identically bits, numbers of section and window wide. Than are shown practical application of negative selection algorithm for motor temperature and vibration signals.

The last chapter summarize the conducted research and points at direction for future research.