

A STUDY OF CHEMICAL WARFARE AGENTS RECOGNITION USING ARTIFICIAL NEURAL NETWORK

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ABSTRACT

With the increasing possibility for terrorists to obtain (NBC) weapon, the world is now on the shadow of NBC attack. This situation is even more obvious after the 911 attack in USA. To detect the hazard chemical materials, professional operators need to bring many types of heavy equipment to contaminated location and conduct a series of tests. However, the first persons arrived the contaminated location usually are not the persons with well-trained skill. Conversely, they could be emergency-service personals or policemen. It is not practical to expect them to accurately operate professional equipments, quickly identify possible hazard elements, and correctly make rescue reaction.

To speed up the insufficiency of current detection model, this thesis develops an information system to assist response personnel who can quickly identifying chemical warfare agents and make appropriate feedback. Based on observation of symptoms caused by the impact of chemical warfare agent's physical and chemical character, a person can easily operate our system. After the input data is coded, artificial neural network (ANN) is used to identify the type of hazard elements through its high calculating ability, memory ability, learning ability, and fault tolerance ability. In this study, we design different models and find the best one. After optimization, we combine

the ANN model with chemical warfare agent data, so that it can be easily utilized anywhere. The result of our experiment informs us that nearly 97% accuracy rate of the system is made for identifying chemical warfare agents. Meanwhile, the system also shows the advantage of stability even some noisy input is made. It is believed that our system can be very helpful for hazard element rescue purpose.

Keyword:Artificial neural network, chemical warfare agent,