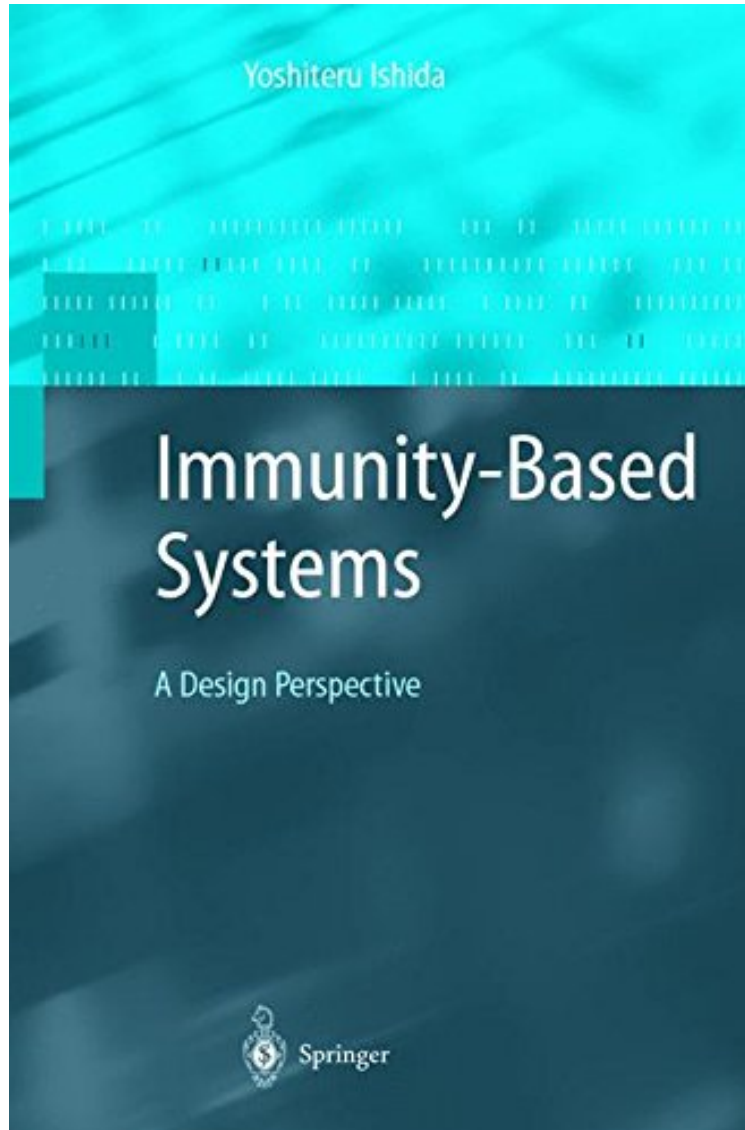



## Immunity-Based Systems

Yoshiteru Ishida

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#6536106 in Books 2004-05-27Original language:EnglishPDF # 1 9.21 x .50 x 6.14l, 1.00 #File Name: 3540008969192 pages | File size: 16.Mb

**Yoshiteru Ishida : Immunity-Based Systems** before purchasing it in order to gage whether or not it would be worth my time, and all praised Immunity-Based Systems:

2 of 2 people found the following review helpful. Review from my BeBoBio groups pageBy Randy HallMy review taken from the BeBoBio groups page:[...]In this book the author looks at ways the the immune system can act as a paradigm in the design of information processing systems. From what I can gather, the book is primarily oriented towards designing computer control systems and information management systems that can react to failures of individual hardware components or attack by malicious code. From my point of view, this is the almost opposite view

of what I'm interested in, namely, using an information processing system to predictively model an organism (or a component thereof). Therein lies the beauty of it! It seems that computer science and the biological sciences have so far developed independently, and yet curiously moved closer to each other. Biology becomes a data driven science, and computers become complex systems with emergent behavior. All that is needed is the final few pieces to fall in place to link the two in a seamless unity, one which we can use to discover the deep laws of biology. In Immunity-based Systems the approach is from the computer science side. The book relies on the concept of the idiotypic network, which from what I can gather is a somewhat outdated and discarded model of immune system regulation. It does interest me though, and I wouldn't be surprised if there isn't some grain of truth to it. Here's one interesting tidbit from early in the book: "Physical systems have a concept, such as heat, that can be defined on an upper hierarchical level as a macro measure obtained by averaging over states at a lower level. It is difficult to find such a macro concept or measure in biological systems. One reason why a macro concept is lacking in biology is the difficulty of understanding biological systems in terms of hierarchy alone, since biological systems have a recursive structure (as the "self-reference" found in self-reproduction in biological systems). Therefore, information flow is neither unidirectional nor fixed in direction like most of the hierarchies found in physical systems. A hierarchical view does not suffice for biological systems, a recursive view is needed." Page 9 I'm not going to lie, this book is expensive and although short (

After I came to know Jerne's network theory on the immune system, I became fascinated with the immune system as an information system. The main prototypes for biological information systems have been the neural systems and the brain. However, the immune system is not only an interesting information system but it may provide a design paradigm for artificial information systems. With such a consideration, I initiated a project titled "autonomous decentralized recognition mechanism of the immune network and its application to distributed information processing" in 1990 under a Grant-in-Aid for Scientific Research on a Priority Area ("Autonomous Distributed Systems") supported by the Ministry of Education, Science, and Culture. During the project, I promoted the idea that the immune system could be a prototype of autonomous distributed systems. After the project, we organized an international workshop on immunity based systems in 1996 in conjunction with the International Conference on Multi-Agent Systems held in Kyoto, Japan. Recently, there have been several international conferences related to topics inspired by the immune system and an increasing number of research papers related to the topic. In writing this book, a decade after the project, I still believe that the immune system can be a prototype, a compact but sophisticated system that nature has shown us for building artificial information systems in this network age of the twenty-first century.