

Fuzzy Dynamic Systems and Computational Verbs Represented by Fuzzy Mathematics,

by **Tao Yang** (University of California at Berkeley)



ISBN 0-9721212-2-6, size 8.5inx11in, 148pp, Sept.2003, List Price: \$57.99.

The first book on Fuzzy Dynamic Systems

The first book addressing applications of fuzzy dynamic systems to computer sciences

As the first book on fuzzy dynamic systems(FDS), this timely monograph provides a systematic structure of FDS from both theories and applications, and applies FDS to recently developed computational verb theory. This monograph can be used as a textbook or complementary materials to graduate students and researchers from **information sciences, artificial intelligent, fuzzy mathematics, fuzzy logic, nonlinear dynamic system and linguistics.**

Historically, fuzzy dynamic systems (FDS) were studied under different names such as dynamic fuzzy systems, fuzzy differential equations, fuzzy difference equations, fuzzy contractive maps, fuzzy systems, iterated fuzzy systems, fuzzy mappings and fuzzy logic controller. Fuzzy dynamic systems can be generated from conventional dynamic systems by using two methods. In the first method, the fuzzy extension principle can be used to transform a conventional equation into a fuzzy model. FDS generated by this method is called type-I FDS. A type-I FDS is defined by a state space of fuzzy terms and conventional evolving laws. The second method of generating FDS is to use fuzzy compositions. In this method, the corresponding FDS is called type-II FDS. In a type-II FDS, both the state space and the evolving laws are described in the form of fuzzy terms. The evolving laws can be represented as fuzzy relations.

So far, almost all works on fuzzy dynamic systems(FDS) were focused on either mathematical theoretical aspects or conceptual engineering protocol, there were no work yet to address the applications of fuzzy dynamic systems to information sciences, natural language processing and artificial intelligence(AI). On the other hand, the study of computational verbs shows that to model a computational verb, we need to use dynamic systems. This opens the possibility of using FDS to model computational verbs and find applications to computational verb theory and furthermore to information sciences.



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The discipline of intelligent systems has evolved towards its critical goal of embedding non-computable human sensations, perceptions and creativity into machines in 21st century. This critical goal can only be achieved with the help of a new engineering paradigm called **machinself (from machine itself)**. Before building a machinself we need to build cognition systems into machines; namely, to invent a computational cognition. This is a multidisciplinary challenge to experts from **Information Sciences, Computer Sciences, Mathematics, Linguistics, Biology, Psychology and Electrical Engineering.**

Today's Information sciences are not enough to cover the critical spectrum of human intelligence. This Journal arms to provide a forum for exchanging theoretical and practical results on all aspects of 'a computer with a body'. Based on new possible structures of future intelligent machines (such as quantum-effect machines and molecular-self-reproduce machines), it extends today's information sciences to a new stage. At this stage, not only the manipulation of information but also the creation of 'meaningful' information is under study. This means that this Journal extends the researches and studies of information sciences into a computational paradigm of implementing human natural languages, human intuitions, human perceptions, human creativity and human emotions by using technology in the next 50 years. The primary objective of The **International Journal of Computational Cognition (ISSN 1542-5908(online); ISSN 1542-8060(print))** is to provide a forum for an interdisciplinary audience, a forum accessible and affordable to scientists, educators, students and engineers. It encourages readers to contribute their thoughts and experiences. With its peer-reviewed format and its traditional paper and e-paper forms, it services the scientific and engineering community as an easy and simple platform for developing the understandings and applications of advanced studies of *creative* and *intelligent* systems.

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Computational Verb Theory: From Engineering, Dynamic Systems to Physical Linguistics,

by **Tao Yang** (University of California at Berkeley)

ISBN 0-9721212-1-8, size 6inx9in, XIII/204pp, Oct.2002, List Price: \$77.99.

WRITTEN BY THE FOUNDING FATHER OF COMPUTATIONAL VERB THEORY
FROM THE UNIVERSITY OF CALIFORNIA AT BERKELEY
THE REVOLUTIONARY THEORY IN INFORMATION SCIENCES BEYOND FUZZY LOGIC
AND THE FIRST BOOK ON MEASURABLE LINGUISTICS !

Computational verb theory (CV) was invented by Tao Yang in 1997 in the *Department of Electrical Engineering and Computer Sciences, University of California at Berkeley*. Since then, CV has been growing up into a multidisciplinary scientific field attracting attentions of researchers from information sciences, nonlinear sciences, linguistics, biology, psychology, physics and computer sciences. Pushed far beyond fuzzy theory, CV is the first step towards building a complete artificial language into machines. Written by the founding father of CV, this is a lucid, solid and timely monograph for professionals, scientists, academic researchers and students in *information sciences, computer sciences, linguistics, fuzzy logic, signal and image processing* and *control engineering*.

The ultimate goal of CV is to build dynamic irrational intelligence into machines. CV also bridges the gap between physics and linguistics to give birth to a *measurable linguistics*; namely, physical linguistics. In physical linguistics, many classical linguistic problems such as verb classification and telicity in verbs were studied from an entirely new standpoint. Surprisingly, the *bifurcation theory* of nonlinear dynamic systems leads to solid and precise solutions to many linguistic problems such as verb categorizing tests and verb ambiguity. CV also provides a platform of solving *engineering problems* based on dynamic experiences in the form of verb if-then rules. Such engineering applications include verb controllers, verb prediction and verb image processing. As a revolutionary paradigm in information sciences, the computational verb theory is "the next big thing" in building computational perception and computational cognitions into the emerging computers equipped with different kinds of sensors such as video camera, microphone and e-nose. Computational verb theory is also the foundation of the new generation of engineering in the 21st century; namely, the century of *perception-based engineering*.

Handbooks of CNN Image Processing: All You Need to Know about Cellular Neural Networks,

by **Tao Yang** (University of California at Berkeley)

ISBN 0-9721212-0-X, size 6inx9in, XVI/300pp, Sept.2002, List Price: \$97.99.



Invented in University of California at Berkeley by Chua and Yang

Written by one of the leading experts from the same University

The first handbook of the most active research field in Vision VLSI IC Chip since 1988

Cellular neural networks (CNN) were *invented by Chua and Yang in 1988 in the Department of Electrical Engineering and Computer Sciences, University of California at Berkeley*. Since then, CNN have become an extremely active field of researches of *massive parallel computation, image processing, nanoelectronics, cellular automata, visual VLSI chips and vision processors*. It is the only VLSI circuit that IEEE Circuit & System Society needs to establish a separated division to house its massive volume of research activities.

CNN are low cost, low power, extremely high speed supercomputer-on-a-chip. It is at least 1000 times faster than equivalent DSP solutions of many complex image processing tasks. It is a stored program supercomputer where a complex sequence of image processing algorithms is programmed and downloaded into the chip, just like any digital computer. Because the entire computer is integrated into a chip, no signal leaves the chip until the image processing task is completed.

Written by one of the leading figures in this field, this is a lucid and comprehensive reference book for professionals, academic researchers and students. It covers almost all aspects of CNN including: local rule principles, structure and parameter design, continuous-time CNN, discrete-time CNN and multistage CNN. Also, a systematic classification system of different CNN image operations is presented based on major local rule classes.

Hundreds of CNN image operations together with their design processes were presented. The difference and equivalence between continuous-time and discrete-time CNN were formally formulated. The *Generalization Principle* and newly found *Selected and Inverse Selected Principle* make it painlessly to derive tens of CNN operators from a known one. 124 black-and-white figures were used to illustrate the functions of CNN image operators. Many CNN and DTCNN image operations were first time reported to the public, for example, negative CNN classes, selected CNN classes, inverse selected CNN classes, logic-morphologic CNN classes and many more. An extremely detailed index could be used as a fast and efficient lookup table of hundreds of CNN operators.



Quality of Life Research

Edited by **Walenty Ostasiewicz** (Professor and Head of the Department of Statistics and Economic Cybernetics, Wroclaw University of Economics, Poland)

ISBN 0-9721212-9-3, size 8.5inx11in, 154pp, Oct.2003, List Price: \$47.99

This book originated in a Second International Conference on "Quality of Life Research" which took place in September 18-20, 2002 at Wroclaw University of Economics. This book includes selected and newly elaborated papers presented at this Conference as well as some other works prepared by the leading Polish experts who do not participate at the Conference.

After two introductory chapters, there are three chapters dealing with general problems of welfare and well-being, both from global, and from individual point of view. The next three chapters are devoted to comparative studies of quality of life in European countries. The last three chapters deal with particular aspects of quality of life in Poland.

Table of Contents. Ch.1 Outline of quality of life measurement. Ch.2 Evaluation of the quality of life: a taxonomy. Ch.3 Measuring the human condition. Ch.4 On the estimation and calibration of the social welfare function. Ch.5 quality of life from a patient group perspective. Ch.6 Quality of life in Europe: differences between west and east. Ch.7 The application of family-oriented instruments in selected personal income tax systems. Ch.8 A contribution to the estimation of equivalence scales in Poland. Ch.9 Determinants of precautionary behaviors of Polish households in hierarchical approach. Ch.10 Some facts about inequality in Poland: 1993 -1999 evidence.

Contributors. **Giacomo Boesso**, Ph.D. Student at the Department of Economics, University of Padua. **Monika Bullinger**, Professor at the Department of Medical Psychology, University of Hamburg. **Francesco Carlucci**, Professor at the Department of Public Economics, University of Rome "La Sapienza". **Jan Kordos**, Professor at the Institute of Statistics and Demography, Warsaw School of Economics. **Marek Koeny**, Ph.D. Student at the Department of Statistics and Economic Cybernetics, Wroclaw University of Economics. **Stanislaw Maciej Kot**, Professor at the Department of Statistics, Cracow University of Economics. **Walenty Ostasiewicz**, Professor and Head of the Department of Statistics and Economic Cybernetics, Wroclaw University of Economics. **Roberta Piergiovanni**, Researcher at the Italian National Institute of Statistics. **Stefano Pisani**, Research Director at the Italian National Institute of Statistics. **Ulrike Ravens-Sieberer**, Assistant Professor at the Department of Medical Psychology, University of Hamburg. **Malgorzata Rószkiewicz**, Professor at the Institute of Statistics and Demography, Warsaw School of Economics. **Zofia Rusnak**, Assistant Professor at the Department of Statistics and Economic Cybernetics, Wroclaw University of Economics. **Elena Siletti**, Ph.D. Student at the Department of Political Economy, University of Milan. **Adam Szulc**, Professor at the Institute of Statistics and Demography, Warsaw School of Economics. **Achille Vernizzi**, Professor at the Department of Political Economy, University of Milan

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Kung Fu for Face-to-Face Real Combat: with 3D Illustrations

by Shifu King

ISBN 0-9721212-8-5, size 6inx9in, IV/60pp, Aug. 2003, List Price: \$5.95



**Twenty unique and effective ways to hit your enemy using two or more consecutive strikes!
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You risk your life if you expect to knock down your enemy in a real combat by your first and only strike because your enemy might also know how to defense himself using martial art skills. Always be prepared to strike again until your enemy under your fully control. Simple probability theory will tell you that if you have a possibility of half to miss your enemy in each strike, then your enemy only has 1/4 possibility to avoid two consecutive strikes from you. This means your survive rate will increase from 1/2 to 3/4 if you can practice the skills presented in this book.

The biggest challenge of real combat is the changing environments and you don't know your enemy well. It is unlike in the training course where you can expect the kinds of attacking patterns from your teachers or classmates. But do not be afraid to confront your unfamiliar enemy because he also faces the same difficulties as you do. Be patient and wait for or make yourself the next weak link to appear in your enemy's defense network. Remember, nobody can defense both up and down at the same time. Do not let your enemy know your next striking target by distracting his attention away from it. Always show your obvious attacking intention to one side while strike at the other side! Try to generate your attacking patterns randomly such that your enemy can't guess your next strike. If your enemy defenses his body seamlessly, don't be discouraged. Instead, try to use active strike patterns presented in this book to break his fighting patterns that he might be familiar with.

To achieve this, you have to practice the skills in this book many times such that you can make your transients from one strike pattern to another seamlessly and subconsciously. Yes, every strike pattern should be done subconsciously because in real combat your brain will have a massive information flow to handle, you should not waste any brain power on coordinate your hands and legs.

Table of Contents. 1: Kick Knee Joint then Head. 2: Kick Crotch then Face. 3: Hit Face then Kick Crotch. 4: Hit Head then Kick Ankle. 5: Kick Knee Joint then Head. 6: Kick Knee Joint then Kick Belly. 7: Kick Ankle then Head. 8: Kick Knee Joint (Front) then Head. 9: Kick Knee Joint then Hit Head. 10: Kick Knee Joint then Hit Head. 11: Kick Ankle then Hit Face. 12: Kick Knee Joint then Neck. 13: Kick Belly then Face. 14: Kick Ankle (side) then Head. 15: Kick Belly then Head. 16: Kick Ankle then Crotch. 17: Kick Shank then Neck or Head. 18: Hand-Hitting Face and then Knee-Hitting Crotch. 19: Kick Knee Joint and then Hit Chest Using Knee. 20: Kick Crotch then Hit Head by Using Knee.

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