

# Welcome to Prof. Dr. Rubin Wang's Home Page

## Institute for Cognitive Neurodynamics (ICN)

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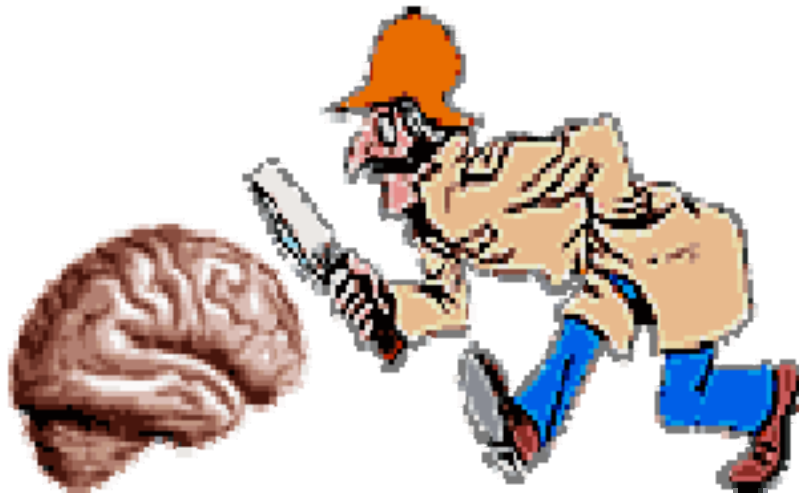


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### **Research fields:**

- (1) Cognitive neural models on learning and memory**
- (2) Coding and decoding theory in brain information processing**
- (3) Complexity theory applied to brain**
- (4) Dynamic analysis of biological neural networks**
- (5) Dynamics model of ionic channels in biomembrane**
- (6) Motor control of biological intelligent system and dynamics analysis**
- (7) Sensory dynamics including computational vision and audition**



### **Experience and Education**

- Professor, East China University of Science and Technology (ECUST), Shanghai, 2006 to present.**
- Professor, Donghua University (DHU), Shanghai, 2001 to 2005.**
- Fellow of Japan of Society for Promotion Science (JSPS), Nagoya University, Nagoya, Japan, 1998-2000.**
- Ph.D in Dept. Electronic-Mechanics Engineering, 1996-1998, Nagoya University, Japan**

- M.S. in Dept. Mechanical Engineering, 1994-1996, Kyushu Sangyo University, Japan
  - Researcher, Kyushu Sangyo University, Japan, 1992-1994
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## Major Grants

- Earmarked Grant: “On the energy principle of brain information processing and neurodynamics analysis” funded by [National Natural Science Foundation of China \(NSFC\)](#), 2009-2011.
  - Earmarked Grant: “Analysis of neurodynamics of a large-scale neural oscillators population in cognitive process” funded by [National Natural Science Foundation of China \(NSFC\)](#), 2007-2009.
  - Earmarked Grant: “The first International Conference on Cognitive Neurodynamics” funded by [National Natural Science Foundation of China \(NSFC\)](#), 2008.
  - Earmarked Grant: “Phase Resetting Mechanism in Neural Dynamic System and Information Processing In Brain” funded by [National Natural Science Foundation of China \(NSFC\)](#), 2003-2005.
  - Earmarked Grant: “Research base of cognitive neurodynamics” funded by [East China University of Science and Technology \(ECUST\)](#), 2006-2008
  - Earmarked Grant: “Diffusion model of neural information flow and computation” funded by [Scientific Research Foundation for the Returned Overseas Chinese Scholars, State Education Ministry](#), 2002-2003.
  - Earmarked Grant: “Chaos dynamics in neural system and chaos response in hippocampus” funded by [Science and Technology Commission of Shanghai Municipality](#), 2003.
  - Earmarked Grant: “Research base of neuroinformatics” funded by [Donghua University](#), 2002-2004.
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## Journal papers since 2005

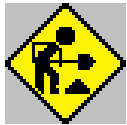
**I am author or co-author of over 100 research papers publications in international journals and conferences.**

1. Rubin Wang, Zhikang Zhang, Guanrong Chen., Energy coding and energy functions for local activities of the brain. *Neurocomputing*. (2009) (in press)
2. Hu Jiyong, Ding Xin, Wang Rubin, Lin Wei, Mechanistic Principles of Sensory Analysis on Fabric Softness by Touch Means. *Chinese Journal of Theoretical and Applied Mechanics*. (2009) (in press)
3. Jianpeng Zhang, Rubin Wang, Enhua Shen, Zhikang Zhang., An exploration of dynamics on neural control mechanism of insect locomotion. *Journal of Dynamics and Control*. Vol.7, No. 1, 29-34 (2009)
4. Rubin Wang, Zhikang Zhang., Neural coding on networks of multi-populations of neural oscillators. *Journal of Dynamics and Control*. (2009) (in press)
5. Xianfa Jiao, Rubin Wang., Synchronous Firing Patterns of Neuronal Population with Excitatory and Inhibitory Connections. *International Journal of Non-linear Mechanics*. (2009) (in press)
6. Enhua Shen, Rubin Wang., Theta phase precession enhancing memory of place sequence in single trial learning. *Journal of Dynamics and Control*. (2009) (in press)
7. Rubin Wang, Fanji Gu, Enhua Shen., Advances in Cognitive Neurodynamics. *Springer*. (2008)
8. Wei Dong, Rubin Wang, Enhua Shen, Zhikang Zhang., The simulation study on the pattern of muscles controlled by CPG in rhythm gait movement. *Journal of Dynamics and Control*. Vol.6, No.4, 327-331 (2008)
9. Rubin Wang, Zhikang Zhang., Guanrong Chen., Energy function and energy

- evolution on neural population, *IEEE Transactions on Neural Networks*. Vol .19, No. 3, 535-538 (2008)
10. Rubin Wang, Zhikang Zhang., Energy coding and energy function in local activities of brain. *Chinese Journal of Theoretical and Applied Mechanics*. Vol. 40, No.2, 238-249. (2008)
  11. Jiong Wu, Rubin Wang, Enhua Shen, Zhikang Zhang., A new algorithm in the trajectory-calculating of human arm movement. *Journal of Vibration and Shock*. Vol.27, No.9, 147-150 (2008)
  12. Rubin Wang, Zhikang Zhang., Energy coding in biological neural network, *Cognitive Neurodynamics*, Vol.1, No.3, 203-212 (2007)
  13. Rubin Wang, Fanji Gu, Editorial. *Cognitive Neurodynamics*, Vol.1, No.1, 1-2 (2007)
  14. Hu Jiyong, Ding Xin, Wang Rubin., Biomechanical Mechanism of Fabric Softness Discrimination. *Fibers and Polymers*, 8(4):372-376 (2007)
  15. Hu Jiyong, Ding Xin, Wang Rubin., Dependence of Tactile Sensation on Deformations Within Soft Tissues of Fingertip. *World Journal of Modeling and Simulation*, 3(1): 73-78 (2007)
  16. Rubin Wang, Zhikang Zhang., Mechanism on brain information processing: energy coding. *Applied Physical Letters*, 89:123903. (2006)
  17. Xianfa Jiao, Rubin Wang., Synchronization in Neuronal Population with the Variable Coupling Strength in the Presence of External Stimulus. *Applied Physical Letters*. 88, 203901 (2006)
  18. Rubin Wang, Xianfa Jiao., A Stochastic Nonlinear Evolution Model and Neural Coding on Neuronal Population Possessing variable coupling Intensity in Spontaneous Behavior. *Neurocomputing*. Vol. 69, No.7-9, 778-785 (2006)
  19. Rubin Wang, Zhikang Zhang, Jing Yu., Mechanism of Neurodynamics on Learning and Memory. *Chinese Journal of Theoretical and Applied Mechanics*. Vol.38, No.6, 816-824 (2006)
  20. Rubin Wang, Wei Yu., Stochastic nonlinear evolution model of the large-scale neuronal population and dynamic neural coding subject to stimulation. *Journal of*

*Biomedical Engineering*. 23(2), 243-247. (2006)

21. Rubin Wang, Zhikan Zhang., On energy principle of coupling neural activities. *Acta Biophysica Sinica*. Vol.21, No.6, 436-442. (2005)
  22. Xianfa Jiao, Rubin Wang., Nonlinear dynamic model and neural coding of neuronal network with the variable coupling strength in the presence of external stimuli. *Applied Physical Letters*. 87:083901 (2005)
  23. Xianfa Jiao, Rubin Wang., Nonlinear Stochastic Evolution Model of Variable Coupled Neuronal Oscillator Population in the Presence of External Stimuli. *Control and Decision*. Vol.20, No.8, 897-900. (2005)
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## Professional Services

- Editor-in-Chief, *Cognitive Neurodynamics*. (<http://www.springer.com/11571>)
  - Editor board member, *International Journal of Molecular Science*. (<http://www.mdpi.org/ijms/>)
  - Conference Chair, *The First International Conference on Cognitive Neurodynamics (ICCN2007)*. (<http://www.iccn2007.org>)
  - Conference Chair, *The First International Conference on Cognitive Neurodynamics (ICCN2009)*. (<http://www.iccn2009.org>)
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## Invited Talker and Seminars

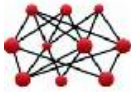
1. Exploration of dynamics on moving mechanism of growth cone. **International Symposium on Renters in Molecular Science 2002.**
2. Analysis of dynamics of the phase resetting on the set of the population of

- neurons. **Neurobiology and Neuronal Information 2002 (NBNI02)**. Japan. 2002
3. **Brain information processing and nonlinear random mechanics**. **Ocean University of China**. 2003
  4. **Evolution model and phase encoding on neural populations**. **Brain Science Institute of Japan (BSI)**. 2003
  5. **Research progress on stochastic phase resetting dynamics**. **Shanghai Jiaotong University**. 2004
  6. **Application and perspective on brain information processing**. **Donghua University**. 2004
  7. **An overview in application of cognitive neurodynamics on nonlinear stochastic dynamics**. **Conference on Nonlinear dynamics, Vibration and Control of China 2004**.
  8. **A review on application of brain information processing in nonlinear stochastic dynamics**. **Brain Science Institute of Japan (BSI)**. Japan. 2005
  9. **Stochastic phase resetting dynamics on Large-scale neural population**. **Tokyo University**. Japan. 2005
  10. **Energy principle on coupled neurons activities**. **Conference on Chinese of Theoretical Applied Mechanics 2005**.
  11. **New mechanism of brain information processing — energy coding**. **East China University of Science and Technology**. 2005
  12. **Advances in Neural Information Processing for Large-scale Neural Populations**. **City University of Hong Kong and Hong Kong Polytechnic University**. 2006
  13. **Neuroinformatics and Cognitive Neurodynamics**. **The Hong Kong University of Science and Technology**. 2007
  14. **Energy coding in Cerebral cortex**. **Brain Science Institute, Tamagawa University, Japan**. 2008
  15. **Mechanism on brain information processing: energy coding**. **Shinshu University, Japan**. 2008

16. **Advances in neural information processing. Hong Kong Polytechnic University.** 2008

17. **Neural coding and Neurodynamics. South China University of Science and Technology.** 2009

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## Academic activity

- The 1th International Conference on Cognitive Neurodynamics  
(<http://www.iccn2007.org>) ---- Conference Chair
- The 2th International Conference on Cognitive Neurodynamics  
(<http://www.iccn2009.org>) ---- Conference Chair
- The Third International Conference on Dynamics, Vibration, and Control. (<http://saa.zju.edu.cn/icdve2010>)  
---- Scientific Committee Member
- The Sixth International Symposium on Neural Networks. (2009)  
<http://www.mae.cuhk.edu.hk/~isnn2009>  
---- Program Committee Member
- 2009 International Joint Conference on Neural Networks.  
<http://www.ijcnn2009.com> ---- Program Committee Member
- The 4<sup>th</sup> International Conference on Natural Computation (ICNC'08)  
and the 5<sup>th</sup> International Conference on Fuzzy Systems and  
Knowledge Discovery (FSKD'2008) ---- Program Committee Member



[\(http://www.icnc-fskd2008.sdu.edu.cn/\)](http://www.icnc-fskd2008.sdu.edu.cn/)

- The Fifth International Symposium on Neural Networks (2008).

[\(http://www2.mae.cuhk.edu.hk/~isnn2008/\)](http://www2.mae.cuhk.edu.hk/~isnn2008/)

---- Program Committee Member

- The Second International Conference on Dynamics, Vibration and Control 2006. (<http://www.icdvc.org/>)

---- Scientific Committee Member

- The First International Conference on Natural Computation, The Second International Conference on Fuzzy Systems and Knowledge Discovery 2005. (<http://www.ntu.edu.sg/home/elpwang/nc2005/cfp.pdf>)

---- Program Committee Member

- The 8<sup>th</sup> Chinese Conference on Dynamics and Control

<http://www.cstam.org.cn/show.asp?unid=2006052841>)

---- Scientific Committee Member

- The 12<sup>th</sup> Chinese Conference on Nonlinear Vibration. (2009)

---- Scientific Committee Member



**Merit Recognition**

**Listed in *Who's Who in the World, Who's Who in Science and Engineering, Barons Who's Who: The Asia 500*, among others.**

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