Curriculum Vitae

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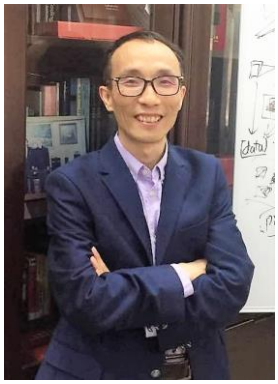

GENERAL DESCRIPTION

Badong Chen received the B.S. and M.S. degrees in control theory and engineering from Chongqing University, in 1997 and 2003, respectively, and the Ph.D. degree in computer science and technology from Tsinghua University in 2008. He was a Postdoctoral Researcher with Tsinghua University from 2008 to 2010, and a Postdoctoral Associate at the University of Florida Computational NeuroEngineering Laboratory (CNEL) during the period October, 2010 to September, 2012. During July to August 2015, he visited the Nanyang Technological University (NTU) as a visiting research scientist. Currently he is a professor at the Institute of Artificial Intelligence and Robotics (IAIR), Xi'an Jiaotong University. His research interests are in signal processing, information theory, machine learning, and their applications to cognitive science and neural engineering. He has published 2 books, 4 chapters, and over 200 papers in various journals and conference proceedings. Dr. Chen is an *IEEE senior member* and an associate editor of *IEEE Transactions on Neural Networks and Learning Systems* and *Journal of The Franklin Institute*, and has been on the editorial board of *Entropy*.

EDUCATION

- Ph. D. in Computer Science and Technology, Tsinghua University, Beijing, China, June 2008
- M.S. in Control Theory and Engineering, Chongqing University, Chongqing, China, June 2003
- B.S. in Automatic Control, Chongqing University, Chongqing, China, June 1997

WORK EXPERIENCE

- Oct., 2012 - Present
  Professor, Institute of Artificial Intelligence and Robotics, Xi'an Jiaotong University
- Oct., 2010 - Sept., 2012
  Post-doctoral, Department of Electrical and Computer Engineering (ECE), University of Florida

- July, 2008 - Aug., 2010
  Post-doctoral, Department of Precision Instruments and Mechanology, Tsinghua University
- July, 2003 - July, 2004
  Software Engineer, ANYKA Software Co. Ltd., Guangzhou, China
- July, 1997 - July, 2000
  Assistant Engineer, CHANGHONG Co. Ltd., Mianyang, Sichuan, China

ACADEMIC ACTIVITIES

Membership:

IEEE Senior Member (2013 -)
IEEE CIS Technical Committee on Cognitive and Developmental Systems (2017-)
IEEE SPS Machine Learning for Signal Processing (MLSP) Technical Committee Member (2018-)

Editorial Activities:

Guest Edior of Special Issue "Smart Healthcare: Artificial Intelligence with Applications in Biomedicine" in *Journal of Ambient Intelligence and Humanized Computing* (2017).
Guest Editor of Special Issue "*Neural Information Engineering*" in *Engineering* (2017).
Guest Editor of Special Issue "*Entropy in Signal Analysis*" in *Entropy* (2016)
Associate Editor of *Journal of the Franklin Institute* (2015 -)
Guest Editor of Special Issue "*Information Theoretic Learning*" in *Entropy* (2015)
Editorial Board of *Entropy* (2014 -)
Associate Editor of *IEEE Trans. on Neural Networks and Learning Systems* (2013 -)

Conference Activities:

Program Committee Member, 32nd AAAI Conference on Artificial Intelligence, AAAI 2018, New Orleans, Lousiana, USA.
Program Committee Member, IEEE International Workshop on Machine Learning for Signal Processing (MLSP2017), Tokyo, Japan.
Associate Editor, 2017 IEEE International Conference on Multisensor Fusion and Integration for Intelligent *Systems* (MFI 2017), Daegu, Korea, 2017
Program Committee Member, 31st AAAI Conference on Artificial Intelligence, AAAI 2017, San Francisco, California, USA.
Member of the Program Committee, The 2016 IEEE Symposium on Neuromorphic Systems and Cyborg Intelligence (SNCI'16), Athens, Greece, 2016
Member of the Program Committee, The 7th Chinese Conference on Pattern Recognition, *CCPR* 2016, Chengdu, China
Co-Chair of the Invited Session on "Recent Advances on Adaptive Filtering and Its Applications*",* the 35th Chinese Control Conference (CCC), Chengdu, China, 2016
Special Session Organizer, IJCNN, Vancouver, Canada, 2016
Session Chair, 8th International Conference on Knowledge Science, Engineering and Management (*KSEM2015*)
Technical Program Co-Chair, *International Workshop on Vision, Communications and Circuits*, Keio University, Japan, 2015
Scientific Advisory Committee, *The 2nd International Electronic Conference on Entropy and Its Applications*, 2015.
Special Session Organizer, *2015 IEEE International Conference on Digital Signal Processing* (DSP 2015), Singapore.
Member of the Program Committee, *Workshop on Graph-based Representations in Pattern*

Recognition (GbR2015), Beijing, China, 2015.
Member of the Technical Program Committee, IJCNN, Beijing, China, 2014.
Publicity Chair, The Brain-Mind Workshop (BMW) , Beijing, China, 2013.

INVITED TALKS

- "*Neural Decoding from fMRI*", invited speech at Inernational Symposium on Computational and Cyborg Intelligence & IEEE CIS Winter School, Nov.14, 2017, Hangzhou, China
- "*Correntropic Measures Based Robust and Sparsity-aware Learning*", invited talk at the 10th International Conference on Intelligent Robotics and Applications (ICIRA 2017), August 17, 2017, Wuhan, China.
- "*Information Theoretic Learning*", August 16, 2017, Huazhong University of Science and Technology, Wuhan, China.
- "*Correntropy for Robust and Sparsity-aware Learning*", June 21, 2017, Beijing Institute of Technology, Beijing, China.
- "*Statistical Similarity Measures in Kernel Space*", October 18, 2016, North China Electric Power University, Beijing, China.
- "*Nonlinear Statistical Similarity Measures in Kernel Space",* July 6, 2016, IEEE CIS Summer School, Chengdu, China.
- "*Local Similarity Measures for Robust and Sparsity-aware Learning* ", June 2, 2016, Nangjing University of Posts and Telecommunications, Nanjing, China.
- "*Robust Learning with Similarity Measures in Kernel Space*", May 30, 2016, University of Science and Technology Beijing, Beijing, China.
- "*Visual-Cognitive Coding and Decoding Based on fMRI and its Application Prospects in Advanced Robot Systems*" , May 14,2016, Invited Speaker at 2016 International Forum on Core Component and Key Technology for Robot, Xi'an, China.
- "*Correntropic Losses for Robust and Sparsity-aware Learning*", April 25, 2016, Invited Talk at International Workshop on Computer Vision and Signal Processing (CVSP'16), Xi'an Jiaotong University, Xi'an, China.
- "*Online Kernel Learning for Neural Decoding*", Nov. 24, 2015, Southwest University, Chongqing, China.
- "*Similarity Measures in Kernel Space with Applications to Robust Signal Processing and Machine Learning*", Nov. 3, 2015, Invited Speaker at TENCON 2015, Macau, China.
- "*Robust and Sparsity-Aware Similarity Measures in Kernel Space*", Nov. 2, 2015, Yukawa Laboratory, Keio University, Japan.
- "*Kernel Adaptive Filtering with Applications to Neural Decoding*", Aug. 14, 2015, School of Electrical and Electronic Engineering, Nanyang Technological University (NTU), Singapore.
- "*Similarity Measures in Kernel Space*", Dec. 10, 2014, School of Electrical and Electronic Engineering, Nanyang Technological University (NTU), Singapore.
- "*Brain Cognitive Function Decoding and Modeling*", July 31, 2014, Institute of Artificial Intelligence and Robotics, Xi'an Jiaotong University, Xi'an, China.
- "*Some Recent Advances on Kernel Adaptive Filtering*", July 25, 2013, Lab of Prof. X. Rong Li, Xi'an Jiaotong University, Xi'an, China.
- "*Quantifying Cognitive States of the Human Brain using Measures of Dependence*", Summer School on Intelligent Vehicle, July 8-12, 2013, Xi'an Jiaotong University, Xi'an, China.
- "*Perception Action Cycle Learning*", Symposium on Cognitive Science, April 22-23, 2013, Xi'an Jiaotong University, Xi'an, China.
- "*Information Theoretic Learning and Kernel Adaptive Filtering*", March 9, 2013, Institute of Artificial Intelligence and Robotics, Xi'an Jiaotong University, Xi'an, China.
- "*Kernel Adaptive Filtering*", October 20, 2012, Tsinghua University, Beijing, China.

SPONSORED RESEARCH PROJECTS

1. PI, "Human-Machine Cooperative Interaction Methods and Application for Dexterous and Complaisant Lower Limb Rehabilitation Robot", National Natural Science Foundation of China (No. 91648208), 3,000,000 RMB, 2017.1-2020.12
2. PI, "Visual Cognition Encoding and Decoding for Advanced Brain Machine Interfaces", National Basic Research Program of China (973 Program) (No. 2015CB351703), 6,300,000 RMB, 2015.1-2019.12
3. PI, "New methods and applications of adaptive filtering in reproducing kernel Hilbert space",National Natural Science Foundation of China (No. 61372152), 800,000 RMB, 2014.1-2017.12
4. PI, " Research on survival information theoretic learning", Key Laboratory Young Academic Backbone Construction Project, 150,000 RMB, 2013.3-2014.3
5. PI, "Nonlinear system parameter identification based on the error entropy criterion", National Natural Science Foundation of China (No. 60904054), 195,000 RMB, 2010.1-2012.12
6. PI, "Nonlinear modeling and control of a six degree of freedom maglev precision stage", China Postdoctoral Science Foundation (No. 20080440384), 30,000 RMB, 2009.7-2010.7

SELECTED PUBLICATIONS

1) Hong Ji, Nathan Petro, **Badong Chen***, Zejian Yuan, Jianji Wang, Nanning Zheng, Andreas Keil, Cross Multivariate Correlation Coefficients as Screening Tool for Analysis of Concurrent EEG-fMRI Recordings. To appear in *Journal of Neuroscience Research.*
2) Siyuan Peng, Wee Ser, **Badong Chen***, Lei Sun, Zhiping Lin, Robust constrained adaptive filtering under minimum error entropy criterion. To appear in IEEE *Transactions on Circuits and Systems II: Express Briefs.*
3) Wentao Ma, Dongqiao Zheng, Zhiyu Zhang, **Badong Chen**, Proportionate NLMS with Unbiasedness Criterion for Sparse System Identification in the Presence of Input and Output Noises. To appear in *IEEE* Transactions *on Circuits and Systems II: Express Briefs*.
4) Nan Zhou, Yangyang Xu, Hong Cheng, Zejian Yuan, Badong Chen, Maximum Correntropy Criterion based Sparse Subspace Learning for Unsupervised Feature Selection. To appear in *IEEE Transactions on Circuits and Systems for Video Technology.*
5) Yongqiang Ma, Hao Wu, Mengjiao Zhu, Pengju Ren, Nanning Zheng, **Badong Chen***, Reconstruction of Visual Image from Functional Magnetic Resonance Imaging Using Spiking Neuron Model. To appear in *IEEE Transactions on Cognitive and Developmental Systems*
6) Jianji Wang, Nanning Zheng, Feiyue Wang, **Badong Chen**, Pei Chen, Bao Xi, Shitao Chen, Ziyi Liu, Multivariate Correlation Entropy and Law Discovery in Large Data Sets. To appear in *IEEE Intelligent Systems*
7) Le Zhang, Chunqiu Zheng, Tian Li, Lei Xing, Han Zeng, Tingting Li, Huan Yang, Jia Cao, **Badong Chen*** and Ziyuan Zhou*, Building up a robust risk mathematical platform to predict colorectal cancer. To appear in *Complexity*
8) Lei Sun, Zuren Feng, **Badong Chen**, Na Lu, A Contralateral Channel Guided Model for EEG Based Motor Imagery Classification. To appear in *Biomedical Signal Processing and Control*
9) Bin Xu, Daipeng Yang, Zhongke Shi, Yongping Pan, **Badong Chen,** Fuchun Sun, Online Recorded Data Based Composite Neural Control of Strict-feedback Systems with Application to Hypersonic Flight Dynamics. To appear in *IEEE Trans. on Neural Networks and Learning Systems*
10) Lu Lu, Haiquan Zhao, **Badong Chen**, Robust Adaptive Algorithm for Smart Antenna System with α-Stable Noise. To appear in *IEEE Transactions on Circuits and Systems II: Express Briefs*

11) Shiyuan Wang, Lujuan Dang, **Badong Chen**, Chengxiu Ling, Lidan Wang, Shukai Duan, Kernel Online Learning Algorithm with Scale Adaptation. To appear in *IEEE Transactions on Circuits and Systems II: Express Briefs*
12) **Badong Chen,** Lei Xing, Xin Wang, Jing Qin, Nanning Zheng, Robust Learning with Kernel Mean p-Power Error Loss. To appear in *IEEE Transactions on Cybernetics*
13) Rongjing Bao, Haijun Rong, Plamen Angelov, **Badong Chen**, Pak-kin Wong, Correntropy-Based Evolving Fuzzy Neural System. To appear in *IEEE Transactions on Fuzzy Systems*
14) Shitao Chen, Songyi Zhang, Jinghao Shang, **Badong Chen**, Nanning Zheng, Brain Inspired Cognitive Model with Attention for Self-Driving Cars, to appear in *IEEE Transactions on Cognitive and Developmental Systems*
15) Qingqing Zheng, Fengyuan Zhu, Jing Qin, **Badong Chen**, Pheng-Ann Heng, Sparse Support Matrix Machine. To appear in *Pattern Recognition*.
16) Jing Yang, Feng Ye, Hai-Jun Rong, **Badong Chen,** Recursive least mean p-power extreme learning machine, *Neural Networks*, vol. 91, pp. 22-33, 2017
17) Fei Zhu, Abderrahim Halimi, Paul Honeine, **Badong Chen,** Nanning Zheng, Correntropy Maximization via ADMM-Application to Robust Hyperspectral Unmixing, *IEEE Trans. on Geoscience and Remote Sensing,* vol.55, pp. 4944-4955,2017
18) Dapeng Chen, Zejian Yuan, Jingdong Wang, **Badong Chen**, Gang Hua, Nanning Zheng, Exemplar-Guided Similarity Learning on Polynomial Kernel Feature Map for Person Re-identification, *International Journal of Computer Vision,* vol. 123, pp. 392-414, 2017
19) Nanning Zheng, Ziyi Liu, Pengju Ren, Yongqiang Ma, Siyu Yu, Jianru Xue, **Badong Chen**, Feiyue Wang, Hybrid-augmented intelligence: collaboration and cognition, *Frontiers of Information Technology & Electronic Engineering*, 2017, 18 (2): 153-179
20) **Badong Chen**, Lei Xing, Bin Xu, Haiquan Zhao, Nanning Zheng, Jose Principe, Kernel Risk-Sensitive Loss: Definition, Properties and Application to Robust Adaptive Filtering, *IEEE Trans. on Signal Processing*, vol.65, no.11, pp.2888-2901, 2017.
21) **Badong Chen**, Lei Xing, Bin Xu, Haiquan Zhao, Jose C. Principe, Insights into the Robustness of Minimum Error Entropy Estimation. To appear in *IEEE Trans. on Neural Networks and Learning Systems*
22) Lu Lu, Haiquan Zhao, **Badong Chen**, Collaborative adaptive Volterra filters for nonlinear system identification in α-stable noise environments. *Journal of the Franklin Institute*,353 (17), 4500-4525, 2016
23) **Badong Chen**, Xi Liu, Haiquan Zhao, Jose C. Principe, Maximum Correntropy Kalman Filter. *Automatica* 76 (2017) 70-77
24) Bin Xu, Fuchun Sun, Yongping Pan, **Badong Chen**, Disturbance Observer Based Composite Learning Fuzzy Control of Nonlinear Systems with Unknown Dead Zone. To appear in *IEEE Transactions on Systems, Man and Cybernetics: Systems*
25) **Badong Chen**, Lei Xing, Haiquan Zhao, Nanning Zheng, Jose C. Principe, Generalized correntropy for robust adaptive filtering. *IEEE Trans. on Signal Processing*, vol. 64, no. 13, pp. 3376-3387, 2016
26) Dapeng Chen, Zejian Yuan, **Badong Chen**, Nanning Zheng, Similarity Learning with Spatial Constraints for Person Re-identification, *CVPR 2016*, Las Vegas, Nevada, USA, June 26 - July 1, 2016
27) Haiquan Zhao, Xiangping Zeng, Zhengyou He, Zheng Cao, Shujian Yu, **Badong Chen**, Improved functional link artificial neural network via convex combination for nonlinear active noise control. *Applied Soft Computing*, vol. 42, pp. 351-359, 2016
28) Lu Lu, Haiquan Zhao, **Badong Chen**, Improved Variable Forgetting Factor Recursive Algorithm based on the Logarithmic Cost for Volterra System Identification. *IEEE Transactions on Circuits and Systems II: Express Briefs*, 63 (6), 588-592, 2016
29) Shengyu Nan, Lei Sun, **Badong Chen***, Zhiping Lin, Kar-Ann Toh, Density-dependent quantized least squares support vector machine for large data sets. *IEEE Trans. on Neural Networks and Learning Systems,* vol. 28, no. 1, pp. 94-106, 2017

30) Junli Liang, Guoyang Yu, **Badong Chen,** Minghua Zhao, Decentralized Dimensionality Reduction for Distributed Tensor Data across Sensor Networks. *IEEE Trans. on Neural Networks and Learning Systems,* vol.27, no.11, 2174-2186, 2016.
31) **Badong Chen,** Jianji Wang, Haiquan Zhao, Nanning Zheng, Jose C. Principe, Convergence of a Fixed-Point Algorithm under Maximum Correntropy Criterion. *IEEE Signal Processing Letters*, 22 (10): 1723-1727, 2015.
32) Yuanliu Liu, Zejian Yuan, **Badong Chen**, Jianru Xue, Nanning Zheng, Illumination Robust Color Naming via Label Propagation. *Proc. ICCV* 2015, Santiago, Chile.
33) Jose C. Principe, **Badong Chen**, Universal Approximation with Convex Optimization: Gimmick or Reality? *IEEE Computational Intelligence Magazine,* vol. 10, no. 2, pp. 68-77, 2015.
34) **Badong Chen,** Lei Xing, Junli Liang, Nanning Zheng, Jose C. Principe, Steady-state Mean-square Error Analysis for Adaptive Filtering under the Maximum Correntropy Criterion. *IEEE Signal Processing Letters*, 21 (7): 880-884, 2014.
35) Pingping Zhu, **Badong Chen,** Jose C. Principe, Learning Nonlinear Generative Models of Time Series with a Kalman Filter in RKHS. *IEEE Trans. on Signal Processing,* vol. 62, 141-155, 2014.
36) Songlin Zhao, **Badong Chen**, Jose. C. Principe, Fixed budget quantized kernel least mean square algorithm, *Signal Processing,* vol. 93, 2759-2770, 2013.
37) **Badong Chen**, Songlin Zhao, Pingping Zhu, Jose C. Principe, Quantized kernel recursive least squares algorithm, *IEEE Trans. on Neural Networks and Learning Systems,* vol. 24, no. 9, 1484-1491, 2013.
38) Bilal Fadlallah, **Badong Chen,** Andreas Keil, Jose. C. Principe, Weighted permutation entropy: a complexity measure for time series incorporating amplitude information, *Physical Review E,* vol. 87, no. 2, 022911, 2013.
39) Lin Li, Park Il Memming, Brockmeier Austin, **Badong Chen**, Sohan Seth, Francis Joseph, Sanchez Justin, Jose. C. Principe, Adaptive inverse control of neural spatiotemporal spike patterns with a reproducing kernel Hilbert space (RKHS) framework, *IEEE Transactions on Neural Systems and Rehabilitation Engineering,* vol 21, no. 4, 532-543, 2013
40) **Badong Chen**, Jose. C. Principe, Maximum correntropy estimation is a smoothed MAP estimation, *IEEE Signal Processing Letters.,* vol. 19, no. 8, 2012.
41) **Badong Chen**, Songlin Zhao, Pingping Zhu, Jose. C. Principe, Mean square convergence analysis of the kernel least mean square algorithm, *Signal Processing*, 92 (2012), 2624-2632.
42) Pingping Zhu, **Badong Chen,** Jose. C. Principe, A novel extended kernel recursive least squares algorithm, *Neural Networks,* vol. 32, 349-357, 2012.
43) **Badong Chen,** Pingping Zhu, Jose. C. Principe, Survival information potential: a new criterion for adaptive system training. *IEEE Trans. on Signal Processing,* vol. 60, no. 3, pp. 1184- 1194, 2012.
44) **Badong Chen**, Songlin Zhao, Pingping Zhu, Jose. C. Principe, Quantized kernel least mean square algorithm. *IEEE Trans. on Neural Networks and Learning Systems,* vol. 23, no. 1, pp. 22-32, 2012.
45) Yu Liu, Ming Zhang, Yu Zhu, Jin Yang, **Badong Chen**, Optimization of voice coil motor to enhance dynamic response based on an improved magnetic equivalent circuit model, *IEEE Transactions on Magnetics, v*ol. 47, 2247-2251, 2011.
46) **Badong Chen,** Yu Zhu, Jinchun Hu, Jose. C. Principe, Delta-entropy: Definition, properties and applications in system identification with quantized data, *Information Sciences*, vol. 181, 1384-1402, 2011.
47) **Badong Chen,** Yu Zhu, Jinchun Hu, Mean-Square Convergence Analysis of ADALINE Training with Minimum Error Entropy Criterion, *IEEE Transactions on Neural Networks,* vol.27, no.1, 1168-1179, 2010.
48) **Badong Chen**, Yu Zhu, Jinchun Hu, Ming Zhang, On optimum estimations with minimum error entropy criterion, *Journal of the Franklin Institute,* vol.347, no.2, 545-558, 2010.
49) Wei Min, Ming Zhang, Yu Zhu, **Badong Chen**, Guanghong Duan, Jinchun Hu, and Wensheng Yin, Analysis and Optimization of a New 2-D Magnet Array for Planar Motor. *IEEE Transactions on Magnetics*, vol. 46, no. 5, 2010.