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**NAME**

Chin-Teng (CT) Lin, Ph.D.

**POSITION TITLE**Distinguished Professor  
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Computational Intelligence &amp; Brain-Computer Interface Centre, UTS

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**EDUCATION/TRAINING**

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
National Chiao Tung University, Taiwan	B.S.	1986	EE
Purdue University, West Lafayette, IN., USA	M.S.	1989	EE
Purdue University, West Lafayette, IN., USA	Ph.D.	1992	EE



## A. Personal Statement

My main research goal focuses on machine intelligent systems, including algorithm development and system design. The research areas span from fundamental electronic circuits to signal and information processing, and to system realization and evaluation. The short-term research objective is to exploit computational intelligence methodologies for Brain-Machine Interface, and the long-term goal is to incorporate bio-inspired, brain-like computational capabilities into next-generation computers and robots.

My current research interests include the following domains:

Computational intelligence, fuzzy neural networks (FNN), cognitive neuro-engineering, brain-computer interface, multimedia information processing, machine learning, robotics, and intelligent sensing and control.

I devoted myself to the research of Computational Intelligence (CI) since her infant stage of early 1990's. I took the lead in developing the models of fuzzy neural networks (FNN), which have now become one of the most prevailing research areas in CI. Since 1996, the Intelligent Information Technology (iIT) has been my major research interest. In 2003, I founded the Brain Research Center (BRC) at the National Chao-Tung University (NCTU) and served as its director to this day. By applying the CI and iIT to the research of cognition neuroscience, I have focused mainly on the area of Translational Neuroscience since 2003, trying to bring basic findings in neuroscience into daily life applications. To achieve this goal, I have focused on 2 major problems: Natural Cognition and Brain-Computer Interface (BCI). Natural cognition studies the brain and its behavior at work. One major research problem is the study of brain dynamics of alertness, drowsiness, motion sickness, distraction, orientation, etc. during driving. For real-world applications of BCI, we have designed wearable and wireless devices for measuring brain waves (EEG signals) with dry sensors and developed algorithms for brain waves analysis. The Brain Research Center is now a platform for conducting various interdisciplinary research activities in cognition neuroscience and engineering.

I am the Director of the Computational Intelligence & Brain-Computer Interface Centre (CI-BCI) at UTS, which opened in February 2016. The CI-BCI Lab aims to exploit computational intelligence methodologies for brain computer interfaces with the long-term objective of incorporating bio-inspired brain-like computational capabilities into next generation computers and robots. In addressing these objectives, the CI-BCI Lab will focus on two core programs – (i) mobile sensing technologies of brain EEG (electroencephalography) waves with high comfort and (ii) assessment of human cognitive states from sensed brain activity and other physiological signals.

## B. Positions and Honors

### Positions and Employment

Prior to joining UTS on 1 Feb. 2016, Lin was a fulltime academic staff member at National Chiao-Tung University (NCTU), Taiwan where he has been actively involved in research and both postgraduate and undergraduate teaching since 1992. Over the past 24 years, he has had excellent research opportunities in the following roles:

- Professor, Department of Electrical Engineering, NCTU, Taiwan (1992-2015)
- Director, Brain Research Center, NCTU, Taiwan (2003-2015)
- Lifetime Chair Professor, NCTU, Taiwan (2010-)
- International Faculty, UCSD, US (2012-)
- Honorary Professorship of University of Nottingham, England, UK (2014-)
- Fellow, Institute of Electrical and Electronic Engineers (IEEE) (2005-)
- Fellow, International Fuzzy Systems Association (2012-)
- Editor-in- Chief, IEEE Trans. on Fuzzy Systems (2011-2016)
- Distinguished Professor, UTS, Australia (2016-)

### Awards and Other Professional Activities:

- IEEE Fuzzy Systems Pioneer Awards, IEEE Computational Intelligence Society (2017)
- Outstanding Achievement Award by Asia Pacific Neural Network Assembly (2013)
- IEEE Distinguished Lecture Speaker (2003-2005, 2015-2017).
- Outstanding Electrical and Computer Engineer, Purdue University (2011).
- Merit NSC Research Fellow Award, NSC, Taiwan, 2009.
- Taiwan Outstanding Information-Technology Expert Award, 2002.
- The 38th Ten Outstanding Rising Stars in Taiwan granted by International Junior Chamber-Taiwan Chapter, 2000.
- Outstanding Engineering Professor Award, the Chinese Institute of Engineering, 2000.
- Outstanding Academy-Industry Cooperation Achievement Award, MOE, Taiwan, 2000.
- Outstanding Electrical Engineering Professor Award, the Chinese Institute of Electrical Engineering, 1997.
- Outstanding Research Award, NSC, Taiwan, since 1996.

I have served as Editor-In-Chief (EIC) or Associate Editor (AE) on the following journals:

- EIC, IEEE Trans. on Fuzzy Systems (2011-2016)
- Founding EIC, Journal of Neuroscience and Neuroengineering, (2012-)
- Deputy EIC, IEEE Trans. on Circuits and Systems II (2006-2007)
- AE, IEEE Trans. on Systems, Man, Cybernetics, Part B (2002-)
- AE, IEEE Trans. on Fuzzy Systems (2002-2010)

## C. Publications (selected)

(Total Citation: ~15,420, H-index: 56, i10-index: 193)

### Scholarly Books

1. **C. T. Lin**† and C. S. G. Lee, Neural Fuzzy Systems: A Neuro-Fuzzy Synergism to Intelligent Systems (with disk), Prentice Hall, 1996, 797 pages (ISBN 0-13-261413-8).
2. **C. T. Lin**†, Neural Fuzzy Control Systems with Structure and Parameter Learning, World Scientific, 1994, 127 pages (ISBN 981-02-1613-0).

### Refereed Journal Articles

3. C. Liang, **C. T. Lin**, S. N. Yao, W. S. Chang, Y. C. Liu, and S. A. Chen, "Visual Attention and Association: An Electroencephalography Study in Expert Designers," *Design Studies*, Vol. 48, pp. 76-95, 2017. DOI: 10.1016/j.destud.2016.11.002. (SCI IF = 2.070, 15/85, 17.65%, 5-year = 2.652, 12/85, 14.12%, Engineering Multidisciplinary)
4. Y. T. Liu, Y. Y. Lin, S. L. Wu, A. Marathe, N. Pal, C. H. Chuang, J. T. King, and **C. T. Lin**, "Weighted Fuzzy Dempster-Shafer Framework for Multi-Modal Information Integration," accepted by *IEEE Transactions on Fuzzy Systems*, Nov. 2016. (ERA Tier **A\*** journal)

5. D. Wu, V. Lawhern, S. Gordon, B. Lance, and **C. T. Lin**, "Driver Drowsiness Estimation from EEG Signals Using Online Weighted Adaptation Regularization for Regression (OwARR)," accepted by *IEEE Transactions on Fuzzy Systems*, Oct. 2016. (ERA Tier **A\*** journal)
6. O. Kaiwartya, H. Abdullah, Y. Cao, A. Altameen, M. Prased, **C. T. Lin**, and X. Liu, "Internet of Vehicles: Motivation, Layered Architecture Network Model Challenges and Future Aspects," *IEEE access*, Vol. 4, pp. 5356-5373, Sep. 2016.
7. P. Gupta, **C. T. Lin**, M. K. Mehlawat, and N. Grover, "A New Method for Intuitionistic Fuzzy Multiattribute Decision Making," *IEEE Transactions on Systems, Man, And Cybernetics: Systems*, Vol. 46, No. 9, pp.1167- 1179, Sep. 2016. (ERA Tier **A** journal)
8. Y. H. Yu, S. H. Chen, C. L. Chang, **C. T. Lin\***, W. D. Hairston, R. A Mrozek, "New Flexible Silicone-based EEG Dry Sensor Material Compositions Exhibiting Improvements in Lifespan, Conductivity and Reliability," *Sensors*,16(11), pp. 1826, Oct. 2016.
9. Z. H. Cao, **C. T. Lin**, C. H. Chuang, K. L. Lai, A. C. Yang, J. L. Fuh, and S. J. Wang, "Resting-state EEG Power and Coherence Vary between Migraine Phases," *The journal of Headache and Pain*, Vol. 17, No. 1, pp. 102, Oct. 2016.
10. Y. T. Liu, C. H. Chuang, J. M. Wang, and **C. T. Lin**, "Changes in Alertness and the EEG Effective Connectivity in a Sustained-Attention Driving Task," accepted by *Journal of Neuroscience and Neuroengineering*, 2016.
11. M. Prased and **C. T. Lin**, "A Novel Fuzzy Logic Model for Pseudo Relevance Feedback based on Query Expansion," accepted by *International Journal of Fuzzy Systems*, 2016.
12. D. L. Li, M. Prasad, **C. T. Lin\***, and J. Y. Chang, "Self-Adjusting Feature Maps Network and Its Applications," *Neurocomputing*, Vol. 207, pp. 78-94, Sep. 2016.
13. K. C. Huang, T. Y. Huang, C. H. Chuang, J. T. King, **C. T. Lin**, and T. P. Jung, "An EEG-based Fatigue Detection and Mitigation System," *International Journal of Neural Systems*, Vol. 26, No.4, 2016. (Published Online 11 April 2016)
14. S. W. Chuang, C. H. Chuang, Y. H. Yu, J. T. King, and **C. T. Lin**, "EEG Alpha and Gamma Modulators Mediate Motion Sickness-Related Spectral Response," *International Journal of Neural systems*, Vol 26, Issue02, March. 2016.
15. S. L. Wu, Y. T. Liu, T. Y. Hsieh, Y. Y. Lin, C. Y. Chen, C. H. Chuang, and **C. T. Lin**, "Fuzzy Integral with Particle Swarm Optimization for a Motor-Imagery-based Brain-Computer Interface," accepted by *IEEE Transactions on Fuzzy Systems*, 2016. (ERA Tier **A\*** journal)
16. Y. T. Liu, **C. T. Lin**, C. H. Chuang, Y. K. Wang, S. H. Huang, J. T. King, S. A. Chen, and S. W. Lu, "Novel Neurotechnology and Computational Intelligence Method Applied to EEG-based Brain-Computer Interfaces," accepted by *IEEE Systems, Man, and Cybernetics Magazine*, 2016.
17. \***Y. H. Yu**, **S. W. Lu**, **C. H. Chuang**, **J. T. King**, **C. L. Chang**, **S. A. Chen**, and **C. T. Lin†**, "An Inflatable and Wearable Wireless System for Making 32-Channel Electroencephalogram Measurements," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, Vol. 24, No. 7, pp. 806-813, July 2016. (ERA Tier **A\*** journal)
18. \***#C. T. Lin†**, **C. H. Chuang**, S. Kerick, T. Mullen, T. P. Jung, **L. W Ko**, **S. A. Chen**, **J. T. King**, and K. McDowell, "Mind-Wandering Tends to Occur under Low Perceptual Demands during Driving," *Scientific Reports*, Vol. 6, No. 21353, pp. 1-11, 2016. (**Nature Publishing Group**; 5-Year Impact Factor: 5.598, Rank: 5/57 or 8.8% in the category of MULTIDISCIPLINARY SCIENCES)
19. \***Y. T. Liu**, **Y. Y. Lin**, **S. L. Lin**, **C. H. Chuang**, and **C. T. Lin†**, "Brain Dynamics in Predicting Driving Fatigue Using a Recurrent Self-Evolving Fuzzy Neural Network," *IEEE Transactions on Neural Networks and Learning Systems*, Vol. 27, Issue 2, pp. 347-360, Feb. 2016. (ERA Tier **A\*** journal)
20. W. P. Ding, **C. T. Lin**, M. Prasad, and S. B. Chen, "Attribute Equilibrium Dominance Reduction Accelerator (DCCAEDR) Based on Distributed Coevolutionary Cloud and Its Application in Medical Records," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, Vol. 46, Issue 3, Mar. 2016. (ERA Tier **A** journal)

21. \*Y. Y. Lin, N. R. Pal, and **C. T. Lin**†, “An Interval Type-2 Neural Fuzzy System for Online System Identification and Feature Elimination,” *IEEE Transactions on Neural Networks and Learning Systems*, Vol. 26, No. 7, pp. 1442-1455, July 2015. (ERA Tier **A\*** journal)
22. \*#**C. T. Lin**, Y. K. Wang, S. A. Chen, and T. P. Jung, “EEG-Based Attention Tracking during Distracted Driving,” *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, Vol. 23, No. 6, pp. 1085-1094, Nov. 2015. (ERA Tier **A\*** journal)
23. \***C. T. Lin**, M. Prasad, and A. Saxena, "An Improved Polynomial Neural Network Classifier Using Real Coded Genetic Algorithm," *IEEE Transaction on System, Man and Cybernetics: System*, Vol. 45, Issue 11, pp. 1389-1401, Nov. 2015. (ERA Tier **A** journal)
24. \*#**C. T. Lin**, T. C. Chiu, and K. Gramann, "EEG Correlates of Spatial Orientation in the Human Retrosplenial Complex," *NeuroImage*, Vol. 120, pp. 123-132, Oct. 2015. (ERA Tier **A** journal)
25. \*C. S. Huang, N. R. Pal, C. H. Chuang, and **C. T. Lin**†, “Identifying Changes in EEG Information Transfer during Drowsy Driving by Transfer Entropy,” *Frontiers in Human Neuroscience*, Vol. 9, Oct. 23, 2015. (ERA Tier **A** journal)
26. \*M. Prasad, **C. T. Lin**, D. L. Li, C. T. Hong, W. Ding, and J. Y. Chang, “Soft-boosted Self-constructing Neural Fuzzy Inference Network,” accepted by *IEEE Transactions on Systems, Man and Cybernetics: Systems*, 2 Nov. 2015. (ERA Tier **A** journal)
27. \*#C. H. Chuang, L. W. Ko, Y. P. Lin, T. P. Jung, and **C. T. Lin**† “Independent Component Ensemble of EEG for Brain-Computer Interface,” *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, Vol. 22, Issue 2, pp. 230-238, March 2014. (ERA Tier **A\*** journal)
28. \*#C. H. Chuang, L. W. Ko, T. P. Jung, and **C. T. Lin**†, “Kinesthesia in a sustained-attention driving task,” *NeuroImage*, Vol. 91, pp. 187-202, May 2014. (ERA Tier **A** journal)
29. Y. Y. Lin, S. H. Liao, J. Y. Chang, and **C. T. Lin**†, “Simplified Interval Type-2 Fuzzy Neural Networks,” *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, Vol. 25, No. 5, pp. 85-93, May 2014. (ERA Tier **A\*** journal)
30. \*C. S. Huang, C. L. Lin, L. W. Ko, S. Y. Liu, T. P. Su, and **C. T. Lin**†, “Knowledge-based Identification of Sleep Stages Based on Two Forehead Electroencephalogram Channels,” *Frontiers in Neuroscience*, Vol. 8, Issue 263, doi:10.3389, Aug. 2014. (ERA Tier **A** journal)
31. Y. Y. Lin, J. Y. Chang, and **C. T. Lin**†, “Identification and Prediction of Dynamic Systems Using an Interactively Recurrent Self-evolving Fuzzy Neural Network (IRSFNN),” *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, Vol. 24, Issue 2, pp. 310–321, Feb. 2013. (ERA Tier **A\*** journal)
32. Y. Y. Lin, J. Y. Chang, N. R. Pal, and **C. T. Lin**†, “A Mutually Recurrent Interval Type-2 Neural Fuzzy System (MRIT2NFS) with Self-evolving Structure and Parameters,” *IEEE Transactions on Fuzzy Systems*, Vol. 21, Issue 3, June 2013. (ERA Tier **A\*** journal)
33. \*S. L. Wu, L. D. Liao, S. W. Lu, W. L. Jiang, S. A. Chen, and **C. T. Lin**†, “Controlling a Human-Computer Interface System with a Novel Classification Method that uses Electrooculography Signals,” *IEEE Transactions on Biomedical Engineering (TBME)*, Vol. 60, No. 8, pp. 2133-2141, Aug. 2013. (ERA Tier **A\*** journal)
34. \*#**C. T. Lin**†, K. C. Huang, C. H. Chuang, L. W. Ko, and T. P. Jung, “Can Arousing Feedback Rectify Lapses in Driving? Prediction from EEG Power Spectra,” *Journal of Neural Engineering*, Vol. 10, No. 5, Oct. 2013. (ERA Tier **A\*** journal)
35. \***C. T. Lin**, S. F. Tsai, and L. W. Ko, “EEG-Based Learning System for Online Motion Sickness Level Estimation in a Dynamic Vehicle Environment,” *IEEE Transactions on Neural Networks and Learning Systems*, Vol. 24, Issue 10, pp. 1689-1700, Oct. 2013. (ERA Tier **A\*** journal)
36. C. H. Li, B. C. Kuo, **C. T. Lin**, and C. S. Huang, “A Spatial-Contextual Support Vector Machine For Remotely Sensed Image Classification,” *IEEE Transactions on Geoscience and Remote Sensing*, Vol. 50, No. 3, pp. 784-799, Mar. 2012. (ERA Tier **A** journal)

37. \*#C. L. Lin, F. Z. Shaw, K. Y. Young, **C. T. Lin**, and T. P. Jung, "EEG Correlates of Haptic Feedback in a Visuomotor Tracking Task," *NeuroImage*, Vol.60, Issue 4, pp. 2258-2273, May 1. 2012. (ERA Tier **A** journal)
38. \*#S. W. Chuang, L. W. Ko, Y. P. Lin, R. S. Huang, T. P. Jung, and **C. T. Lin**†, "Co-modulatory Spectral Changes in Independent Brain Processes Are Correlated with Task Performance," *NeuroImage*, Vol.62 No.3, pp. 1469-1477, May 2012. (ERA Tier **A** journal)
39. #L. D. Liao, **C. T. Lin**\*†, K. McDowell, A. Wickenden, K. Gramann, T. P. Jung, L.W. Ko, and J. Y. \*Chang, "Biosensor Technologies for the Augmented Brain-Computer Interface in the Next Decades," *Proceedings of The IEEE*, Vol.100, pp. 1553-1566, May 2012. (ERA Tier **A\*** journal)
40. \*H. Y. Lai, L. D. Liao, **C. T. Lin**, J. H. Hsu, Xin He, Y. Y. Chen, J.Y. Chang, H. F. Chen, S. Tsang, and Y. Y. I Shih, "Design, Simulation and Experimental Validations of a Novel Flexible Neural Probe for Deep Brain Stimulation and Multichannel Recording," *Journal of Neural Engineering*, Vol. 9, No. 3, June 2012. (ERA Tier **A\*** journal)
41. \*F. C. Lin, L. W. Ko, C. H. Chuang, T. P. Su, and **C. T. Lin**, "Generalized EEG-based Drowsiness Prediction System by Using a Self-Organizing Neural Fuzzy System," *IEEE Transactions on Circuits and Systems I-Regular Papers*, Vol. 59, No. 9, pp. 2044-2055, Sep. 2012. (ERA Tier **A** journal)
42. P. Y. Chen, L. D. Van, I. H. Khoo, H.C. Reddy, and **C. T. Lin**, "Power-efficient and Cost-effective 2-D Symmetry Filter Architectures," *IEEE Transactions on Circuits and Systems I-Regular Papers*, Vol. 58, No. 1, pp. 112-125, Jan. 2011. (ERA Tier **A** journal)
43. C. H. Li, B.C. Kuo, and **C. T. Lin**, "LDA-Based Clustering Algorithm and Its Application to An Unsupervised Feature Extraction," *IEEE Transactions on Fuzzy Systems*, Vol.19, No.1, pp.152-163, Feb. 2011. (ERA Tier **A\*** journal)
44. \***C. T. Lin**†, L. D. Liao, Y. H. Liu, I. J. Wang, B. S. Lin, and J. Y. Chang, "Novel Dry Polymer Foam Electrodes for Long-Term EEG Measurement," *IEEE Transactions on Biomedical Engineering*, Vol.58, No.5, pp. 1200-1207, May 2011. (ERA Tier **A\*** journal)
45. \*#Y. C. Chen, J. R. Duann, S. W. Chuang, C. L. Lin, L. W. Ko, T. P. Jung, and **C. T. Lin**†, "Spatial and Temporal EEG Dynamics of Motion Sickness," *NeuroImage*, Vol. 49, No. 3, pp. 2862-2870, Feb. 2010. (ERA Tier **A** journal)
46. \***C. T. Lin**†, K. C. Chang, C. L. Lin, C. C. Chiang, S. W. Lu, S. S. Chang, B. S. Lin, H. Y. Liang, R. J. Chen, Y. T. Lee, and L. W. Ko, "An Intelligent Telecardiology System Using a Wearable and Wireless ECG to Detect Atrial Fibrillation," *IEEE Transactions on Information Technology in Biomedicine*, Vol. 14, No. 3, pp. 726-733, May 2010. (ERA Tier **A\*** journal)
47. \*#**C. T. Lin**†, K. C. Huang, C. F. Chao, J. A. Chen, T. W. Chiu, L. W. Ko, and T. P. Jung, "Tonic and Phasic EEG and Behavioral Changes Induced by Arousing Feedback," *NeuroImage*, Vol. 52, Issue 2, pp. 633-642, Aug. 2010. (ERA Tier **A** journal)
48. L. D. Liao, M. L. Li, H. Y. Lai, Y. Y. Shih, Y. C. Lo, S. Tsang, Paul C.P. Chao, **C. T. Lin**, F. S. Jaw, and Y. Y. Chen, "Imaging Brain Hemodynamic Changes During Rat Forepaw Electrical Stimulation Using Functional Photoacoustic Microscopy," *NeuroImage*, Vol. 52, No. 2, pp. 562-570, Aug. 2010. (ERA Tier **A** journal)
49. C. H. Chen, C. J. Lin, and **C. T. Lin**†, "Using an Efficient Immune Symbiotic Evolution Learning for Compensatory Neuro-fuzzy Controller," *IEEE Transactions on Fuzzy Systems*, Vol. 17, No. 3, pp. 668-682, June 2009. (ERA Tier **A\*** journal)
50. \***C. T. Lin**†, Y. C. Chen, T. Y. Huang, T. T. Chiu, L. W. Ko, S. F. Liang, H. Y. Hsieh, S. H. Hsu, and J. R. Duann, "Development of Wireless Brain Computer Interface with Embedded Multi-task Scheduling and its Application on Real-time Driver's Drowsiness Detection and Warning," *IEEE Transactions on Biomedical Engineering*, Vol. 55, No. 5, pp.1582-1591, May 2008. (ERA Tier **A\*** journal)

51. \*#**C. T. Lin**†, **L. W. Ko**, J. C. Chiou, J. R. Duann, R. S. Huang, T. W. Chiu, **S. F. Liang**, and T. P. Jung, "Noninvasive Neural Prostheses Using Mobile and Wireless EEG," *Proceedings of the IEEE*, Vol. 96, No.7, pp. 1167-1183, July 2008. (ERA Tier **A**\* journal)
52. **C. T. Lin**†, Y. C. Yu, and L. D. Van, "Cost-effective Triple-mode Reconfigurable Pipeline FFT/IFFT/2-D DCT Processor," *IEEE Transactions on Very Large Scale Integration (VLSI) Systems*, Vol. 16, No. 8, pp. 1058-1071, Aug. 2008. (ERA Tier **A** journal)
53. \***S. F. Liang**, S. M. Lu, J. Y. Chang, and **C. T. Lin**†, "A Novel Two-stage Impulse Noise Removal Technique Based on Neural Networks and Fuzzy Decision," *IEEE Transactions on Fuzzy Systems*, Vol. 16, No. 4, pp. 863-873, Aug. 2008. (ERA Tier **A**\* journal)
54. C. H. Chen, **C. J. Lin**, and **C. T. Lin**†, "A Functional-link-based NeuroFuzzy Network for Nonlinear System Control," *IEEE Transactions on Fuzzy Systems*, Vol. 16, No. 5, pp. 1362-1378, Oct. 2008. (ERA Tier **A**\* journal)
55. **C. T. Lin**†, H. C. Pu, K. W. Fan, S. M. Lu, and **S. F. Liang**, "An HVS-directed Neural-network-based Image Resolution Enhancement Scheme for Image Resizing," *IEEE Transactions on Fuzzy Systems*, Vol.15, No. 4, pp.605-615, Aug. 2007. (ERA Tier **A**\* journal)
56. **C. H. Huang** and **C. T. Lin**†, "Bio-inspired Computer Fovea Model Based on Hexagonal-type Cellular Neural Network," *IEEE Transactions on Circuits and Systems I-Regular Papers*, Vol. 54, No. 1, pp. 35-47, Jan. 2007. (ERA Tier **A** journal)
57. \***C. T. Lin**†, **I. F. Chung**, **L. W. Ko**, **Y. C. Chen**, **S. F. Liang**, and J. R. Duann, "EEG-based Assessment of Driver Cognitive Responses in a Dynamic Virtual-reality Driving Environment," *IEEE Transactions on Biomedical Engineering*, Vol. 54, Issue 7, pp. 1349-1352, July 2007. (ERA Tier **A**\* journal)
58. **C. T. Lin**†, **C. H. Huang**, and **S. A. Chen**, "CNN-based Hybrid-order Texture Segregation as Early Vision Processing and its Implementation on CNN-UM," *IEEE Transactions on Circuits and Systems I-Regular Papers*, Vol. 54, No.10, pp. 2277-2287, Oct. 2007. (ERA Tier **A** journal)
59. **C. T. Lin**†, C. M. Yeh, **S. F. Liang**, J. F. Chung, and Nimit Kumar, "Support-vector-based Fuzzy Neural Network for Pattern Classification," *IEEE Transactions on Fuzzy Systems*, Vol. 14, No. 1, pp. 31-41, Feb. 2006. (ERA Tier **A**\* journal)
60. \*#**C. T. Lin**†, **L. W. Ko**, **I. F. Chung**, T. Y. Huang, **Y. C. Chen**, T. P. Jung, and **S. F. Liang**, "Adaptive EEG-based Alertness Estimation System by Using ICA-Based Fuzzy Neural Networks," *IEEE Transactions on Circuits and Systems I-Regular Papers*, Vol. 53, No. 11, pp. 2469-2476, Nov. 2006. (ERA Tier **A** journal)
61. \***C. T. Lin**†, W. C. Cheng, and **S. F. Liang**, "An On-line ICA-mixture-model-based Self-constructing Fuzzy Neural Network," *IEEE Transactions on Circuits and Systems I-Regular Papers*, Vol. 52, No. 1, pp. 207-221, Jan. 2005. (ERA Tier **A** journal)
62. \***C. T. Lin**†, W. C. Cheng, and **S. F. Liang**, "A 3-D Surface Reconstruction Approach Based on Postnonlinear ICA Model," *IEEE Transactions on Neural Networks*, Vol. 16, No. 6, pp. 1638-1650, Nov. 2005. (ERA Tier **A**\* journal)
63. **C. T. Lin**†, W. C. Cheng, and **S. F. Liang**, "Neural-network-based Adaptive Hybrid-reflectance Model for 3-D Surface Reconstruction," *IEEE Transactions on Neural Networks*, Vol. 16, No. 6, pp. 1601-1615, Nov. 2005. (ERA Tier **A**\* journal)
64. \*#**C. T. Lin**†, R. C. Wu, **S. F. Liang**, W. H. Chao, Y. J. Chen, and T. P. Jung, "EEG-based Drowsiness Estimation for Safety Driving Using Independent Component Analysis," *IEEE Transactions on Circuits and Systems I-Regular Papers*, Vol. 52, No. 12, pp. 2726-2738, Dec. 2005. (ERA Tier **A** journal)
65. **F. B. Duh**, **C. F. Juang**, and **C. T. Lin**†, "A Neural Fuzzy Network Approach to Radar Pulse Compression," *IEEE Transactions on Geoscience and Remote Sensing*, Vol. 1, No. 1, pp. 15-20, Jan. 2004. (ERA Tier **A** journal)

66. F. B. Duh and C. T. Lin†, "Tracking a Maneuvering Target Using Neural Fuzzy Network," *IEEE Transactions on Systems Man and Cybernetics Part B-Cybernetics*, Vol. 34, No. 1, pp. 16-33, Feb. 2004. (ERA Tier **A** journal)
67. C. T. Lin†, R. C. Wu, J. Y. Chang, and S. F. Liang, "A Novel Prosodic- information Synthesizer Based on Recurrent Fuzzy Neural Network for the Chinese TTS System," *IEEE Transactions on Systems Man and Cybernetics Part B-Cybernetics*, Vol. 34, pp. 309-324, Feb. 2004. (ERA Tier **A** journal)
68. C. T. Lin†, C. L. Chang, and W. C. Cheng, "A Recurrent Fuzzy Cellular Neural Network System with Automatic Structure and Template Learning," *IEEE Transactions on Circuits and Systems I-Regular Papers*, Vol. 51, No. 5, pp.1024-1035, May 2004. (ERA Tier **A** journal)
69. Y. W. Shou and C. T. Lin†, "Image Descreening by GA-CNN-based Texture Classification," *IEEE Transactions on Circuits and Systems I-Regular Papers*, Vol. 51, pp. 2287- 2299, Nov. 2004. (ERA Tier **A** journal)
70. \*G. D. Wu and C. T. Lin†, "Single-channel Speech Enhancement in Variable Noise-level Environment," *IEEE Transactions on Systems Man and Cybernetics Part B-Cybernetics*, Vol. 33, No.1, pp. 137-143, Jan. 2003. (ERA Tier **A** journal)
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119. D. Wu, V. Lawhern, S. Gordon, B. Lance, and **C. T. Lin**, "Spectral Meta-Learner for Regression Model Aggregation: Towards Calibrationless Offline BCI," *IEEE International Conference on Systems, Man and Cybernetics* 2016.
120. C. S. Wei, Y. P. Lin, Y. T. Wang, **C. T. Lin**, and T. P. Jung\*, "Transfer Learning with Large-Scale Data in Brain-Computer Interfaces," *38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society* 2016.
121. F. Wang, Y. B. He, J. Qu, Q. Y. Xie, Q. Lin, X. X. Ni, Y. Chen, R. H. Yu, **C. T. Lin**, and Y. Q. Li, "An Audiovisual BCI System for Assisting Clinical Communication Assessment in Patients with Disorders of Consciousness: A Case Study," *38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society* 2016.
122. M. Nascimben\*, J. T. King, and **C. T. Lin**, "Resting Upper Alpha Can Predict Motor Imagery Performance?" *38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society* 2016.
123. C. L. Chang, C. S. Huang, S. W. Lu, and **C. T. Lin**, "Apply Artifact Rejection on Multi-Channel Dry EEG System under Motion," *Neuroscienc 2016: The 39th Annual Meeting of the Japan Neuroscience Society* 2016.
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128. L. W. Ko, B. J. Yang, S. K. R. Singanamalla, J. T. King, **C. T. Lin**, and T. P. Jung, "A Practical Neurogaming Design Based on SSVEP Brain Computer Interface," *18th International Conference on Human-Computer Interactional (HCI International)* 2016.
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132. A. Liu, G. Zhang, J. Lu, N. Lu, F. Dong, and **C. T. Lin**, "An Online Competence-based Concept Drift Detection Algorithm," submitted to *IEEE International Joint Conference on Neural Networks* 2016. (ERA Ranking **A**)

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135. Z. H. Cao, L. W. Ko, K. L. Lai, S. B. Huang, S. J. Wang, and C. T. Lin† "Classification of Migraine Stages based on Resting-State EEG Power," *IJCNN 2015: The International Joint Conference on Neural Networks*, Killarney, Ireland, July.12-17, 2015. (ERA Ranking **A**)
136. L. W. Ko, W. K. Lai, W. G. Liang, C. H. Chuang, S. W. Lu, Y. C. Lu, T. Y. Hsiung, H. H. Wu, and C. T. Lin†, "Single Channel Wireless EEG Device for Real-Time Fatigue Level Detection," *IJCNN 2015: International Joint Conference on Neural Networks*, Killarney, Ireland, July. 12-17, 2015. (ERA Ranking **A**)
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147. S. Y. Li, L. M. Tam, H. K. Chen, S. K. Lao, L. W. Ko, and C. T. Lin†, "System Modelling and Synchronization of Nonlinear Chaotic Systems with Uncertainty and Disturbance," *The 2013 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2013)*, India, July 7-10, 2013. (ERA Ranking **A**)

148. C. S. Huang, C. L. Lin, W. Y. Yang, L. W. Ko, S. Y. Liu and **C. T. Lin**†, “Applying the Fuzzy C-means based Dimension Reduction to Improve the Sleep Classification System,” *The 2013 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2013)*, India, July 7-10, 2013. (ERA Ranking **A**)

149. S. Y. Li, W. J. Tang, T. C. Chiu, L. W. Ko, **C. T. Lin**, and K. Gramann, “Brain Dynamics of Detour-Planning in Egocentric and Allocentric Navigators,” *6th International IEEE EMBS Conference on Neural Engineering*, San Diego, USA, Nov. 14, 2013. (ERA Ranking **A**)

#### D. Patens (selected)

Title	Country	Patent No.	Owner	Period
Gain Estimation Scheme for LPC Vocoders with a Shape Index Based on Signal Envelopes	USA	US5953697	Ho-Tech Semi-Conduct Co.	1998~
Gain Estimation Scheme for LPC Vocoders	Taiwan	092899	Ho-Tech Semi-Conduct Co	1998/02/01~ 2016/12/18
Gain Estimation Scheme for LPC Vocoders	China	CN 1190773 A	Ho-Tech Semi-Conduct Co	1998/08/19~
Voice/Unvoice Estimation Scheme for LPC Vocoders	Taiwan	109343	Shen-Chi Semi-Conduct Co	1999/11/01~ 2016/12/18
Voice/Unvoice Estimation Scheme for LPC Vocoders	China	CN 1189664 A	Ho-Tech Semi-Conduct Co	1998/08/08~
Method for Image Resolution Enhancement	USA	US 7187811 B2	Chi-Hang Inc.	2003/03/18~ 2025/03/04
Bio-Sensing Technology and Devices	Taiwan	I236533	Taiwan Biotech Inc.	2005/07/21~ 2023/11/06
Palm type electrocardiograph	USA	US 200802494 26 A1	Chiajei Biotech Inc.	2008/10/09~
	Taiwan	M323886		2007/12/21~ 2017/03/13
	China	CN 201005694 Y		2008/01/16~
Evolution-based Smart Agent Method	Taiwan	I309023	NCTU	2009/04/21~ 2026/03/16
Spatial-temporal Fuzzy Reasoning Method for Gesture Recognition	Taiwan	I322963	NCTU	2010/04/01~ 2027/01/18
Automatic Bio-signal Supervising System for Medical Care	USA	US2009025 9138 A1	NCTU	2009/10/15
Fish-eye Image Calibration Method	Taiwan	I339361	CT Lin	2011/3/21~ 2027/03/12
	China	CN 101072288 A	CT Lin	2007/11/14
Moving Object Tracking Method	China	CN198038 4 A	CT Lin	2006/09/27~
Dynamic Image Background Extraction Method	Taiwan	I363316	CT Lin	2012/05/01~ 2028/03/27
	China	CN 101290661 B	CT Lin	2010/09/22~

Dry Electrode for Measuring Bio-Medical Signals	Taiwan	I392479	NCTU	2013/04/11~ 2030/08/19
	USA	US 8,406,841 B2		2013/03/26~ 2031/11/17
Biomedical Sensor	Taiwan	I373324	NCTU	2012/10/01~ 2029/05/04
Biomedical Sensor Device	USA	US 8,543,179 B2		2009/06/08~ 2032/06/20
General Digital Image Stabilization Method	Taiwan	I307443	NCTU	2009/03/01~ 2025/11/22
CMOS Photo-Diode for Portable Biosensing Device	Taiwan USA	Approved	NCTU	2005/07/21~ 2023/11/06
An Bio-Perceive and Interaction Device and Method Thereof	Taiwan	I517834	NCTU	2016/01/21~ 2030/09/09
Interactive Biosensing Device and Method	USA	Pending		
Interactive Biosensing Device and Method	Japan	2012-55679		
Tactile Remote Control System	Taiwan	I400637	NCTU	2013/07/01~ 2029/09/10
Tactile Remote Control System	USA	US 201100630 73 A1		2011/03/17~
Exercise-based Health-examination Device and Platform	Taiwan	M409866	CT Lin	2011/08/21~ 2020/12/30
Intelligent User Interface for Biking Exercise Device	Taiwan	M409867	CT Lin	2011/08/21~ 2020/12/30
Physiological Signal Detecting Glove	Taiwan	M409818	CT Lin	2011/08/21~ 2020/12/30
Sensory-network for Physiological and Environmental Signals	Taiwan	I418334	NCTU	2013/12/11~ 2030/09/27
Human Identification and Tracking Devices	Taiwan	M420786	CT Lin	2012/01/11~ 2021/03/10
	China	CN2020581 72U		2011/11/30
Image-based Smoke Sensing Method	Taiwan	M420681	CT Lin	2012/01/11~ 2021/02/24
	China	CN2020582 66U		2011/11/30
Human Identification and Warning Devices	Taiwan	M420787	CT Lin	2012/01/11~ 2021/03/10
	China	CN2020581 73U		2011/11/30
Obstacle Detection Device for Vehicles	Taiwan	M433988	CT Lin	2012/07/21~ 2021/08/01
Face Recognition Device	Taiwan	M432892	CT Lin	2012/07/01~ 2021/07/28
Human Detection Device	Taiwan	M432873	CT Lin	2012/07/01~ 2021/07/28
Vehicle Detection Device	Taiwan	M423067	CT Lin	2012/02/21~ 2021/07/28
Incident Detection Method	Taiwan	M391805	CT Lin	2010/11/01~ 2020/04/08

Embedded Software Protection Method	Taiwan	I384382	CT Lin	2013/02/01~ 2029/02/12
Virtual Detection Chain or Image-based Security Monitoring	Taiwan	M435114	V5 TECHNOLOGY CO., LTD.	2012/08/01~ 2022/02/09
	USA	pending	V5 TECHNOLOGY CO., LTD.	
	China	CN 102867384 A	CT Lin	2013/01/09~
Smart Low-Carbon Monitoring, Report, and Verification Device	Taiwan	M441890	V5 TECHNOLOGY CO., LTD.	2012/11/21~ 2021/10/27
Line-Junction Dry Electrode	Taiwan	I547263	NCTU	2016/09/01~ 2033/03/21
Line-junction Dry Electrode	Taiwan	M457530	CT Lin	2013/7/21 ~ 2023/3/21
Line-Contact Dry Electrode	USA	US 9186084 B2	CT Lin	2013/06/14 ~ 2034/01/02
		US 9295400 B2		2013/06/14 ~ 2033/06/14
		US 9314184 B2		2013/06/14 ~ 2033/06/14
		US 9314185 B2		2013/06/14 ~ 2033/06/14
Biomedical Electric Wave Sensor	USA	US 8,285,355 B2	NCTU	2012/10/9 ~ 2031/2/7
Dry Electrode for Biomedical Signal Measuring Sensor	USA	US 8,406,841 B2	NCTU	2013/03/26~
Multi-function Homecare Device	China	CN2020962 22U	CT Lin	2012/01/04
Biomedical Electric Wave Sensor	Taiwan	I383779	NCTU	2013/02/01~ 2029/12/17
Biomedical Sensor	Taiwan	I373324	NCTU	2012/10/01~ 2029/05/04
Brainwave Control of Message Chair	Taiwan	M437719	CT Lin	2012/09/21~ 2022/03/12
VR-based Biking Touring System	Taiwan	M437737	CT Lin	2012/09/21~ 2022/01/12
Vision-based Traffic Flow Detection Method	Taiwan	M419093	CT Lin	2011/12/21~ 2021/06/30
Smart Car-Moving Recording System	Taiwan	M402418	CT Lin	2011/04/21~ 2020/09/27
Image Resolution Enhancement Method	Taiwan	198424	Advanced & Wise Technology Corp.	2004/03/01~ 2022/10/24
Embedded DSP System for Spectrum Analysis	China	CN 101369999 A	ELAN MICROELECTRONIC S CPRP.	2009/02/18
Wireless Brainwave Sensing Device	Taiwan	M448988	Touch-Mind Co. LTD	2013/03/21~ 2022/11/12
Electrode-Replaceable Brain Hat	Taiwan	M448987	Touch-Mind Co. LTD	2013/03/21~ 2022/11/12
Obstacle Detection Method in Night	Taiwan	M451611	Chung Shan Institute of Science and Technology,	2013/04/21~20 22/11/25

Smart Monitoring of Illumination System	Taiwan	M455946	V5 Technology Co., LTD	2013/06/21~2020/09/20
Smart Security System	Taiwan	M455927	V5 Technology Co., LTD	2013/06/21~2022/09/20
Smart Emergency Communication Pole	Taiwan	D160574	NCTU Farglory Group	2014/05/11~2025/05/23
Multifunction Road-side Security Service Station	Taiwan	M473657	NCTU Farglory Group	2014/03/01~2023/05/23
Integrated Intelligent Low Carbon Monitoring and Evaluation System	Taiwan	I502197	CT Lin CR Lin	2015/10/01~2031/01/27
Device of Drowsiness Detection and Alarm and Method of the Same	Taiwan	accept	NCTU	2016/10/26 accepted
Visual Line Detection Device and Method for the Same	Taiwan	accept	NCTU	2016/10/26 accepted
Device for Suppressing Noise of Brainwave and Method for the Same	Taiwan	accepted	NCTU	2016/10/26 accepted
Identification Module	Taiwan	M491214	CTLin	2014/12/01~2024/03/06
Image Controlling System for Detecting Electrooculography (EOG)	Taiwan	I466655	NCTU	2015/01/01~2032/03/15
Biosensor and Electrode Structure Thereof	Taiwan	I481383	NCTU	2015/04/21~2029/09/24
An Interactive Method of Bio-Perceive and Interactive Device	Taiwan	I517834	NCTU	2016/01/21~2030/09/09
Dynamic Event-Related Causality Method by Transfer Entropy	Taiwan	I534724	NCTU	2016/05/21~2035/08/17
Method for Instantly Removing Artifacts of Electroencephalogram	Taiwan	I538661	NCTU	2016/06/21~2035/08/17
Calculation Method of Learning Migration	Taiwan	I539388	NCTU	2016/06/21~2035/08/17
Event Identification Methods	Taiwan	pending	NCTU	2016/07/25 accepted
Inflatable Electroencephalogram Measuring Device	Taiwan	TW2016187 12A	Brain Rhythm Inc.	2016/06/01
METHOD OF GENERATED SAMPLING FORM UTILIZING KERNEL SUBSPACE	Taiwan	I550416	NCTU	2016/09/21~2035/08/17
A Method of Generated Sampling Form Utilizing Subspace	Taiwan	pending	NCTU	2016/07/25 accepted
AN ASSEMBLY AND DRY ELECTRODE SENSOR FOR THE MEASUREMENT OF CREATURE SIGNALS USING	Taiwan	I552720	NCTU	2016/10/11~2035/06/07
BRAINWAVE-CONTROLLED SLEEPING ENVIRONMENT ASSISTANCE SYSTEM AND METHOD THEREOF	Taiwan	I551309	NCTU	2016/10/01~2035/08/17
Bio-Signal Sensor	Taiwan	I552721	NCTU	2016/10/11~2035/10/20
Sensor Apparatus	Taiwan	I552724	NCTU	2016/10/11~2035/10/20
Thin Planar Biological Sensor	Taiwan	201632142	NCTU	2016/09/16

## E. Research Support

I have served as the Chief Investigator (CI) of about **277** research projects funded by government and industries between 1992 and 2016. The total amount of research funding is approximately **US\$41,495K**

**(AUD\$51,868K).** In particular, I served as the CI of several international large-scale research projects on intelligent systems, natural cognition, and brain-computer interface, spanning several countries and industries:

- a. **Cognition and Neuroergonomics (CAN) Collaborative Technology Alliance (CTA), funded by US Army Research Lab, 2010 – 2020, amount: US\$ 7.5 million (my share).** This project consists of three research topics: Neurocognition, Neurocomputation, and Neurotechnology. I am the CI for the topic of Neurotechnology, studying the *Effects of Vehicle Motion and Cognitive Fatigue*, and *Wearable EEG Devices Development and Testing*. This is the first time that the US ARL has supported a Taiwanese organization on large scale, and it is one of the major projects in Neuroscience and Engineering Research in the US.
- b. **International Center of Excellence for Advanced Bioengineering Research, funded by Taiwan NSC (National Science Council), 2011 – 2015, amount: US\$ 6.65 million.** This Center conducts interdisciplinary research in Neural Engineering, Translation Neuroscience, and Healthcare. The goals are to enhance our understanding of human perception and cognition, to create and apply innovative technology to advance neuroscience research, and to develop novel methods and strategies for improving the prevention, diagnosis, and treatment of neurological diseases and injuries. In this project, I focus on two research topics: Computational Neuroscience and Bio-sensing Technology.
- c. **Development of Smart Living Technologies, funded by Taiwan NSC and Farglory Construction Company, 2008 – 2015, amount: US\$ 8.2 million.** This project has developed smart living technologies and service models, including *i-Home* (smart home technology), *i-Service* (smart services platform), *i-Sensing* (environment monitoring), *i-Care* (home care), *i-Traffic* (intelligent traffic systems), and *i-Light* (smart energy management), to meet users' needs and real-life experiences through testing in living labs. The project was awarded the **LLG Award 2011** with the citation "Innovation and Excellence for smart Urban Technologies." The LLG (Living Labs Global) is an NGO started in 2003, connecting 52 countries, 127 cities, and more than 160 organizations/companies, as a platform for service innovation (more than 500 showcases).