**Special Session Proposal for ICONIP 2017**

**Organizer**: Dongrui Wu

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**Title:** Signal processing and machine learning for brain computer interfaces (BCIs)

**Description of the special session:**

Novel application of BCI require advances in signal processing and machine learning in order to provide robustness and reliability in real-life applications. This session will discuss state-of-the-art methods in this direction. Scope and topics of interest include, but are not limited to:

* Signal processing for BCI, e.g., ICA, CSP, CCA, etc.
* Machine learning for BCI, e.g., deep learning, transfer learning, ensemble learning, reinforcement learning, etc.
* Recent advances, e.g., Riemannian geometry for EEG feature extraction.
* Invasive and non-invasive BCIs.
* Online and offline BCI applications.

**Potential Contributors:**

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**Biography:**

**Dongrui Wu** received a B.E in Automatic Control from the University of Science and Technology of China in 2003, an M.Eng in Electrical and Computer Engineering from the National University of Singapore in 2005, and a PhD in Electrical Engineering from the University of Southern California (USC) in 2009. He was a Research Associate in the USC Institute for Creative Technologies and Signal Analysis and Interpretation Laboratory, and a Lead Research Engineer in the Machine Learning Lab, GE Global Research, Niskayuna, NY. He is now a Professor in the School of Automation, Huazhong University of Science and Technology, Wuhan, Hubei, China.

Dongrui Wu's research interests include affective computing, brain-computer interface, computational intelligence, and machine learning. Dongrui Wu has over 90 publications, including a book “*Perceptual Computing*” (with J.M. Mendel, Wiley-IEEE, 2010). He received IEEE International Conference on Fuzzy Systems Best Student Paper Award in 2005, IEEE Computational Intelligence Society (CIS) Outstanding PhD Dissertation Award in 2012, IEEE Transactions on Fuzzy Systems Outstanding Paper Award in 2014, and North American Fuzzy Information Processing Society (NAFIPS) Early Career Award in 2014. He was a finalist of IEEE Transactions on Affective Computing Most Influential Paper Award in 2015, and IEEE Brain Initiative Best Paper Award in 2016. He was a selected participant of the National Academy of Engineering German-American Frontiers of Engineering Symposium in 2015, and the 13th Annual National Academies Keck Futures Initiative (NAKFI) conference in 2015. Dongrui Wu was selected into the China 1000-talnet plan youth program in 2016.

Dongrui Wu had worked on a broad range of projects from GE Capital, Healthcare, Transportation, Power and Water, and Oil and Gas. Two of his projects won the prestigious CIO 100 Awards in 2012 (TrueSense for GE Water) and 2014 (Fleet Optimizer for GE Capital), respectively. Additionally, he received 10 Above and Beyond Awards from GE for outstanding performance. He has three issued US patents, and several pending.

Dongrui Wu is an Associate Editor of the *IEEE Transactions on Fuzzy Systems* (2011-), the *IEEE Transactions on Human-Machine Systems* (2014-), and the *IEEE Computational Intelligence Magazine* (2017-). He was the lead Guest Editor of the *IEEE Computational Intelligence Magazine* Special Issue on Computational Intelligence and Affective Computing in 2013, and the lead Guest Editor of the *IEEE Transactions on Fuzzy Systems* Special Issue on Brain Computer Interface in 2017. He is a Senior Member of IEEE, an Executive Committee member of the Association for the Advancement of Affective Computing (AAAC), a Board member and distinguished lecturer of the NAFIPS, and a member of IEEE Systems, Man and Cybernetics Society Brain-Machine Interface Systems Technical Committee, IEEE CIS Fuzzy Systems Technical Committee, Emergent Technologies Technical Committee, and Intelligent Systems Applications Technical Committee. He has been Chair/Vice Chair of the IEEE CIS Affective Computing Task Force since 2012.