Tianben Ding

One Brookings Drive, Campus Box 1042, St. Louis, MO 63130, tding@wustl.edu, 314.935.9070

Education

Ph.D. in Electrical Engineering, 2014 - present

Washington University in St. Louis, St. Louis, MO
Research Advisor: Professor Matthew D. Lew

M. Eng. in Electrical Engineering and Information Systems, 2012 - 2014

The University of Tokyo, Bunkyo, Tokyo, Japan
Research Advisor: Professor Akira Hirose
Thesis Title: "Fading channel prediction based on complex-valued neural networks"

B. Eng. with Honor in Physics, 2008- 2012

Yokohama National University, Yokohama, Kanagawa, Japan
Research Advisor: Professor Shingo Ishiwata
Thesis Title: "Pattern detection on CCD images using stochastic resonance"

Awards

Award of Excellence (to high achiever in the College of Engineering) 2012
Trustee and Vice-president, Yokohama National University

Award of Excellence (to top 3 students in the Division of Physics) 2012
Physics Alumni Association, Yokohama National University

Excellent Poster Award of Student Project Contest 2010
Division of Physics, Faculty of Engineering, Yokohama National University

Research Experience

Graduate Researcher 2015 - present
Lew Lab, Washington University in St. Louis, St. Louis, MO

Graduate Researcher 2012 - 2014
Hirose Lab, The University of Tokyo, Bunkyo, Tokyo, Japan

Fading channel prediction based on using complex-valued neural networks. Designed a new channel prediction method by focusing on rotational change of fading channel in the complex plain. Also developed the method by introducing a concept of sparse representation.

Undergraduate Researcher 2011 -2012
Ishiwata Lab, Yokohama National University, Yokohama, Kanagawa, Japan

Applied stochastic resonance to imaging to detect signal pattens with lower signal strength than sensor noise level.

Junior Special Project 2010 -2011
Division of Physics, Faculty of Engineering, Yokohama National University, Yokohama, Kanagawa, Japan

Simulated and evaluated the performance of a image noise reduction technique based on the Ising model.

Student Project Contest 2010
Division of Physics, Faculty of Engineering, Yokohama National University, Yokohama, Kanagawa, Japan

Time reversal acoustics and a separation of multi-source sound. Proposed a new method of multi-source sounds separation based on the time reversal acoustics.

Teaching Experience

Grader 2015
Washington University in St. Louis, St. Louis, MO

Served as a grader for "Fundamentals and applications of modern optical imaging" course. Assisted Professor Matthew D. Lew to build optical demonstrations, gave an example presentation, and graded homework.

Teaching Assistant 2012 - 2013
The University of Tokyo, Bunkyo, Tokyo, Japan

Served as a teaching assistant for "Experiments and exercises for electrical, electronic, and information II" and "Electrical and electronic measurement" courses. Leading undergraduate students to understand and complete experiments related to wireless electronics: design of microstrip lines and antennas, measurement on vector network analyzer and in radio wave darkroom. Also graded homework.

Professional Experience

Observer of 87th Technical Committee on Electromagnetic Theory 2013
Mitsuzawa, Aomori, Japan

Program Assistant, Asia-Pacific Conference on Synthetic Aperture Radar 2013 2013
Tsukuba, Tsukuba, Japan

Qualifications

Japanese-Language Proficiency Test: N1 level Score 180/180 2014

Publications

Journal Publications

1. **T. Ding** and A. Hirose, "Fading channel prediction based on combination of complex-valued neural networks and chirp z-transform," *IEEE Trans. Neural Netw. Learn. Syst.*, **25**, 9, 1686-1695, (2014).

Conference Papers

3. T. Murata, **T. Ding** and A. Hirose, "Proposal of channel prediction by complex-valued neural networks that deals with polarization as a transverse wave entity," *Neural Inf. Process. - 22st Int. Conf., ICONIP 2015, Istanbul, Turkey, Nov. 9-12, 2015. Proc. Part III*, **9491**, 541-549, (2015)

2. **T. Ding** and A. Hirose, "Fading channel prediction based on self-optimizing neural networks," *Neural Inf. Process. - 21st Int. Conf., ICONIP 2014, Kuching, Malaysia, Nov. 3-6, 2014. Proc. Part I*, **8834**, 175-182, (2014)

1. **T. Ding** and A. Hirose, "Fading channel prediction based on complex-valued neural networks in frequency domain," *Proc. of 2013 URSI Int. Symp. on Electromagnet. Theory (EMTS)*, 640-643, (2013).

Other Publications
* invited

3.* A. Hirose and **T. Ding**, "Neural networks to deal with complex amplitude and its strength in electronics," *C - Abstracts of IEICE Trans. Electron. (Japanese Edition)*, **J98-C**, 10, 184-192, (2015).

2. T. Murata, **T. Ding** and A. Hirose, "Polarization combination using complex-valued neural networks in channel prediction [in Japanese]," *IEICE tech. rep.*, **115**, 83, 31-35, (2015).

1 **T. Ding** and A. Hirose, "Sparsity of complex-valued neural networks in fading channel prediction [in Japanese]," *IEICE tech. rep. Neurocomputing*, **113**, 500, 103-108, (2014).

Oral Presentations

3. "Sparsity of complex-valued neural networks in fading channel prediction," *Tech. Cmte. on Neurocomputing*, Tokyo, Japan, Mar. 2014.

2. "Fading channel prediction based on path separation in Doppler spectrum and complex-valued neural-network processing," *42th Electromagnet. Theory*, Aomori, Japan, Nov. 2013.

1. "Fading channel prediction based on complex-valued neural networks in frequency domain," *Int. Symp. on Electromagnet. Theory (EMTS) 2013 (URSI commission B)*, Hiroshima, Japan, May. 2013.