

CURRICULUM VITAE

Zhiyao DUAN

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Information

Address Ford Engineering Design Center, Room 3-230, Northwestern University, 2133 Sheridan Road, Evanston, IL 60208, USA.

Homepage <http://www.cs.northwestern.edu/~zdu459/>

Research Interests Audio signal processing, Music information retrieval, Machine learning

Education

Aug. 2008 - Jun. 2013 Northwestern University - Evanston, IL, USA
(Expected) **PhD candidate** in Department of Electrical Engineering and Computer Science
Concentration: Audio signal processing, Machine learning
Advisor: Bryan Pardo (pardo <at> northwestern [dot] edu)

Sep. 2004 - Jul. 2008 Tsinghua University - Beijing, China
Master of Science in Department of Automation
Concentration: Audio information retrieval
Advisor: Changshui Zhang (zcs <at> tsinghua [dot] edu [dot] cn)

Sep. 2000 - Jul. 2004 Tsinghua University - Beijing, China
Bachelor of Engineering in Department of Automation

Work Experience

Jun. 2011 - Sep. 2011 Adobe Systems - San Francisco, CA, USA
(full-time) **Research Intern** in the Advanced Technology Labs (ATL)

- Worked on online machine learning algorithms for real-time semi-supervised source separation, with application to real-time speech denoising in non-stationary noise environments

Advisor: Gautham J. Mysore (gmysore <at> adobe [dot] com)

Sep. 2011 - Dec. 2011 (part-time)

Sep. 2008 - Jun. 2011 Northwestern University - Evanston, IL, USA
Research Assistant in Department of Electrical Engineering and Computer Science

- Worked on machine learning algorithms towards audio information retrieval applications, e.g. multi-pitch estimation and tracking, audio-score alignment, source separation, etc.

Advisor: Bryan Pardo (pardo <at> northwestern [dot] edu)

Jul. 2007 - Apr. 2008 Microsoft Research Asia (MSRA) - Beijing, China
Research Intern in Speech group

- Worked on an automatic music recommendation system

Advisor: Lie Lu (llu <at> dolby [dot] com)

Apr. 2007 - Jun. 2007 Stanford University - Stanford, CA, USA

Visiting Researcher in Center for Computer Research in Music and Acoustics

- Worked on audio signal processing algorithms

Host: Julius O. Smith III (jos <at> ccrma [dot] stanford [dot] edu)

Sep. 2005 - Mar. 2007 Tsinghua University - Beijing, China

Research Assistant in State Key Laboratory of Intelligent Technology and Systems

- Worked on machine learning algorithms towards audio information retrieval applications, e.g. multi-pitch estimation and source separation

Advisor: Changshui Zhang (zcs <at> tsinghua [dot] edu [dot] cn)

Jul. 2003 - Aug. 2003 NTP CO., LTD - Shenzhen, Guangdong, China

Software/Hardware Developer

- Developed a motor control system

Additional Education

Jun. 2011 Purdue University - West Lafayette, IN, USA

Machine Learning Summer School

Jul. 2005 - Aug. 2005 Lotus Hill Inst. for Computer Vision and Information Science - Ezhou, Hubei, China

Computer Vision and Pattern Recognition Summer School

Journal Publications

[3] Zhiyao Duan and Bryan Pardo, "Soundprism: an online system for score-informed source separation of music audio," *IEEE Journal of Selected Topics in Signal Processing.*, vol. 5, no. 6, pp. 1205-1215, 2011.

[2] Zhiyao Duan, Bryan Pardo, and Changshui Zhang, "Multiple fundamental frequency estimation by modeling spectral peaks and non-peak regions," *IEEE Trans. Audio Speech Language Process.*, vol. 18, no. 8, pp. 2121-2133, 2010.

[1] Zhiyao Duan, Yungang Zhang, Changshui Zhang, and Zhenwei Shi, "Unsupervised single-channel music source separation by average harmonic structure modeling", *IEEE Trans. Audio Speech Language Process.*, vol. 16, no. 4, pp. 766-778, 2008.

Peer-reviewed Conference Publications

[10] Zhiyao Duan, Gautham Mysore and Paris Smaragdis, "Online PLCA for real-time semi-supervised source separation," in Proc. *International Conference on Latent Variable Analysis and Source Separation (LVA/ICA)*, 2012.

[9] Zhiyao Duan and Bryan Pardo, "Aligning semi-improvised music audio with its lead sheet," in Proc. *International Society for Music Information Retrieval Conference (ISMIR)*, 2011.

[8] Zhiyao Duan and Bryan Pardo, "A state space model for online polyphonic audio-score alignment," in Proc. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2011.

[7] Zhiyao Duan, Jinyu Han and Bryan Pardo, "Song-level multi-pitch tracking by heavily constrained clustering," in Proc. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2010, pp. 57-60.

[6] Zhiyao Duan, Jinyu Han, and Bryan Pardo, "Harmonically informed multi-pitch tracking," in Proc. *International Society for Music Information Retrieval Conference (ISMIR)*, 2009, pp. 333-338.

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[5] Zhiyao Duan, Lie Lu, and Changshui Zhang, “Collective annotation of music from multiple semantic categories,” in Proc. *International Conference on Music Information Retrieval (ISMIR)*, 2008.

[4] Zhiyao Duan, Lie Lu, and Changshui Zhang, “Audio tonality mode classification without tonic annotations”, in Proc. *International Conference on Multimedia & Expo (ICME)*, 2008.

[3] Zhiyao Duan, Changshui Zhang, “A probabilistic approach to multiple fundamental frequency estimation from the amplitude spectrum peaks”, in Proc. *Music, Brain and Cognition (MBC) workshop in the Twenty-first Annual Conference on Neural Information Processing Systems (NIPS)*, 2007.

[2] Zhiyao Duan, Dan Zhang, Changshui Zhang, and Zhenwei Shi, “Multi-pitch estimation based on partial event and support transfer”, in Proc. *International Conference on Multimedia & Expo (ICME)*, pp.216-219, 2007.

[1] Nelson Lee, Zhiyao Duan, and Julius O. Smith, “Excitation signal extraction for guitar tones”, in Proc. *International Computer Music Conference (ICMC)*, 2007.

Teaching

Fall, 2011	EECS 349 - Machine Learning	TA: giving lectures, designing and grading homework
Fall, 2010	EECS 349 - Machine Learning	TA: giving lectures, designing and grading homework
Fall, 2007	Introduction to Artificial Intelligence	TA: grading homework
Fall, 2006	Visual C++	TA: leading the lab session
Spring, 2006	C++	TA: leading the lab session

Selected Talks

Dec. 14, 2011	Title: <i>An Approach to Multi-pitch Tracking of Polyphonic Music</i> Dolby Laboratories – Beijing, China
Dec. 13, 2011	Title: <i>An Approach to Multi-pitch Tracking of Polyphonic Music</i> Tsinghua University, Department of Automation – Beijing, China
Dec. 13, 2011	Title: <i>An Approach to Multi-pitch Tracking of Polyphonic Music</i> Peking University, Institute of Computer Science & Technology – Beijing, China
Aug. 24, 2011	Title: <i>An Approach to Multi-pitch Tracking of Polyphonic Music</i> Stanford University, The Center for Computer Research in Music and Acoustics (CCRMA) – Stanford, CA, USA

Honors and Awards

Jun. 2011	Machine Learning Summer School at Purdue University Scholarship
Apr. 2011	Chinese Government Award for Outstanding Self-Financed Students Abroad
Jul. 2010	Student Travel Grant for International Society for Music Information Retrieval conference (ISMIR)
2008 - 2009	W. Murphy Fellowship in Northwestern University
Sep. 2008	Student Travel Grant for International Conference on Music Information Retrieval (ISMIR)
Apr. 2008	Excellent Intern in Microsoft Research Asia (MSRA)

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2005 - 2006	Excellent League Member in Tsinghua University
Dec. 2002	Champion of the Fourth Tsinghua University Electronic Design Competition, the Best Control Scheme Prize, as the team leader (more than 200 teams participated)
2002 - 2003	First-Class Scholarship for Academic Excellent Students of Tsinghua University
2001 - 2002	Second-Class Scholarship for Academic Excellent Students of Tsinghua University
2000 - 2001	Second-Class Scholarship for Academic Excellent Students of Tsinghua University

Academic Service

2011	Computer Science Review	Reviewer
2011	Audio Engineering Society (AES) 42nd International Conference	Reviewer
2010-11	IEEE Transactions on Audio, Speech and Language Processing	Reviewer
2010	IEEE Journal of Selected Topics in Signal Processing	Reviewer
2010	IEEE Signal Processing Letters	Reviewer
2010	IEEE Transactions on Image Processing	Reviewer
2010-11	EURASIP Journal on Advances in Signal Processing	Reviewer
2010-11	International Society for Music Information Retrieval conference (ISMIR)	Reviewer
2010	IEEE International Conference on Multimedia & Expo (ICME)	Extended Reviewer
2009-11	International Conference on Music Information Retrieval (ISMIR)	Reviewer

Organizational Service

Sep. 2009 - Jul. 2010	Member of Northwestern University Chinese Students & Scholars Association
Feb. 2005 - Jun. 2005	Team leader in the Culture Sector of Tsinghua Graduate Association
Feb. 2005 - Jun. 2005	Propaganda team leader in the Culture Sector of Tsinghua Graduate Association
Sep. 2004 - Jan. 2005	Member of the Culture Sector of Tsinghua Graduate Association
Sep. 2003 - Jun. 2004	Organization commissary of Class Automation 01
Sep. 2001 - Jun. 2002	Literature commissary of Class Automation 01
Feb. 2001 - Jun. 2006	Chief performer and teacher of the Euphonium Part in Tsinghua University Wind Symphony Orchestra, Won the first prize of National University Students' Art Show in 2005

Skills

Math	Real Analysis, Abstract Algebra, Topology
Programming	Matlab, C/C++/C#, Assembly language (Intel x86 series)
Language	Chinese Mandarin (native), English (fluent)
Music	Euphonium, Violin
Sports	Running: Participated in Beijing International Marathon successfully in 2006 (half distance: 21km)

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Swimming, Tennis, Table tennis, Skating, etc.