

RUYUAN ZHANG

Curriculum Vitae (Updated 03/17/17)

Contact

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Education

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| 2010-2016 | University of Rochester | Ph.D. , Brain & Cognitive Sciences (BCS)
Advisors: Dr. Duje Tadin and Dr. Daphne Bavelier |
| 2010 - 2014 | University of Rochester | M.A. , Brain & Cognitive Sciences |
| 2006 - 2010 | Peking University | B.A. , Psychology; Minor: Computer Science |

PhD Advisory Committee: Dr. Duje Tadin, Dr. Daphne Bavelier and Dr. Robert Jacobs (Chair)

PhD Thesis Committee: Dr. Duje Tadin, Dr. Daphne Bavelier, Dr. Brad Mahon, Dr. Zhonglin Lu (OSU), Dr. Krystel Huxlin (Chair)

Research Experience

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| 2016 - Present | Postdoctoral Research Associate (Advisor Dr. Kendrick Kay)
Center for Magnetic Resonance Research, Department of Radiology
University of Minnesota |
| 2010 - 2016 | Graduate student (Advisor Dr. Duje Tadin)
Department of Brain & Cognitive Sciences and Center of Visual Science,
University of Rochester |
| 2010 - 2016 | Graduate student (Advisor Dr. Daphne Bavelier)
Department of Brain & Cognitive Sciences and Center of Visual Science,
University of Rochester
FPSE, University of Geneva, Switzerland |

- 2007 - 2010 **Undergraduate Research Assistant (Advisor: Dr. Fang Fang)**
Vision and Brain Imaging Lab, Department of Psychology, Peking University
- 2008 - 2009 **Undergraduate Research Assistant (Advisor: Dr. Kan Zhang)**
Cognitive and Engineering Psychology Lab, Institute of Psychology, Chinese Academy of Sciences.

Awards and honors

- 2013 Student Travel Award for 12th Vision Sciences Society Annual Meeting
- 2010 Graduate Fellowship from Department of Brain & Cognitive Sciences, University of Rochester
- 2009 Undergraduate Research Fellowship from Institute of Psychology, Chinese Academy of Science
- 2009 Class Scholarship in Department of Psychology, Peking University
- 2008 Undergraduate Research Fellowship from Peking University
- 2008 GuangHua Undergraduate Scholarship, Peking University
- 2007 Class Scholarship in Department of Psychology, Peking University

Research Method and Skills

Research skills: Visual psychophysics, fMRI, computational modeling.
Research/Programming software: BrainVoyager, Matlab, Psychtoolbox, Freesurfer

Publications

- Kwon, O.S., **Zhang, R.**, & Tadin, D. Temporal evolution of motion direction judgments (in preparation).
- **Zhang, R**, Kwon, O.S & Tadin,D. When learning impairs performance: divisive gain control explains adaptive learning of motion (in preparation).
- **Zhang, R** & Tadin,D. Complete transfer between component and pattern motion reveals learning induced plasticity in MT (in preparation).

- Park Wj, Schauder KB, **Zhang R**, Bennetto L, Tadin D. Perceptual inefficiency characterized by increased internal noise and reduced external noise filtering in autism spectrum disorder (in revision).
- **Zhang, R.**, Lu, Z., Martin, B., Jaeggi, Susanne., Green C.S., & Bavelier, D. 'Learning to learn ' as a mechanism for generalization of learning: Lessons from action video games. ***Nature Human Behavior*** (in revision).
- Nyquist J.B., Lappin J.S., **Zhang, R** & Tadin,D. (2016) Perceptual Training yields rapid improvements in visually impaired youth. ***Scientific Report*, 6**, 37431.
- Cavanaugh M.R**, **Zhang, R****. Melnick M.D., Das.A., Roberts,M., Tadin,D., Carrasco,M., Huxlin,.K.R. (**=equally contributing authors). (2015) Visual recovery in cortical blindness is limited by high internal noise. ***Journal of Vision*, 15(10)**, 9-9.
- V. R. Bejjanki**, **Zhang, R****, Li. R., Lu. Z., Pouget, A., Green, CS, & Bavelier, D. (2014) Action video game facilitates development of better perceptual template. (**=equally contributing authors, listed in alphabetical order). ***Proceedings of the National Academy of Sciences***, 111(47), 16961-16966
- **Zhang, R****. Kwon, O.S**. & Tadin, D. (2013) Illusory motion of stationary stimuli in visual periphery: evidence for a strong centrifugal prior. (**=equally contributing authors). ***Journal of Neuroscience***, 33, 4415-4423.

Ongoing Research Projects

- **Zhang, R.**, Yeatman, J., Kay,K., Bottom-up and top-down influences in word reading.
- **Zhang,R.**, Chen Q., Mahon,B. Decode motion processing in cortical blind patients.
- **Zhang, R**, Jaeggi, S.M., Buschkuhl, M., & Bavelier, D. Working memory and skill learning as a function of video game experience.
- Kwon, O.S., **Zhang, R.**, & Tadin, D. Temporal evolution of motion direction judgments.
- **Zhang, R.**, Engel, S., Kay, K., Attention dependent binocular rivalry in human visual cortex.
- **Zhang, R.**, Kay,K. Modeling attentional effects on spatial representation in human

ventral temporal cortex.

Conference Presentations

2016

- **Zhang, R.**, Tadin, D. (2016). The complete transfer of learning between component and pattern motion: psychophysical evidence for training-induced plasticity in MT. (**Poster** at Vision Sciences Society Annual Meeting 2016)

2015

- **Zhang, R.**, Kwon, O.S., & Tadin, D. (2015). Specificity and transfer of perceptual learning of motion. (**Poster** at Vision Sciences Society Annual Meeting 2015)
- Kwon, O.S., **Zhang, R.**, & Tadin, D. (2015). Temporal evolution of motion direction judgments. (**Talk** at Vision Sciences Society Annual Meeting 2015)

2014

- **Zhang, R.**, Jaeggi, S.M., Buschkuhl, M., & Bavelier, D. (2014). Working memory and skill learning as a function of video game experience. (**Poster** at Association for Psychological Science Convention 2014)
- Cavanaugh, M.R., Melnick, T.M., **Zhang, R.**, Roberts, M., Das, A., Tadin, D., Carrasco, M., & Huxlin, K.R., (2014). Residual inefficiencies of recovered vision in cortically blind fields – insights from the equivalent noise analysis. (**Poster** at Vision Sciences Society Annual Meeting 2014)
- Cavanaugh, M.R., Das, A., Melnick, T.M., **Zhang, R.**, Tadin, D., Carrasco, M., & Huxlin, K.R., (2014). Engineering the Eye IV Restoring Vision 29th Symposium. Center of Visual Science, University of Rochester. (**Poster** at 29th Center of Visual Science Symposium)

2013

- **Zhang, R.**, Green, S., Lu, Z., & Bavelier, D. (2013). Speeding up Learning: Action Video Games and Perceptual Learning. Journal of Vision, 13(9), 1089-1089. (**Talk** at Vision Sciences Society Annual Meeting 2013)

2012

- **Zhang**, R.**, Kwon**, O.S., & Tadin, D. (2012) Illusory motion of stationary stimuli in visual periphery: evidence for a strong centrifugal prior. (**=equally contributing authors). Computational Foundations of Perception & Action 28th Symposium. Center of Visual Science, University of Rochester. (**Poster** at 28th Center of Visual Science Symposium)
- **Zhang, R.**, Bejjanki, V. R., Lu, Z., Green, S., Pouget, A., & Bavelier, D. (2012). Action Video Games playing improves learning to learn in perceptual learning. Journal of

Vision, 12(9), 1130-1130. (**Poster** at Vision Sciences Society Annual Meeting 2012)

2011

- **Zhang, R.**, Li, R., Lu, Z., & Bavelier, D. (2011). Perceptual templates improvement through action video game playing and comparison to perceptual learning. *i-Perception*, 2(4), 269-269. (**Abstract** at Asia-Pacific Conference of Vision 2011)
- **Zhang, R.**, & Tadin, D. (2011). Illusory centrifugal motion direction observed in brief stimuli: psychophysics and energy model. *i-Perception*, 2(4), 389-389. (**Abstract** at Asia-Pacific Conference of Vision 2011)
- **Zhang, R.**, & Tadin, D. (2011). Illusory centrifugal motion direction observed in stationary stimuli: Dependency on duration and eccentricity. *Journal of Vision*, 11(11), 769-769. (**Poster** at Vision Sciences Society Annual Meeting 2011)

2009

- **Zhang, R.** & Fang, F. (2009). Top-down influence on invisible face to gain access to awareness during continuous flash suppression (poster presentation). Workshop on Cognitive Science: From Cellular Mechanisms to Computational Theories (CS-2009), May, 2009, Beijing, China. (**Poster** at Beijing International Cognitive Science Workshop)

Computational Methods Courses

Peking University, Computer Science

Introduction to Computer Science

Data Structure and Algorithm

Tsinghua University, Computer Science

Computational Neuroscience	Instructor: Dr. Zhaoping Li	Audit
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University of Rochester, Brain & Cognitive Sciences (BCS)

Computational Neuroscience	Instructor: Dr. Alex Pouget	Grade: A
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Computational Methods in Cognitive Science	Instructor: Dr. Robert Jacobs	Grade: A
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Computational Neuroscience (Spring 2015)	Instructor: Dr. Ralf Haefner	Audit
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Online Courses

Computational Neuroscience (Coursera)	Instructor: Dr. Rajesh P.N. Rao and Dr. Adrienne Fairhall
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Machine Learning (Coursera)	Instructor: Dr. Andrew Ng
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Statistical Analysis of fMRI Data (Coursera)	Instructor: Dr. Martin Lindquist
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Introduction to Statistics: Descriptive, Probability and Inference (Edx)	Instructor: Dr. Ani Adhikari
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Ongoing and planned courses

Probabilistic Graphical Models (Coursera) Instructor: Dr. Daphne Koller

Neural Networks for Machine Learning (Coursera) Instructor: Dr. Geoffery Hinton

An Introduction to Interactive Programming in Python (Coursera)

Journal Review

Frontiers in System Neuroscience (Ad Hoc)

Talks

- 2016 Perception Lunch Talk, Department of Psychology, University of Minnesota, Twin Cities.
- 2016 Talk, the School of Psychology, South China Normal University, Guangzhou, China
- 2016 Talk, Neuro-Cognitive Research Center, South University of Science and Technology of China
- 2016 Talk, Department of Psychology, Zhejiang University, Hangzhou, China.
- 2016 Talk, Department of Psychology, the School of Education, Suchow University, Suchow, China.
- 2016 Talk, Institute of Cognitive Neuroscience, the School of Psychology and Cognitive Science, East China Normal University, Shanghai, China.
- 2015 Talk, National Institute of Health, Laboratory of Dr. Biyu He
- 2015 Talk, University of California, Berkeley, Laboratory of Dr. Jack Gallant
- 2015 Talk, Center of Visual Science, University of Rochester
- 2014 Graduate student lunch talk, Department of Brain& Cognitive Sciences, University of Rochester
- 2013 Graduate student lunch talk, Department of Brain& Cognitive Sciences, University of Rochester

Teaching

University of Rochester

- 2015 Instructor for graduate course *Special Topic in Vision* (BCS)
- 2014 Teaching assistant for undergraduate course *Foundation of Cognitive Sciences* (BCS111)
- 2013 Teaching assistant for undergraduate course *Foundation of Cognitive Sciences* (BCS111)
- 2011 Teaching assistant for undergraduate course *Perception & Action* (BCS151)

Peking University

- 2009 Teaching assistant for undergraduate course *Central Neuro System*
- 2010 Teaching assistant for undergraduate course *Cognitive Neuroscience*

Professional Membership (Past and Present)

Vision Sciences Society (2010-present)

Association for Psychological Science (2014-2015)

Other research-related activities

- 2015 Participant, University of Rochester Deep Learning Reading Group
- 2014-2016 Organizer and participant, Center for Visual Science journal club
- 2015 Student host for Prof. Christopher Baker, Boynton Colloquium Series Lecture, Center of Visual Science
- 2014 Student host for Prof. Sheng He, Boynton Colloquium Series Lecture, Center of Visual Science
- 2012 Student host for Prof. Takeo Watanabe, Boynton Colloquium Series Lecture, Center of Visual Science