

Lixiang Xu

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Research interests Computational neuroscience, natural language processing, human brain data, fMRI, EEG, machine learning, computational geometry

Education **University of Texas at Austin** Austin, Texas
Ph.D. in Physics (Research in computational neuroscience) Sep 2014 – Present
Advisor: Professors Alexander G. Huth. *GPA: 3.75.*

University of Science and Technology of China Hefei, Anhui, China
B.S. in Physics Sep 2010 – May 2014
Advisor: Professors Zhensheng Yuan. *GPA: 3.85.*

Honors and scholarships Second Prize in college students mathematical competition (CMS) 2012
National outstanding undergraduates (USTC) 2014
National scholarship (USTC) 2013

Research experience **Huth Lab**
Adviser: Alexander G. Huth (UT-Austin) Jan 2018 – Present

- Research on understanding the saliency of distractors using fMRI and EEG. We designed distracting experiments with narrative stories and natural sounds, collected thousands of human behavior data on gorilla and prolific platform, and conducted statistical and linear regression analysis to study distracting effects, which will be used to design fMRI and EEG experiments. (In progress)
- Research on applying shared response model on building better encoding models. We reported the sparse experimental paradigm to collect brain data with limitations and train better language encoding models.
- Research on calculating interior distance in complex 3D body, human cortex for example, with heat kernel method.
- Research on improving biharmonic approximation method by sampling landmarks with saddle points.

Light Matter Interactions at the Nano Scale

Adviser: Professor Xiaoqin (Elaine) Li (UT-Austin) Sep 2014 – Jun 2017
Research on light matter quantum interactions on atomic thin materials, such as WSe_2 and $MoSe_2$.

Nanoelectronic Materials Research Group

Adviser: Professor Chih-Kang (Ken) Shih (UT-Austin) Jun 2013 – Sep 2013

We measured excitation states of semiconductor materials with photoluminescence spectroscopy.

Hefei National Laboratory for Physical Science at the Microscale

Adviser: Professor Zhensheng Yuan (USTC) Jan 2012 – April 2014

We set up optical lattices to trap and manipulating ultra-cold atoms and simulate Bose-Einstein Condensate. I researched the applications of atomic clock in ultra-cold experiments and simulated light diffraction in ultra-small slit.

Publications

Jan 2018 – present, in *Computational Neuroscience*

Sparse experimental design for brain data (in preparation)

Lixiang Xu, Amanda I. LeBel, Alexander G. Huth.

Sep 2014 – Oct 2017, in *Physics*

Neutral and charged inter-valley biexcitons in monolayer MoSe₂

K. Hao, J. F. Specht, P. Nagler, Lixiang Xu, K. Tran, A. Singh, C. K. Dass, C. Schuller, T. Korn, M. Richter, A. Knorr, X. Li and G. Moody

Nature Communications, 2017.

Trion valley coherence in monolayer semiconductors

K. Hao, Lixiang Xu, F. Wu, P. Nagler, K. Tran, X. Ma, C. Schuller, T. Korn, A. H. MacDonald, G. Moody and X. Li.

2D Materials, 2017.

Coherent and incoherent coupling dynamics between neutral and charged excitons in monolayer MoSe₂

K. Hao, Lixiang Xu, P. Nagler, A. Singh, K. Tran, C. K. Dass, C. Schuller, T. Korn, X. Li and G. Moody

Nano Letters, 2016.

Direct measurement of exciton valley coherence in monolayer WSe₂

K. Hao, G. Moody, F. Wu, C. K. Dass, Lixiang Xu, C. H. Chen, M. Y. Li, A. H. MacDonald and X. Li

Nature Physics, 2016.

Coherent quantum dynamics of excitons in monolayer transition metal dichalcogenides

G. Moody, K. Hao, C. K. Dass, A. Singh, Lixiang Xu, K. Tran, C. H. Chen, M. Y. Li, L. J. Li, G. Clark, G. Berghauser, E. Malic, A. Knorr, X. Xu and X. Li

International Society for Optics and Photonics, 2016.

Skills

Programming

Proficient in: python, tensorflow, matlab

Familiar with: pytorch, java script, html

Languages

English (fluent), Chinese (advanced)

Conference presentations

Society of Neuroscience

Oct 2019

Sparse experimental design for encoding models.

American Physical Society

Mar 2017

Neutral and charged inter-valley biexcitons in monolayer transition metal dichalcogenides.

Other interests

Play and design computer games, FCPX.