

Jiaxin (Cindy) Tu

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EDUCATION

Washington University in St. Louis

Ph.D. Candidate in Neuroscience (GPA 3.83/4.00)

Dissertation: *Cortical functional organization in early childhood*

Advisor: Dr. Muriah Wheelock (co-advised with Dr. Adam Eggebrecht), Department of Radiology, Washington University in St. Louis

St. Louis, MO, USA

Expected Aug 2025

University of Minnesota Twin Cities

Non-degree Student - Honors Physics I (GPA 3.30/4.00)

Minneapolis, MN, USA

2018-2019

University of Cambridge

B.A. (Hons) Natural Sciences (Physiology, Development and Neuroscience) (Class 2.1)

Dissertation: *Understanding Drosophila Navigation Using Visual and Olfactory Cues*

Advisor: Dr. Trevor Wardill, Department of Physiology, Development and Neuroscience, University of Cambridge, UK

Cambridge, UK

2014-2017

RESEARCH TOPICS

Neuroimaging, functional connectivity, cognitive neuroscience, network neuroscience, neural coding

REFeree CONTACTS

Muriah D. Wheelock, PhD (mdwheelock@wustl.edu)

Adam E. Eggebrecht, PhD (aeggebre@wustl.edu)

Jung-Hoon Kim, PhD (jkim9@childrensnational.org)

PUBLICATIONS (h-index: 6, total citations: 188, Details in Google Scholar: [Jiaxin \(Cindy\) Tu](#))

In Prep:

- **Tu JC**, Myers MJ, Li W, Li J, Wang X, Dierker D, Day TKM, Snyder AZ, Latham A, Kenley JK, Sobolewski C, Wang Y, Labonte AK, Feczko E, Kardan O, Moore LA, Sylvester CM, Fair DA, Alison JT, Warner BB, Barch DB, Rogers CE, Luby JL, Smyser CD, Gordon EM, Laumann TO, Eggebrecht AT, Wheelock MD. The generalizability of cortical area parcellations across early childhood. *Cerebral Cortex* (In Press).
- **Tu JC**, Kim J, Luckett P, Adeyemo B, Shimony JS, Alison JT, Eggebrecht AT, Wheelock MD. Deep-learning based embedding of functional connectivity profiles in a low-dimension latent space for precision functional mapping. (*Under Review*).
- **Tu JC**, Moore LA, Wang X, Dierker D, Wang Y, Sobolewski CM, Kardan O, Miranda-Dominguez O, Day TKM, Latham A, Kenley JK, Feczko E, Fair DA, Alison JT, Warner BB, Luby JL, Rogers CE, Barch DM, Smyser CD, Gordon EM, Laumann TO, Eggebrecht AT, Wheelock MD. Commonality and Variability in Functional Networks In Early Childhood. (*In Prep*).

Peer-reviewed journal articles:

- **Tu JC**, Wang Y, Wang X, Dierker D, Sobolewski C, Day TKM, Kardan O, Miranda-Domínguez O, Moore L, Feczko E, Fair DA, Alison JT, Gordon EM, Laumann TO, Eggebrecht AT, Wheelock MD. A subset of cortical areas exhibit adult-like network patterns in early childhood. *Developmental Cognitive Neuroscience* (In Press)
- Kardan, O, Jones, N, Wheelock, MD, Angstadt, M, Michael, C, Molloy, MF, **Tu, JC**, Cope, LM, Martz, ME, McCurry KL, Hardee, JE, Rosenberg, MD, Weigard, AS, Hyde, LW, Sripada, CS, & Heitzeg, MM Assessing neurocognitive maturation in early adolescence based on baby and adult functional brain landscapes. *Developmental Cognitive Neuroscience* (In Press)
- **Tu JC**, Strain JF, Morris JC, Eck A, Babatunde B, Snyder AZ, Millar P, Preische O, Chhatwal JP, Cash DM, Cruchaga C, Fagan M, Fox, N, Graff-Radford NR, Hassenstab J, Jack CR, Karch CM, Levin J, McDade EM, Perrin RJ, Schofield PR, Xiong C, Morris JC, Jucker M, Benzinger TLS, Ances BM, Eggebrecht AT, Gordon BA, MD Wheelock and the Dominantly Inherited Alzheimer Network. (2024) Increasing hub vulnerability parallels disease severity in autosomal dominant Alzheimer's disease. *Network Neuroscience*. 8 (4): 1265-1290.

- Li J, Segel A, **Tu JC**, King K, Adeyemo B, Karcher N, Chen L, Eggebrecht AT, Wheelock MD. (2024). Network level analysis provides a framework for biological interpretation of machine learning results. *Network Neuroscience*. 8 (3): 762–790
- Myers MJ, Labonte AK, Gordon EM, Laumann TO, **Tu JC**, Wheelock MD, Nielsen AN, Schwarzlose R, Camacho MC, Warner BB, Luby JL, Barch DM, Fair DA, Petersen SE, Rogers CE, Smyser CD, and Sylvester CM. (2024) Functional parcellation of the neonatal brain. *Cerebral Cortex*. 34, bhae047.
- Wheelock MD, Strain JF, Mansfield P, **Tu JC**, Tanenbaum A, Preische O, Chhatwal JP, Cash DM, Cruchaga C, Fagan AM, Fox NC, Graff-Radford NR, Hassenstab J, Jack CR, Karch CM, Levin J, McDade EM, Perrin RJ, Schofield PR, Xiong C, Morris JC, Jucker M, Benzinger TLS, Ances BM, Eggebrecht AT, Gordon BA, and the Dominantly Inherited Alzheimer Network (2023). Brain network decoupling with increased serum neurofilament and reduced cognitive function in Alzheimer’s disease. *Brain*. 146, 2928-2943.
- Ebitz RB, **Tu JC**, Hayden BY. (2021). Rules warp feature encoding in decision-making circuits. *PLOS Biology*. 18 (11), e3000951.
- Yoo SBM, **Tu JC**, Hayden BY. (2021). Multicentric tracking of multiple agents by anterior cingulate cortex during pursuit and evasion. *Nature Communications*. 12 (1), 1985.
- Yoo SBM, **Tu JC**, Piantadosi ST, Hayden BY. (2020). The neural basis of predictive pursuit. *Nature Neuroscience*. 23 (2), 252-259.
- Mehta PS, **Tu JC**, LoConte GA, Meghan CP, and Hayden BY. (2019). Ventromedial prefrontal cortex tracks multiple environmental variables during search. *Journal of Neuroscience*. 39 (27), 5336-5350.

Accepted Conference Abstracts:

- **Tu JC**, Li J, Wang X, Dierker D, Sobolewski CM, Day TKM, Snyder A, Kenley J, Kaplan S, Feczko E, Kardan O, Miranda-Domínguez O, Moore A, Sylvester CM, Fair DA, Elison JT, Smyser CD, Gordon EM, Eggebrecht AT, Wheelock MD. “Early Life Neuroimaging: The Generalizability of Cortical Area Parcellations Across Development.” Poster presentation, Society for Neuroscience (Oct 2024)
- Barretto-Garcia M, **Tu JC**, Padoa-Schioppa C. “Neuronal activity in the orbitofrontal cortex of monkeys choosing between three options varying on three dimensions”. Poster presentation, Cognitive Computational Neuroscience, Boston (Aug 2024)
- **Tu JC**, Latham A, Kenley K, Camacho MC, Kardan O, Feczko E, Kaplan S, Day TKM, Sylvester C, Miranda-Domínguez O, Moore LA, Fair DA, Smyser CD, Elison JT, Laumann TO, Gordon EM, Eggebrecht AT, Wheelock MD “Maturation of cortical connectivity in the core functional systems – infancy through childhood” Poster presentation, Organization for Human Brain Mapping Annual Meeting, Seoul, South Korea (June 2024)
- Barretto-Garcia M, **Tu JC**, Padoa-Schioppa C. “Neuronal activity in the orbitofrontal cortex of monkeys choosing between three options varying on three dimensions”. Poster presentation, Society for Neuroscience, Washington DC (Nov 2023)
- **Tu JC**, Myers M, Sylvester C, Gordon EM, Laumann TO, Kardan O, Feczko E, Kaplan S, Day TKM, Miranda-Domínguez Ó, Moore LA, Sung S, Chamberlain TA, Snider K, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Development of Functional Systems In 0–2-year-olds” Poster Presentation and **Flash Talk**. Flux 2023, Santa Rosa, CA (Sept 2023)
- **Tu JC**, Myers M, Sylvester C, Gordon EM, Laumann TO, Kardan O, Feczko E, Kaplan S, Day TKM, Miranda-Domínguez Ó, Moore LA, Sung S, Chamberlain TA, Snider K, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Development of Functional Systems In 0-2-year-olds” Poster Presentation. Fetal, Infant, and Toddler Neuroimaging Group (FIT’NG) 2023, Santa Rosa, CA (Sept 2023)
- Feng X, Li J, Segel A, **Tu JC**, Kardan O, Day TKM, Miranda-Domínguez Ó, Moore LA, Chamberlain TA, Snider K, Adeyemo B, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Effects of functional network model definition on biomarker outcome prediction” Poster Presentation, Organization for Human Brain Mapping Annual Meeting, Montréal, Canada (July 2023)
- **Tu JC**, Myers M, Sylvester C, Gordon EM, Laumann TO, Kardan O, Feczko E, Kaplan S, Day TKM, Miranda-Domínguez Ó, Moore LA, Sung S, Chamberlain TA, Snider K, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Developing and benchmarking functional parcellations in infant neuroimaging datasets” Poster Presentation, Organization for Human Brain Mapping Annual Meeting, Montréal, Canada (July 2023)
- **Tu JC**, Myers M, Sylvester C, Gordon EM, Laumann TO, Kardan O, Feczko E, Kaplan S, Day TKM, Miranda-Domínguez Ó, Moore LA, Sung S, Chamberlain TA, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Two alternative paths towards reliable infant network studies.” Poster Presentation, the 7th Whistler Scientific Workshop on Brain Functional Organization, Connectivity and Behavior, Whistler-Blackcomb, B.C., Canada (Feb 2023).
- **Tu JC**, Strain JF, Morris JC, Bateman RJ, Benzinger TLS, Eggebrecht AT, Ances BM, Gordon BA, MD Wheelock

and the Dominantly Inherited Alzheimer Network. “The level of hub disruption in autosomal dominant Alzheimer’s disease is related to cognitive decline.” Poster Presentation, Society for Neuroscience, San Diego, CA, USA (Nov 2022)

- **Tu J**, Yoo SB, Hayden BY. “Neural representation of allocentric and egocentric positions in a dynamic foraging task.” Poster presentation. Society for Neuroscience, San Diego, CA, USA (Nov 2018)

Department seminars/retreats/invited talks/project presentations:

- **Tu JC**, Kim J, Luckett P, Adeyemo B, Shimony JS, Eggebrecht AT, Wheelock MD. “Learning a Compact, Parcel-independent Representation of the fMRI Functional Connectivity.” Poster presentation. Computational Neuroscience Next Generation (CNNG) Symposium. Washington University in St. Louis. St. Louis, MO (Sept 2024)
- Noh K*, Zhang H*, Lu C*, Renard R*, **Tu JC***. Equilibrium Propagation as an Alternative Algorithm for Training Artificial Neural Networks. Oral presentation. Neuromatch Academy, NeuroAI Workshop (Aug 2024)
- **Tu JC**, Camacho MC, Day TKM, Miranda-Domínguez Ó, Moore LA, Kardan O, Feczko E, Fair DA, Elison JT, Laumann TO, Gordon EM, Eggebrecht AT, Wheelock MD “Untangling the Sensorimotor-to-Association and Local-to-Distributed Organization of Brain Development” Oral presentation. Developmental Neuroimaging meeting. Washington University in St. Louis. St. Louis, MO (May 2024)
- **Tu JC**, Myers MJ, Li W, Li J, Wang X, Dierker D, Haley C, Sobolewski C, Wang Y, Snyder A, Latham A, Kenley JK, Kaplan S, Feczko E, Day TKM, Kardan O, Elison JT, Smyser CD, Gordon EM, Laumann TO, Eggebrecht AT, Wheelock MD “Early Life Neuroimaging: The Generalizability of Cortical Area Parcellations from Infancy Through Adulthood” Oral presentation. Cognitive Computational and Systems Neuroscience Pathway Mini-retreat. Washington University in St. Louis. St. Louis, MO (May 2024)
- **Tu JC**, Myers M, Sylvester C, Gordon EM, Laumann TO, Kardan O, Feczko E, Kaplan S, Day TKM, Miranda-Domínguez Ó, Moore LA, Sung S, Chamberlain TA, Snider K, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Developing and benchmarking functional parcellations in infant neuroimaging datasets” Poster Presentation. Washington University in St. Louis Neuroscience Retreat. St. Louis, MO (Oct 2023)
- **Tu JC**, Myers M, Sylvester C, Gordon EM, Laumann TO, Kardan O, Feczko E, Kaplan S, Day TKM, Miranda-Domínguez Ó, Moore LA, Sung S, Chamberlain TA, Snider K, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Development of Functional Systems In 0–2-year-olds” Oral presentation, Intellectual and Developmental Disabilities Research Center (IDDRC) Seminar. St. Louis, MO (Sept 2023)
- **Tu JC**, Myers M, Sylvester C, Gordon EM, Laumann TO, Kardan O, Feczko E, Kaplan S, Day TKM, Miranda-Domínguez Ó, Moore LA, Sung S, Chamberlain TA, Snider K, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Benchmarking functional parcellations in infant neuroimaging” Poster Presentation. Washington University in St. Louis Graduate Research Symposium. St. Louis, MO (April 2023)
- **Tu JC**, Myers M, Sylvester C, Gordon EM, Laumann TO, Kardan O, Feczko E, Kaplan S, Day TKM, Miranda-Domínguez Ó, Moore LA, Sung S, Chamberlain TA, Snider K, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Benchmarking functional parcellations in infant neuroimaging” Poster Presentation. Washington University in St. Louis Imaging Retreat. St. Louis, MO (April 2023)
- **Tu JC**, Myers M, Sylvester C, Gordon EM, Laumann TO, Kardan O, Feczko E, Kaplan S, Day TKM, Miranda-Domínguez Ó, Moore LA, Sung S, Chamberlain TA, Snider K, Fair DA, Rosenberg MD, Smyser CD, Elison JT, Eggebrecht AT, MD Wheelock “Developing and benchmarking functional parcellations in infant neuroimaging datasets.” Oral presentation. Developmental Neuroimaging meeting. Washington University in St. Louis, St. Louis, MO (Dec 2022).
- **Tu JC**, Strain JF, Morris JC, Bateman RJ, Benzinger TLS, Eggebrecht AT, Ances BM, Gordon BA, MD Wheelock and the Dominantly Inherited Alzheimer Network. “The level of hub disruption in autosomal dominant Alzheimer’s disease is related to cognitive decline.” Poster Presentation. Washington University in St. Louis Neuroscience Retreat. Potosi, MO (Oct 2022)
- **Tu JC**, Strain JF, Morris JC, Bateman RJ, Benzinger TLS, Eggebrecht AT, Ances BM, Gordon BA, MD Wheelock and the Dominantly Inherited Alzheimer Network. “The level of hub disruption in autosomal dominant Alzheimer’s disease is related to cognitive performance.” Poster Presentation. Washington University in St. Louis Summer Program of Imaging in Neuroscience (SPIN). St. Louis, MO (July 2022)
- Jensen J*, Marathe S*, **Tu JC ***, Versteeg C* “Dynamics of Motor Cortex: Intrinsic or Extrinsic?” Oral presentation. Neuromatch Academy, Deep Learning Workshop (Aug 2021)
- Kwon S*, Liu T*, **Tu JC***, Yang FN* “Perception of gender-ambiguous faces: neural network of face adaptation” Oral presentation. Computational Sensory-Motor Neuroscience (CosMo) Summer School, Minneapolis, MN (July 2018)
- **Tu J***, S Chang*, Y Shen*, G. Jarvis. “Investigation of Effect of Drug Flibanserin on Platelet Aggregation.” Poster presentation. Pharmacology mini-project presentation, Cambridge, UK (March 2016)

AWARDS AND HONORS

- Fine Science & Merlie Travel Fellowship (\$1000) from the Washington University Neuroscience Graduate Program 2024
- Cognitive, Computational, and Systems Neuroscience (CCSN) Pathway Fellowship (\$32500 annually for two years) from McDonnell Center for Systems Neuroscience 2021-2023
- Competitive travel award (\$1000) from McDonnell Center for Systems Neuroscience 2023
- Awarded B.A. Summa Cum Laude with Honors in Natural Sciences, University of Cambridge 2017
- G C Grindley Fund for Undergraduate Summer Research (£1200) 2015

PEER-REVIEW EXPERIENCE

- Psychophysiology (1 manuscript), Development Cognitive Neuroscience (1 manuscript), Computational Cognitive Neuroscience Conference (5 extended abstracts), Communications Biology (1 manuscript)

PROFESSIONAL EXPERIENCE

Washington University in St. Louis

St. Louis,
MO

Graduate Research Assistant, PI: Muriah Wheelock (Co-mentored with Adam Eggebrecht) 2022-Present

- Processed and analyzed neuroimaging data for fMRI research projects (2 first-author journal articles; 3 manuscripts in revision/in prep + 4 additional co-authored journal articles; 4 conference poster presentations, 1 oral presentation).
- Employed unsupervised machine learning methods for mapping connectivity-defined brain regions in child development, contributing to three publications (including in revision/in prep).
- Delineated brain network alterations in Alzheimer's Disease using Graph Theory metrics and Statistical Models, contributing to a publication in Network Neuroscience.
- Using Deep-learning-based dimensionality reduction with beta-variational encoder (VAE) for advancing functional connectivity data visualization and analyses.
- Collaborated with a team of engineers, clinicians, statisticians, and scientists on data processing and data wrangling.

Assistant Instructor (Coding and Statistical Thinking in the Neurosciences L41 Bio5648) 2021

- Led weekly office hours and graded homework for one semester
- Taught one class in bootstrapping and resampling strategies

Rotation Student 2019-2021

- Surgeries on rat and monkey models, behavioral training for mice, rats, and monkeys, collected and processed single-neuron electrophysiology and 2-photon calcium imaging data, analyzed behavioral and neural data with MATLAB and R

The Biotechnology and Life Sciences Advising Group (BALSA)

St. Louis,
MO
2022-2023

Project Manager (1 project)

- Led a team of four consultants to research on market entry research for health monitoring products and digital platform

Consultant (2 projects)

- Conducted primary research with members to measure the level of engagement and impact of a research consortium
- Interviewed two faculty members, designed five online survey questions to obtain a 75% response rate, and drafted results for investor-facing materials
- Generated and presented key recommendations to directors of a research consortium about future events
- Conducted market analysis and researched market entry strategies for a biotechnology start-up company with a cryo-preservation media product
- Segmented the market with 100+ companies and conducted competitor analysis for product
- Presented results and recommendations to the CEO of a biotechnology start-up company

University of Minnesota Twin Cities

Minneapolis,
MN

Research technician, PI: Benjamin Hayden

2017-2019

- Trained undergraduate and graduate research assistants on the use of software to conduct behavioral experiments, electrophysiology data cleaning, and video data labeling
- Conducted quantitative analysis on in-vivo electrophysiology recordings to study neural tuning
- Collected and processed intracranial EEG data in a clinical setting
- Presented at one international conference and co-authored four papers in peer-reviewed journals

University of Cambridge

Cambridge,
UK

Undergraduate Researcher, PI: Trevor Wardill

- Thesis Research on Drosophila sensory preferences and analyzed data with 4-parameter logistic models

2016-2017

Summer Undergraduate Researcher, PI: Trevor Robbins

2015

- Recruited and screened human participants
- Collected behavioral and skin conduction data for a Pavlovian-To-Instrumental Transfer study

SUMMER SCHOOL AND PROFESSIONAL DEVELOPMENT WORKSHOPS ATTENDED

National Institute of Health (NIH)

11/2024

- Neuro AI Workshop

Kaggle

11/2024

- 5-Day Gen AI Intensive

Leadership and Management in Action Program (L-MAP) course

11/2024

Neuromatch Academy Summer School – NeuroAI

07/2024

- Group project: “Equilibrium Propagation as an Alternative Algorithm for Training Artificial Neural Networks”

The 7th Whistler Scientific Workshop on Brain Functional Organization, Connectivity and Behavior

02/2023

Women in STEM (WiSTEM) Career Seminar, Washington University in St. Louis

12/2022

- Searching for science-oriented job opportunities (organizer)

The Teaching Center, Washington University in St. Louis

2022

- Asking Questions to Improve Learning
- Providing Verbal Feedback to Students
- Who’s in Charge?

Neuroimaging Laboratories, Washington University in St. Louis

06/2021

- Neuroimaging techniques workshops

Neuromatch Academy Summer School – Deep Learning

08/2021

- With a group project: “Dynamics of Motor Cortex: Intrinsic or Extrinsic?”

Computational Sensory-Motor Neuroscience (CosMo) Summer School

08/2018

- With a group project: “Perception of Gender-ambiguous Faces: a Neural Network of Face Adaptation”

Udacity

07/2017

- Bertelsmann Data Science Challenge Scholarship Course

Coursera

2015-2020

- Machine Learning (Stanford University)
- Introductory Human Physiology (Duke University)
- Fundamentals of Reinforcement Learning (University of Alberta & Alberta Machine Intelligence Institute)
- Introduction to AI and Machine Learning on Google Cloud
- Introduction to Generative AI

Institute of Neuroscience, Chinese Academy of Sciences

08/2016

- Neuroscience Summer School with rotations in multiple labs

Graduate Coursework

- Fundamentals of Molecular Cell Biology (L41 BIOL 5068)
- Cellular Neurobiology (L41 BIOL 5571)
- Neural Systems (L41 BIOL 5651)
- The Science of Behavior (L41 BIOL 5665)
- Coding and Statistical thinking in the Neurosciences (L41 BIOL 5648)
- Biological Neural Computation (L41 BIOL 5657)
- Oral Presentation of Scientific Data (L41 BIOL 5565)
- Advanced Topics in Neuroscience: Neuroimaging nanocourse (L41 BIOL 5989)

- Communicating science: writing for multiple audiences (L41 BIOL 5866)
- Ethics and Research Science (L41 BIOL 5011)
- 1st Year Fundamentals (Grant writing) (L41 BIOL 5646)
- Cognitive Computational and Systems Neuroscience Project Building (L41 BIOL 5622)
- Linear Statistical Models (L24 MATH 439) (audit)
- Advanced Cognitive, Computational, and Systems Neuroscience (E62 BME 519)
- Applications of Deep Neural Networks (T81 INFO 558)

SERVICE AND OUTREACH ACTIVITIES

Washington University in St. Louis

St. Louis,
MO

Secretary Grad Nature Trippers	2024-2025
President Grad Nature Trippers	2023-2024
<ul style="list-style-type: none"> Organized committee meetings and facilitated key communications in the club, co-initiate the club website 	2023-2024
Vice-president Women In STEM (WiSTEM)	
<ul style="list-style-type: none"> Ensured each division had access to resources and help for organizing events, oversaw club operation 	2022-2023
Professional Development Chair Women In STEM (WiSTEM)	
<ul style="list-style-type: none"> Initializing monthly Growing Up in Science conversation series specifically inviting women scientists to share their struggles and career experience; organized one career seminar for job search 	2022-2023
General Committee DBBS Student Advisory Committee (SAC)	2021-Present
Peer Mentor DBBS Neuroscience Program	2021, 2023
Volunteer Demonstrator Amazing Brain Carnival Science Fair	
Research Mentor Young Scientist Program	