

# Baihan Lin

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Machine Learning • Neuroscience • Deep Learning • Applied Mathematics • Biomedical Informatics • Psychology • HCI

## EDUCATION

### Columbia University (CU)

Zuckerman Mind Brain Behavior Institute, CU Medical Center  
2017.09 - 2022.06 (expected) | New York, USA

|         |   |     |
|---------|---|-----|
| Ph.D.   | Computational Neuroscience              | 22' |
| M.Phil. | Computational Systems Biology           | 20' |
| M.A.    | Cellular & Molecular Biomedical Studies | 19' |

### University of Washington (UW)

Department of Applied Mathematics  
2017.09 - 2020.06 | Seattle, USA

|      |                     |     |
|------|---------------------|-----|
| M.S. | Applied Mathematics | 20' |
|------|---------------------|-----|

NIH Computational Neuroscience Training Program  
2013.09 - 2017.06 | Seattle, USA

|      |                                     |     |
|------|-------------------------------------|-----|
| B.S. | Applied & Computational Mathematics | 17' |
| B.A. | Psychology – Honors Program         | 17' |

## GRADUATE COURSEWORK

### Applied Mathematics

UW: Adv. Linear Algebra & Numerical Analysis (A-)  
UW: Methods for Partial Differential Equations (A-)  
UW: Probability & Stochastic Process (A-)  
UW: Mathematical Theory of Cellular Dynamics (A-)  
UW: Computational Methods for Data Analysis (A-)

### Computer Science

CU: Bandits & Reinforcement Learning (A+)  
GT: Software Development Process (A)  
GT: Adv. Artificial Intelligence (A)  
UW: High-Performance Computing (A+)

### Systems Biology

UW: Mathematical Analysis in Biology & Medicine (A+)  
CU: Genomics of Gene Regulation (A)

### Theoretical Neuroscience

CU: Intro. to Theoretical Neuroscience (A)  
CU: Adv. Topics in Theoretical Neuroscience (A-)  
CU: Systems & Developmental Neurobiology (A)

## RECOGNITIONS

### Grants

|             |            |                          |                                 |
|-------------|------------|--------------------------|---------------------------------|
| 2020        | Conference | INTERSPEECH Travel Grant | by INTERSPEECH 2020             |
| 2020        | Conference | MICCAI Travel Grant      | by MICCAI 2020                  |
| 2019        | Conference | IJCAI Travel Grant       | by IJCAI 2019                   |
| 2019        | Conference | NeurIPS Travel Grant     | by NeurIPS 2019 LMRL Workshop   |
| 2019        | Conference | ISMB Travel Grant        | by Columbia University GSO      |
| 2017 - 2018 | University | Cloud Computing Grant    | by University of Washington RCC |
| 2014 - 2016 | NIH        | CompNeuro Training Grant | by NIH on UW CompNeuro students |

### Fellowships

|                        |            |                            |   |
|------------------------|------------|----------------------------|---|
| 2019                   | University | Lead Teaching Fellowship   | by Columbia University                  |
| 2017                   | University | Systems Biology Fellowship | by Columbia University                  |
| 2017                   | University | Prestigious Fellowship     | by UC Berkeley (Nominated)              |
| 2017                   | University | Dean's Prize Fellowship    | by Rice University (Declined the offer) |
| 2016 - 2017            | Industry   | Amazon Catalyst Fellowship | by Amazon on OsteoApp                   |
| 2015 - 2016            | Industry   | Mary Gates Scholarship     | by Bill & Melinda Gates Foundation      |
| 2013, 2014, 2016, 2017 | University | Dean's List Scholarship    | by University of Washington             |
| 2011 - 2012            | Industry   | Tencent Scholarship        | by Tencent                              |

### Awards

Engineering: iGEM 2013 (Gold); MIT EurekaFest 2011 (Merit)  
Olympiads: WCA-Math 2009 (2nd); NChemO 2011 (3rd); NChemO 2011, NBioO 2011, NOInfo 2009 (GD 2nd)

# RESEARCH

## Independent projects

On bandits/RL [C8], topology [E3], audio [P6][C7], computer vision [C6] and information theory [P11][P4][C2].

## IBM Research

★ E-Psychiatry (Host: G. Cecchi); AI Foundations (Host: I. Rish, D. Bouneffouf) PhD Research Intern  
2017/2018/2019/2020.07 – .09 | Yorktown Heights, USA [P10][P9][P7][C5][C3][C1][E7][E6][E4]  
Project: develop neuro-inspired reinforcement learning for computational phenotyping and behavioral modeling.

## Microsoft Research

★ HCI; EPIC-Extended Perception, Interaction, & Cognition (Host: M. Gonzalez-Franco) Visiting PhD Student  
2017.05 – 2017.08 | Redmond, USA [P5]  
Project: create perceptual illusion of mental representation in immersive virtual reality with haptic feedback.

## Columbia University

★ Visual Inference & Computational Neuroscience Group (PI: N. Kriegeskorte) PhD Candidate  
2018.07 – Present | New York, USA [P8][P3][P2][P1][C4][E5]  
Project: infer and visualize representational dynamics and topology across brain and computational models.

Center for Theoretical Neuroscience (PI: N. Qian) Rotation  
2018.08 – 2020.01 | New York, USA [P11][P4][C2]  
Project: study perception with topological representations and biologically plausible neural network models.

Center for Topology of Cancer Evolution and Heterogeneity (PI: R. Rabadan) Rotation  
2018.04 – 2018.06 | New York, USA [E5][E3]  
Project: study germline mutations with attention-based deep learning; high-dimensional topological visualization.

Computational Biology Group of CS (PI: I. Pe'er) Rotation  
2017.06 – 2017.12 | New York, USA [E2]  
Project: identify gait-based biomarkers in Parkinson's patients via wearable devices and machine learning.

## University of Washington

Ubiquitous Computing Lab of CSE and EE (PI: S. Patel) Research Assistant  
2017.03 – 2017.12 | Seattle, USA [pdf](#) [git](#)  
Project: OsteoApp – a smartphone osteoporosis screening app via gyroscope sensor and machine learning.

Institute for Protein Design of BioE & CSE (PI: D. Baker) Research Assistant  
2015.06 – 2017.06 | Seattle, USA [J5]  
Project: algorithmic self-assembly of *de novo* alphabetic protein design into 2d lattice array.

Mathematical Biology and Biophysical Chemistry Lab of AMath (PI: H. Qian) Research Assistant  
2016.06 – 2016.09 | Seattle, USA [pdf](#) [git](#)  
Project: simulation of DNA polymer dynamics and stochastic gene expression of RNA interference.

Vision Neuroscience Lab of Psych (PI: J. Olavarria) Research Assistant  
2014.01 – 2016.06 | Seattle, USA [J6][E1]  
Project: developmental neural plasticity of ocular dominance columns in visual cortex.

## Beijing Institute of Microbiology & Epidemiology

State Key Lab of Pathogen and Biosecurity (PI: Y. Teng) Research Intern  
2014.07 – 2017.06 (remote collab) | Beijing, China [J4][J3][J2][J1]  
Project: model virus epidemic, analyze genomic entropy, mine epigenetic signatures from databases.

## BGI Research

Personalized Genome Group, Human Health Application Lab (Host: H. Cao) Bioinformatics R & D Intern  
2013.07 – 2013.09 | Shenzhen, China [pdf](#) [git](#)  
Project: bioinformatic analysis and literature review on "Autism Genome 10k" project.

Unit of Synthetic Biology (Host: S. Kang) Laboratory Engineering Intern  
2013.07 – 2013.09 | Shenzhen, China [pdf](#)  
Project: design and engineer a synthetic yeast-based cell cycle reporting and regulating system.

# PUBLICATIONS

## Preprints or Manuscripts

- [P11] [Baihan Lin](#), "Constraining implicit space with minimum description length: an unsupervised attention mechanism across neural network layers," *Under review in CVPR*, 2021.
- [P10] [Baihan Lin](#), D. Bouneffouf, and G. Cecchi, "Online learning in iterated prisoner's dilemma to mimic human behavior," *Under review in AAAI*, 2021.
- [P9] [Baihan Lin](#), D. Bouneffouf, and G. Cecchi, "An empirical study of human behavioral agents in bandits, contextual bandits and reinforcement learning," *Under review in AAAI*, 2021.
- [P8] [Baihan Lin](#) and N. Kriegeskorte, "Adaptive geo-topological independence criterion," *Under review in AISTATS*, 2021.
- [P7] [Baihan Lin](#), D. Bouneffouf, and G. Cecchi, "Predicting human decision making in psychological tasks with recurrent neural networks," *Under review in ICASSP*, 2021.
- [P6] [Baihan Lin](#) and X. Zhang, "Speaker diarization as a fully online learning problem in MiniVox," *Under review in ICASSP*, 2021.
- [P5] C. Berger, [Baihan Lin](#), B. Lenggenhager, J. Lanier, and M. Gonzalez-Franco, "Follow your nose: extended arm reach after Pinocchio illusion in virtual reality," *Under review in Nature Scientific Reports*, 2020.
- [P4] [Baihan Lin](#), "Note on approximating MDL in neural networks," *In submission in Neural Computation*, 2020.
- [P3] H. Schuett, J. Diedrichsen, [Baihan Lin](#), A. Kipnis, and N. Kriegeskorte, "Statistical inference on representational geometries," *In preparation*, 2020.
- [P2] H. Schuett, [Baihan Lin](#), J. Diedrichsen, and N. Kriegeskorte, "PyRSA: A Python toolbox for representational similarity analysis," *In preparation*, 2020.
- [P1] [Baihan Lin](#) and N. Kriegeskorte, "Representational geometry of low-level vision in mouse visual cortex," *In preparation*, 2020.

## Peer-Reviewed Journals

- [J6] A. Andelin, Z. Doyle, R. Laing, J. Turecek, [Baihan Lin](#), and J. Olavarria, "Influence of ocular dominance columns and patchy callosal connections on binocularity in lateral striate cortex: long Evans vs. albino rats," *Journal of Comparative Neurology*, vol. 528, no. 4, pp. 650–663, 2020.
- [J5] Z. Chen, M. Johnson, J. Chen, M. Bick, S. Boyken, [Baihan Lin](#), J. De Yoreo, J. Kollman, D. Baker, and F. DiMaio, "Self-assembling 2D Arrays with *de novo* protein building blocks," *Journal of the American Chemical Society*, vol. 141, no. 22, pp. 8891–8895, 2019.
- [J4] Y. Teng, D. Bi, G. Xie, Y. Jin, Y. Huang, [Baihan Lin](#), X. An, D. Feng, and Y. Tong, "Dynamic forecasting of Zika epidemics using Google Trends," *PLOS ONE*, vol. 12, no. 1, p. e0165085, 2017.
- [J3] Y. Teng, D. Bi, G. Xie, Y. Jin, Y. Huang, [Baihan Lin](#), X. An, Y. Tong, and D. Feng, "Model-informed risk assessment for Zika virus outbreaks in the Asia-Pacific regions," *Journal of Infection*, vol. 74, no. 5, pp. 484–491, 2017.
- [J2] Y. Teng, S. Liu, X. Guo, S. Liu, Y. Jin, T. He, D. Bi, P. Zhang, [Baihan Lin](#), X. An, *et al.*, "An integrative analysis reveals a central role of P53 activation via MDM2 in Zika virus infection induced cell death," *Frontiers in Cellular and Infection Microbiology*, vol. 7, p. 327, 2017.
- [J1] Y. Teng, Y. Wang, X. Zhang, W. Liu, H. Fan, H. Yao, [Baihan Lin](#), P. Zhu, *et al.*, "Systematic genome-wide screening and prediction of microRNAs in EBOV during the 2014 Ebolavirus outbreak," *Nature Scientific Reports*, vol. 5, p. 9912, 2015.

## Peer-Reviewed Conference Proceedings

- [C8] [Baihan Lin](#), "Online semi-supervised learning in contextual bandits with episodic reward," in *AJCAI*, (Canberra, Australia), November 2020.
- [C7] [Baihan Lin](#) and X. Zhang, "VoicelD on the fly: a speaker recognition system that learns from scratch," in *INTERSPEECH*, (Shanghai, China), October 2020.
- [C6] [Baihan Lin](#), "Keep it real: a window to real reality in virtual reality," in *IJCAI*, (Yokohama, Japan), July 2020.
- [C5] [Baihan Lin](#), G. Cecchi, D. Bouneffouf, J. Reinen, and I. Rish, "A story of two streams: reinforcement learning models from human behavior and neuropsychiatry," in *AAMAS*, (Auckland, New Zealand), May 2020.
- [C4] [Baihan Lin](#), M. Mur, T. Kietzmann, and N. Kriegeskorte, "Visualizing representational dynamics with multidimensional scaling alignment," in *CCN*, (Berlin, Germany), September 2019.
- [C3] [Baihan Lin](#), D. Bouneffouf, and G. Cecchi, "Split Q learning: reinforcement learning with two-stream rewards," in *IJCAI*, (Macao, China), August 2019.
- [C2] [Baihan Lin](#), "Neural networks as model selection with incremental MDL normalization," in *IJCAI Workshop on Human Brain and Artificial Intelligence (HBAI)*, (Macao, China), August 2019.
- [C1] [Baihan Lin](#), D. Bouneffouf, G. A. Cecchi, and I. Rish, "Contextual bandit with adaptive feature extraction," in *IEEE ICDM Workshop on Data Science and Big Data Analytics (DSBDA)*, (Singapore), November 2018.

## Peer-Reviewed Extended Abstracts

- [E7] [Baihan Lin](#), D. Bouneffouf, and G. Cecchi, “Unified models of human behavioral agents in bandits, contextual bandits, and RL,” in **KDD Workshop on AI for Good Mental Health (GOOD)**, (San Diego, USA), August 2020.
- [E6] [Baihan Lin](#), D. Bouneffouf, J. Reinen, I. Rish, and G. Cecchi, “Reinforcement learning models of human behavior: reward processing in mental disorders,” in **NeurIPS Workshop on Biological and Artificial Reinforcement Learning (BARL)**, (Vancouver, Canada), December 2019.
- [E5] [Baihan Lin](#), R. Rabadan, and N. Kriegeskorte, “What about higher-order cellular complexity? An inquiry with topological simplicial analysis,” in **NeurIPS Workshop on Learning Meaningful Representations of Life (LMRL)**, (Vancouver, Canada), December 2019.
- [E4] [Baihan Lin](#), “Modeling neurological and psychiatric disorders with reward biased Reinforcement Learning Models,” in **TIPS**, (Boston, USA), October 2019.
- [E3] [Baihan Lin](#), “Cliques of single-cell RNA-seq profiles reveal insights into cell ecology during development and differentiation,” in **ISMB**, (Basel, Switzerland), July 2019.
- [E2] A. Bukkittu, [Baihan Lin](#), T. Vu, and I. Pe’er, “Parkinson’s disease digital biomarker discovery with optimized transitions and inferred Markov emissions,” in **RECOMB Conference on Regulatory & Systems Genomics**, (New York, NY), Nov 2017.
- [E1] [Baihan Lin](#), A. Andelin, and J. Olavarria, “Ocular dominance columns in rat visual cortex: a qualitative model to analyze deprivation-induced cortical plasticity,” in **NeuroFutures Conference**, (Seattle, WA), June 2016.

## RESEARCH BY TOPICS

| since | on                        | about  | published                             |
|-------|---------------------------|--|---------------------------------------|
| 2019  | Speech Processing         | speaker diarization, verification, interaction     | [P6][C8][C7]                          |
| 2018  | Deep Learning             | adaptation, normalization, dynamics, attention     | [P11][P4][C4][C2] [C1]                |
| 2018  | Information Theory        | model selection, bottleneck, compression           | [P11][P4][C2]                         |
| 2018  | Representation Learning   | dynamics, topology, neuroimaging, bandit           | [C4][C2]                              |
| 2017  | Reinforcement Learning    | behavioral model, lifelong learning, multi-agent   | [P10][P9][C8][C5][C3][C2][E7][E6][E4] |
| 2017  | Contextual Bandits        | attention, behavioral modeling                     | [P10][P9][P6][C8][C7][C1][E7]         |
| 2017  | Multi-Armed Bandits       | embedding selection, internal attention, routing   | [P10][P9][C1][E7]                     |
| 2017  | Attention Mechanisms      | saliency, routing, model selection, recurrence     | [P11][P4][C2][C1]                     |
| 2017  | Online Learning           | nonstationary setting, semi-supervision            | [P10][P6][C7][C1]                     |
| 2017  | Machine Learning          | classification, feature engineering                | [P6][C7][C2][C1][E2] etc.             |
| 2017  | Topological Data Analysis | mapping, simplicial analysis                       | [P8] [E5][E3]                         |
| 2017  | Statistics                | independence tests, pattern recognition            | [P8]                                  |
| 2017  | Computational Psychiatry  | wireless device, behavioral modeling, e-Health     | [C5][C3][E7][E6][E4][E2]              |
| 2017  | Computer Vision           | virtual/augmented reality, projective geometry     | [P5][C6][E1]                          |
| 2016  | Time-Series Analysis      | epidemic & behavioral modeling, neural dynamics    | [P7][J4][J3][C4][E5] [E3]             |
| 2014  | Vision Neuroscience       | ocular dominance, visual illusion, cognitive model | [P5][J6] [C4] [E1]                    |
| 2014  | Systems Biology           | omics, protein design, single-cell genomics        | [J5][J3][J2][J1][E3]                  |
| 2014  | Image/Signal Processing   | patchiness quantification, gait analysis           | [E2] [E1]                             |

## TEACHING

|             |          |                   |   |                    |
|-------------|----------|-------------------|---|--------------------|
| 2021 Spring | Parsons  | <b>PSAM 5020</b>  | <b>Machine Learning</b>                   | Teaching Assistant |
| 2020 Summer | Columbia | <b>PSYC S1610</b> | <b>Statistics for Behavioral Sciences</b> | Teaching Assistant |
| 2014 Fall   | UW       | <b>PSYCH 202</b>  | <b>Neuropsychology</b>                    | Teaching Assistant |

## REFERENCES

Upon requests, early confidential references (from 2017) can be directly delivered via Interfolio from [Dr. David Baker](#) (UW), [Dr. Hong Qian](#) (UW), [Dr. Jaime Olavarria](#) (UW), [Dr. Henry Yang](#) (BGI), [Dr. Chris Vogl](#) (UW) and [Dr. Rachel Chapman](#) (UW).

For more recent references, please feel free to contact my other recent mentors/collaborators such as [Dr. Guillermo Cecchi](#) (IBM Research), [Dr. Irina Rish](#) (Mila, UdeM), [Dr. Shwetak Patel](#) (UW EECS), [Dr. Mar Gonzalez-Franco](#) (Microsoft Research), [Dr. Djallel Bouneffouf](#) (IBM Research) and [Dr. Niko Kriegeskorte](#) (Columbia).

## ACADEMIC EVENTS

### Conference

|      |   |           |                           |
|------|---|-----------|---------------------------|
| 2020 | Australasian Joint Conference on Artificial Intelligence (AJCAI)  | presenter | Canberra, Australia       |
| 2020 | Conference of International Speech Comm. Assoc. (INTERSPEECH)     | presenter | Shanghai, China           |
| 2020 | International Joint Conference on Artificial Intelligence (IJCAI) | presenter | Yokohama, Japan           |
| 2020 | International Conf. on Knowledge Discovery & Data Mining (KDD)    | presenter | San Diego, USA            |
| 2020 | Autonomous Agents and Multi-Agent Systems (AAMAS)                 | presenter | Auckland, New Zealand     |
| 2019 | Neural Information Processing Systems (NeurIPS)                   | presenter | Vancouver, Canada         |
| 2019 | Technology in Psychiatry Summit (TIPS)                            | presenter | Boston, USA               |
| 2019 | Conference on Cognitive Computational Neuroscience (CCN)          | presenter | Berlin, Germany           |
| 2019 | International Joint Conference on Artificial Intelligence (IJCAI) | presenter | Macao, China              |
| 2019 | Intelligent Systems for Molecular Biology (ISMB)                  | presenter | Basel, Switzerland        |
| 2018 | IEEE International Conference on Data Mining (ICDM)               | presenter | Sentosa Island, Singapore |
| 2018 | Optimization, Complexity and Invariant Theory (OCIT)              | attendee  | Princeton, USA            |
| 2017 | Neural Information Processing Systems (NeurIPS)                   | attendee  | Long Beach, USA           |
| 2017 | RECOMB Conference on Regulatory & Systems Genomics                | presenter | New York, USA             |
| 2017 | BIC Symposium: NeuroImaging Throughout the LifeSpan               | attendee  | New York, USA             |
| 2017 | Genome Engineering 5.0  | attendee  | Cambridge, USA            |
| 2016 | RosettaCON  | attendee  | Leavenworth, USA          |
| 2016 | NeuroFutures Conference   | presenter | Seattle, USA              |
| 2015 | UW Undergraduate Research Symposium                               | presenter | Seattle, USA              |
| 2014 | International Conference on Genomics (ICG)                        | attendee  | Shenzhen, China           |
| 2014 | NeuroFutures Conference   | attendee  | Seattle, USA              |
| 2013 | iGEM World Championship Jamboree                                  | presenter | Cambridge, USA            |
| 2013 | International Conference on Genomics (ICG)                        | attendee  | Sacramento, USA           |

### Invited talks

|      |                        |   |                  |
|------|------------------------|---|------------------|
| 2020 | RL Sofa Seminar @ Mila | "Unified Models of Human Behavioral Agents"           | Montreal, Canada |
| 2019 | RSA 3.0 Seminar @ UWO  | "Representational Dynamics & Topology"                | Toronto, Canada  |
| 2018 | Neuro-AI Seminar @ IBM | "Reward-driven Attention and Attention-driven Reward" | New York, USA    |

### Editorial

|      |                       |                    |                             |                 |
|------|-----------------------|--------------------|-----------------------------|-----------------|
| 2014 | <i>Grey Matters</i>   | Column editor      | Neuroscience magazine in UW | Seattle, USA    |
| 2012 | <i>Nirvana Weekly</i> | Editorial director | Independent media in SZ     | Shenzhen, China |

### Engineering

|      |                         |                  |  |                 |
|------|-------------------------|------------------|--|-----------------|
| 2016 | UW WOOF3D               | Electronics team | design and build the Big Blue 3D printer | Seattle, USA    |
| 2013 | iGEM Shenzhen_BGIC_ATCG | Wet team         | build a cell-cycle reporter & regulator  | Shenzhen, China |
| 2011 | SMS-MIT InvenTeam       | Hardware team    | build a prototype of parking navigator   | Shenzhen, China |

## LEADERSHIP, SERVICE & OUTREACH

### Reviewer / Program Committee

|                  |  |
|------------------|--|
| Journals (2)     | PLOS ONE, Advances in Complex Systems                |
| Conferences (24) | CCN, MICCAI, INTERSPEECH, ISMIR, ICLR, AAAI, AISTATS |
| Workshops (9)    | NeurIPS BARL & ML4H Workshops                        |

### Volunteer

|             |                                    |           |                               |                 |
|-------------|------------------------------------|-----------|-------------------------------|-----------------|
| 2014        | UW Disability Resources            | notetaker | scribe for the disabled       | Seattle, USA    |
| 2011 - 2013 | Shenzhen Children's Hospital       | volunteer | rehab for cerebral palsy kids | Shenzhen, China |
| 2007 - 2012 | SMS Symphonic Band, SFLS Wind Band | flutist   | weekly charity concerts       | Shenzhen, China |

### Science awareness

|             |  |                       |              |
|-------------|--|-----------------------|--------------|
| 2013 - 2015 | <u>UW Students for Evidence-Based Medicine &amp; Policy (SEBMAP)</u> | Cofounder / Secretary | Seattle, USA |
|-------------|--|-----------------------|--------------|

### Mental health support

|             |                     |                   |   |                 |
|-------------|---------------------|-------------------|---|-----------------|
| 2013 - 2014 | UW Residency Hall   | Committee Chair   | "Help Others Help Ourselves" Initiative | Seattle, USA    |
| 2011 - 2013 | Shenzhen Doer Union | Founder/President | "CP Kids' Spring" Initiative            | Shenzhen, China |
| 2011 - 2013 | Shenzhen Peer Union | Mental advisor    | Peer psychological counseling service   | Shenzhen, China |

# CLINICAL EXPERIENCE

## Nanjing Brain Hospital Department of Medical Psychology and Psychiatry

Medical Intern

2013.12 – 2014.01 | Nanjing, China

Supervised by Prof. Na Liu, I made ward round, followed inquiry, psychotherapy, clinical exams and autism studies.

## Dachang Hospital of Nanjing Department of Pathology

Medical Assistant

2013.07 | Nanjing, China

Supervised by Prof. Guoliang Miao, I performed basic HPV genotyping diagnosis and clinical examination tasks.

## University of Washington Department of Anthropology

Independent Study

2011.09 – 2014.06 | Seattle, USA

With Prof. Rachel Chapman on structural vicious spiral of China's patient-doctor relationship in healthcare ([pdf](#)).

# SKILLS

## Computational

|                        | Advanced  | Familiarize                           | Learning   |
|------------------------|---|---------------------------------------|------------|
| <b>Languages:</b>      | MATLAB, Bash, Python, Java  | R, C/C++, Perl, Html, CSS, JavaScript | C#, Swift  |
| <b>Environments:</b>   | Git, Linux, Android, SQL, NOSQL   | BOINC, HPC, AWS, CUDA, MPI, OpenMP    | Node.js    |
| <b>Software:</b>       | PyTorch, Adobe Ps/Id/Ai/Ae  | ImageJ, Cytoscape, Rosetta            | SolidWorks |
| <b>Bioinformatics:</b> | sequencing, genomics, databases   | alignment, entropy analysis           | annotation |
| <b>Mathematics:</b>    | linear algebra, calculus, statistics, probability, scientific computing, ODE, PDE, continuous/discrete modeling, analytical geometry, stochastic dynamics, computational topology, numerical analysis |                                       |            |

## Experimental

|                         |  |
|-------------------------|--|
| <b>Neuroscience:</b>    | electrophys, craniotomy, durotomy, microtome, suture, eye enucleation, IV/intracortical injections |
| <b>Molecular Biol.:</b> | PCR; flow cytometry; staining; culture; electron microscopy; all synthetic biology stuffs...       |
| <b>Biochemistry:</b>    | western blotting, circular dichroism spectroscopy, protein expression, SEC-MALS, SDS-PAGE          |
| <b>Organic Chem.:</b>   | purification/separation, stereochemistry (GC-MS, TLC, NMR), synthesis & identification, pH meter   |

# GITHUB CODES

Note: Industry-related and private repositories are not referenced here.

| since   | at              | for                              | type     | language            | more  | note              |
|---------|-----------------|----------------------------------|----------|---------------------|---|-------------------|
| 2020.08 | ePsych @ IBM    | HumanLSTM                        | original | Python              | <a href="#">repo</a> <a href="#">arXiv</a>                      |                   |
| 2020.04 | ePsych @ IBM    | ★ dilemmaRL                      | original | Python/Bash         | <a href="#">repo</a> <a href="#">arXiv</a>                      |                   |
| 2020.01 | my own interest | ★ V2R: Virtual-to-Real Mirror    | original | Python              | <a href="#">repo</a> <a href="#">arXiv</a>                      | IJCAI 2020        |
| 2020.01 | my own interest | ★ MiniVox                        | original | Matlab              | <a href="#">repo</a> <a href="#">arXiv</a> <a href="#">demo</a> | INTERSPEECH 2020  |
| 2019.12 | my own interest | ★ BerlinUCB                      | original | Matlab              | <a href="#">repo</a> <a href="#">arXiv</a>                      | AJCAI 2020        |
| 2019.10 | NKLab @ CU      | ★ PyRSA                          | group    | Python              | <a href="#">repo</a> <a href="#">arXiv</a> <a href="#">doc</a>  | CCN 2019          |
| 2019.02 | my own interest | ★ UnsupervisedAttentionMechanism | original | Python              | <a href="#">repo</a> <a href="#">arXiv</a>                      | HBAI 2019         |
| 2018.09 | ePsych @ IBM    | ★ mentalRL                       | original | Python/Bash         | <a href="#">repo</a> <a href="#">arXiv</a> <a href="#">demo</a> | AAMAS 2020        |
| 2018.06 | RRLab @ CU      | SequenceAttentionClassifier      | original | Python/Bash         | <a href="#">repo</a> <a href="#">doc</a>                        |                   |
| 2018.04 | NKLab @ CU      | ★ AGTIC                          | original | Matlab              | <a href="#">repo</a> <a href="#">arXiv</a>                      |                   |
| 2018.04 | RRLab @ CU      | scTSA                            | original | Matlab/Java/Bash    | <a href="#">repo</a> <a href="#">doc</a>                        | ISMB 2019         |
| 2017.12 | ePsych @ IBM    | ★ ABaCoDE                        | original | Matlab              | <a href="#">repo</a> <a href="#">arXiv</a>                      | ICDMW 2018        |
| 2017.03 | UbiComp @ UW    | OsteoApp                         | original | Bash/Python/Matlab  | <a href="#">repo</a> <a href="#">doc</a>                        |                   |
| 2016.11 | HQLab @ UW      | RNAi_CME_dynamics                | original | Matlab              | <a href="#">repo</a> <a href="#">doc</a>                        |                   |
| 2016.07 | JOLab @ UW      | Quanti_Patch                     | original | Java                | <a href="#">repo</a> <a href="#">doc</a>                        | J. Comp. Neurol.  |
| 2016.07 | HQLab @ UW      | GRN                              | original | R/Matlab            | <a href="#">repo</a>  |                   |
| 2016.07 | HQLab @ UW      | DNA_dynamics                     | original | Matlab              | <a href="#">repo</a>  |                   |
| 2016.04 | DBLab @ UW      | self_assembly_scripts            | original | Bash/Python/C/Perl  | <a href="#">repo</a>  | J. Am. Chem. Soc. |
| 2016.04 | JOLab @ UW      | IntanEphys                       | original | Matlab              | <a href="#">repo</a> <a href="#">doc</a>                        |                   |
| 2016.04 | my own interest | doerbeta.github.io               | original | Html/CSS/JavaScript | <a href="#">repo</a> <a href="#">demo</a>                       |                   |
| 2016.04 | YTLab @ BIME    | Ebola_GUI_SL                     | original | Matlab/R            | <a href="#">repo</a>  |                   |
| 2016.03 | my own interest | Ebola_bat_model                  | original | Matlab              | <a href="#">repo</a> <a href="#">doc</a>                        |                   |
| 2016.03 | WOOF3D @ UW     | Big_Blue_3DPrinter               | modify   | C                   | <a href="#">repo</a> <a href="#">doc</a>                        |                   |
| 2015.12 | DBLab @ UW      | bc_wc2dm                         | original | Java                | <a href="#">repo</a>  |                   |
| 2015.11 | DBLab @ UW      | bp_solver                        | original | Java                | <a href="#">repo</a>  |                   |
| 2015.11 | DBLab @ UW      | bp_creator                       | original | Java                | <a href="#">repo</a>  |                   |
| 2015.10 | DBLab @ UW      | ABEGO_solver                     | original | Java/Perl           | <a href="#">repo</a>  |                   |
| 2014.08 | YTLab @ BIME    | Matrix_solver                    | original | Java                | <a href="#">repo</a>  |                   |
| 2014.06 | JOLab @ UW      | ★ Patch_Processor_2.0            | original | Java                | <a href="#">repo</a> <a href="#">doc</a> <a href="#">demo</a>   | NeuroFutures 2016 |
| 2014.02 | CompNeuro @ UW  | Neuronal_RC_HH_model             | original | Matlab              | <a href="#">repo</a> <a href="#">doc</a>                        |                   |
| 2014.01 | CompNeuro @ UW  | Neuron_tuning_curve              | original | Matlab              | <a href="#">repo</a> <a href="#">doc</a>                        |                   |
| 2013.09 | HHAL @ BGI      | Autism_Genomics_QC_adapter       | modify   | Perl                | <a href="#">repo</a>  |                   |
| 2013.08 | HHAL @ BGI      | Autism_Genomics_QC_NACTG_stat    | original | Perl                | <a href="#">repo</a>  |                   |