22,

# Baihan Lin

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Computational Neuroscience • Computational Geometry • Deep Learning • Biomathematics • Genomics • Psychology • HCI

### **EDUCATION**

#### Columbia University (CU)

Zuckerman Mind Brain Behavior Institute, CU Medical Center | M.Phil. | Computational Systems Biology

2017.09 - 2022.06 (expected) | New York, USA

### University of Washington (UW)

**Department of Applied Mathematics** 2017.09 - 2020.06 | Seattle, USA

NIH Computational Neuroscience Training Program

2013.09 - 2017.06 | Seattle, USA

Ph.D. Computational Neuroscience

50,

M.A. Cellular & Molecular Biomedical Studies 19'

#### M.S. Applied Mathematics 20'

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-)

#### **Systems Biology**

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

#### **Computer Science**

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

### F

Fellowships			
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**

iGEM 2013 (Gold); MIT EurekaFest 2011 (Merit) Engineering:

WCA-Math 2009 (2nd); NChemO 2011 (3rd); NChemO 2011, NBioO 2011, NOInfo 2009 (GD 2nd) Olympiads:

### **RESEARCH**

#### Independent projects

On bandits/RL [C8], topology [E3], audio [P6][C7], computer vision [C6] and information theory [P9][P4][C2].

#### **IBM Research**

E-Psychiatry (Host: <u>G. Cecchi</u>); Al Foundations (Host: <u>I. Rish</u>, <u>D. Bouneffouf</u>)

PhD Research Intern

2017/2018/2019/2020.07 - .09 | Yorktown Heights, USA

[P11][P10][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

[P9][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] <u>Baihan Lin</u>, D. Bouneffouf, and G. Cecchi, "Online learning in iterated prisoner's dilemma to mimic human behavior," *Under review in AAAI*, 2021.
- [P10] <u>Baihan Lin</u>, D. Bouneffouf, and G. Cecchi, "An empirical study of human behavioral agents in bandits, contextual bandits and reinforcement learning," *Under review in AAAI*, 2021.
- [P9] <u>Baihan Lin</u>, "Constraining implicit space with minimum description length: an unsupervised attention mechanism across neural network layers," *Under review in AAAI*, 2021.
- [P8] Baihan Lin and N. Kriegeskorte, "Adaptive geo-topological independence criterion," *Under review in AISTATS*, 2021.
- [P7] <u>Baihan Lin</u>, D. Bouneffouf, and G. Cecchi, "Predicting human decision making in psychological tasks with recurrent neural networks," *Under review in ICASSP*, 2021.
- [P6] <u>Baihan Lin</u> and X. Zhang, "Speaker diarization as a fully online learning problem in MiniVox," *Under review in ICASSP*, 2021.
- [P5] C. Berger, <u>Baihan Lin</u>, 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, <u>Baihan Lin</u>, A. Kipnis, and N. Kriegeskorte, "Statistical inference on representational geometries," *In preparation*, 2020.
- [P2] H. Schuett, <u>Baihan Lin</u>, J. Diedrichsen, and N. Kriegeskorte, "PyRSA: A Python toolbox for representational similarity analysis," *In preparation*, 2020.
- [P1] <u>Baihan Lin</u> 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, <u>Baihan Lin</u>, 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, <u>Baihan Lin</u>, 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, <u>Baihan Lin</u>, 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, <u>Baihan Lin</u>, 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, <u>Baihan Lin</u>, 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, <u>Baihan Lin</u>, 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] <u>Baihan Lin</u>, "Online semi-supervised learning in contextual bandits with episodic reward," in **AJCAI**, (Canberra, Australia), November 2020.
- [C7] <u>Baihan Lin</u> and X. Zhang, "VoiceID 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] <u>Baihan Lin</u>, 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] <u>Baihan Lin</u>, M. Mur, T. Kietzmann, and N. Kriegeskorte, "Visualizing representational dynamics with multidimensional scaling alignment," in *CCN*, (Berlin, Germany), September 2019.
- [C3] <u>Baihan Lin</u>, D. Bouneffouf, and G. Cecchi, "Split Q learning: reinforcement learning with two-stream rewards," in *IJCAI*, (Macao, China), August 2019.
- [C2] <u>Baihan Lin</u>, "Neural networks as model selection with incremental MDL normalization," in *IJCAI* Workshop on Human Brain and Artificial Intelligence (HBAI), (Macao, China), August 2019.
- [C1] <u>Baihan Lin</u>, 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] <u>Baihan Lin</u>, D. Bouneffouf, and G. Cecchi, "Unified models of human behavioral agents in bandits, contextual bandits, and RL," in **KDD** Workshop on Al for Good Mental Health (GOOD), (San Diego, USA), August 2020.
- [E6] <u>Baihan Lin</u>, 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] <u>Baihan Lin</u>, 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] <u>Baihan Lin</u>, "Modeling neurological and psychiatric disorders with reward biased Reinforcement Learning Models," in *TIPS*, (Boston, USA), October 2019.
- [E3] <u>Baihan Lin</u>, "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, <u>Baihan Lin</u>, 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] <u>Baihan Lin</u>, 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
2018	Deep Learning	adaptation, normalization, dynamics, attention	[P9][P4][C4][C2][C1]
2018	Information Theory	model selection, bottleneck, compression	[P9][P4][C2]
2018	Representation Learning	dynamics, topology, neuroimaging, bandit	[C4][C2]
2017	Reinforcement Learning	behavioral model, lifelong learning, multi-agent	[P11][P10][C8][C5][C3][C2][E7][E6][E4]
2017	Contextual Bandits	attention, behavioral modeling	[P11][P10][P6][C8][C7][C1][E7]
2017	Multi-Armed Bandits	embedding selection, internal attention, routing	[P11][P10][C1][E7]
2017	Attention Mechanisms	saliency, routing, model selection, recurrence	[P9][P4][C2][C1]
2017	Online Learning	nonstationary setting, semi-supervision	[P11][P6][C7][C1]
2017	Machine Learning	classification, feature engineering	[P6][C7][C2][C1][E2]
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**

PSYCH 202: NeuroPsychology (Fall 2014 at UW)
PSYC S1610: Statistics for Behavioral Sciences (Summer 2020 at Columbia)

Teaching Assistant Teaching Assistant

### REFERENCES

 $\label{eq:confidential} \ \, \text{Upon requests, early confidential references (from 2017) can be directly delivered via Interfolio from $\underline{\textbf{Dr. David Baker}}$ (UW), $\underline{\textbf{Dr. Henry Yang}}$ (BGI), $\underline{\textbf{Dr. Chris VogI}}$ (UW) and $\underline{\textbf{Dr. Rachel Chapman}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (BGI), $\underline{\textbf{Dr. Chris VogI}}$ (UW) and $\underline{\textbf{Dr. Rachel Chapman}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW) and $\underline{\textbf{Dr. Rachel Chapman}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW) and $\underline{\textbf{Dr. Rachel Chapman}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW) and $\underline{\textbf{Dr. Rachel Chapman}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW) and $\underline{\textbf{Dr. Rachel Chapman}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW) and $\underline{\textbf{Dr. Rachel Chapman}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW) and $\underline{\textbf{Dr. Rachel Chapman}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$ (UW). $\underline{\textbf{Dr. Henry Yang}}$$ 

For more recent references, please feel free to contact my other recent mentors/collaborators such as <u>Dr. Guillermo Cecchi</u> (IBM Research), <u>Dr. Irina Rish</u> (Mila, UdeM), <u>Dr. Shwetak Patel</u> (UW EECS), <u>Dr. Mar Gonzalez-Franco</u> (Microsoft Research), <u>Dr. Djallel Bouneffouf</u> (IBM Research) and <u>Dr. Niko Kriegeskorte</u> (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
2014	International Conference on Genomics (ICG)	attendee	Shenzhen, China
2014	NeuroFutures Conference	attendee	Seattle, 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-Al Seminar @ IBM	"Reward-driven Attention and Attention-driven Reward"	New York, USA

#### **Editorial**

2014	Grey Matters	Column editor	Neuroscience magazine in UW	Seattle, USA
2012	Nirvana Weekly	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 reportor & 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 (20) 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 UW Students for Evidence-Based Medicine & Policy (SEBMAP) 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	
Languages:	MATLAB, Bash, Python, Java	R, C/C++, Perl, Html, CSS, JavaScript	C#, Swift	
<b>Environments:</b>	Win, macOS, Git, Linux, Android	BOINC, HPC, AWS, CUDA, MPI, OpenMP	Node.js	
Software:	Office, PyTorch	PhotoShop, ImageJ, Cytoscape, Rosetta	SolidWorks, Geneious	
Bioinformatics:	sequencing, genomics, databases alignment, entropy analysis		genome annotation	
Mathematics:	linear algebra, calculus, statistics, probability, scientific computing, ODE, PDE, continuous/discrete			
	modeling, analytical geometry, stochastic dynamics, computational topology, numerical analysis			

### **Experimental**

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

### **GITHUB CODES**

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

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since	at	for	type	language	more	note
2020.04	ePsych@IBM	★ dilemmaRL	original	Matlab	repo <u>arXiv</u>	
2020.01	my own interest	★ V2R: Virtual-to-Real Mirror	original	Python	repo <u>arXiv</u>	IJCAI 2020
2020.01	my own interest	★ MiniVox	original	Matlab	repo <u>arXiv demo</u>	INTERSPEECH 2020
2019.12	my own interest	★ BerlinUCB	original	Matlab	repo <u>arXiv</u>	AJCAI 2020
2019.10	NKLab @ CU	★ PyRSA	group	Python	repo <u>arXiv doc</u>	CCN 2019
2019.02	my own interest	★ UnsupervisedAttentionMechanism	original	Python	<u>repo arXiv</u>	HBAI 2019
2018.09	ePsych @ IBM	★ mentalRL	original	Python/Bash	repo <u>arXiv demo</u>	AAMAS 2020
2018.06	RRLab @ CU	SequenceAttentionClassifier	original	Python/Bash	repo <u>doc</u>	
2018.04	NKLab @ CU	★ AGTIC	original	Matlab	repo <u>arXiv</u>	
2018.04	RRLab @ CU	scTSA	original	Matlab/Java/Bash	repo <u>doc</u>	
2017.12	ePsych @ IBM	★ ABaCoDE	original	Matlab	repo <u>arXiv</u>	ICDMW 2018
2017.03	UbiComp@UW	OsteoApp	original	Bash/Python/Matlab	repo <u>doc</u>	
2016.11	HQLab @ UW	RNAi_CME_dynamics	original	Matlab	repo <u>doc</u>	
2016.07	JOLab @ UW	Quanti_Patch	original	Java	repo <u>doc</u>	J. Comp. Neurol.
2016.07	HQLab @ UW	GRN	original	R/Matlab	repo	
2016.07	HQLab @ UW	DNA dynamics	original	Matlab	repo	
2016.04	DBLab @ UW	self assembly scripts	original	Bash/Python/C/Perl	repo	J. Am. Chem. Soc.
2016.04	JOLab @ UW	IntanEphys	original	Matlab	repo <u>doc</u>	
2016.04	my own interest	doerbeta.github.io	original	Html/CSS/JavaScript	repo demo	
2016.04	YTLab@BIME	Ebola GUI SL	original	Matlab/R	repo	
2016.03	my own interest	Ebola bat model	original	Matlab	repo doc	
2016.03	WOOF3D@UW	Big_Blue_3DPrinter	modify	С	repo doc	
2015.12	DBLab@UW	bc wc2dm	original	Java	repo	
2015.11	DBLab @ UW	bp solver	original	Java	repo	
2015.11	DBLab @ UW	bp creator	original	Java	repo	
2015.10	DBLab @ UW	ABEGO solver	original	Java/Perl	repo	
2014.08	YTLab @ BIME	Matrix solver	original	Java	repo	
2014.06	JOLab @ UW	★ Patch Processor 2.0	original	Java	repo doc demo	NeuroFutures 2016
2014.02	CompNeuro@UW	Neuronal RC HH model	original	Matlab	repo doc	
2014.01	CompNeuro @ UW	Neuron tuning curve	original	Matlab	repo doc	
2013.09	HHAL@BGI	Autism Genomics QC adapter	modify	Perl	repo doc	
2013.08	HHAL@BGI	Autism Genomics QC NACTG stat	original	Perl	repo	
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