

Joanna C. Chang

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Education

Imperial College London | London, UK
PHD, COMPUTATIONAL NEUROSCIENCE

Oct 2020 - exp. Oct 2024

Imperial College London | London, UK
MSC, BIOINFORMATICS AND THEORETICAL SYSTEMS BIOLOGY

Sep 2019 - Sep 2020

Distinction (81%), Top Student in Cohort

Pomona College | Claremont, CA, US
BA BIOLOGY, MINOR IN COMPUTER SCIENCE

Aug 2015 - May 2019

Summa Cum Laude (GPA: 3.99/4.0)

Professional & Research Experience

Imperial College London
PHD CANDIDATE | SUPERVISOR: PROF. CLAUDIA CLOPATH, DR. JUAN GALLEGO

Oct 2020 - present

- Modeling motor cortical neural population activity during motor learning and adaptation using recurrent neural networks
- Building a subcortical brain-computer interface that uses activity from basal ganglia to control skilled movements in mice

Synthace
DATA ANALYST

Aug 2020 - Dec 2020

- Analyzed data to assess engagement and program needs for company's Computer-Aided Biology community sector

Imperial College London
POSTGRADUATE RESEARCHER

Jan 2020 - Sep 2020

Thesis | Supervisor: Dr. Tobias Reichenbach

- Developed mathematical and computational models to examine the frequency selectivity of the inner ear through a travelling wave on the basilar membrane

Data Analysis Project | Supervisor: Dr. Myrsini Kaforou

- Analyzed circular RNA expression in pediatric tuberculosis to identify potential diagnostic biomarkers

Computing Project | Supervisors: Dr. Alessia David, Prof. Michael Sternberg

- Visualized and integrated gene pathway, protein-protein interaction, and gene expression data within networks to aid disease detection for protein variants

Harvey Mudd College

Apr 2017 - Nov 2019

COMPUTATIONAL BIOLOGY RESEARCH ASSISTANT | SUPERVISOR: DR. MATINA DONALDSON-MATASCI

- Examined ant nest network formation under spatial constraints with laboratory experiments and agent-based modelling

Middle Tree

Jan 2019 - May 2019

SOFTWARE DEVELOPMENT INTERN

- Developed back-end to facilitate customer registration and record data into customer management systems

Pomona College

Sep 2016 - May 2017

ECOLOGY RESEARCH ASSISTANT | SUPERVISORS: PROF. WALLACE MEYER

- Examined carbon and nitrogen storage in native and non-native Californian habitats

Tufts University

May 2016 - Aug 2016

ECOLOGY RESEARCH ASSISTANT | SUPERVISORS: DR. PHIL STARKS, DR. RACHAEL BONOAN

- Examined the effects of essential amino acids on social immunity and foraging behavior in honeybees
- Utilized thermal imaging programs to track colony-level fever

Publications

* *equal contribution*; † *equal supervision*

Safaie M*, **Chang JC***, Park J, Miller LE, Dudman J, Perich MG†, Gallego JA†. 2022. Preserved neural dynamics across animals performing similar behaviour. *Nature*.

Chang JC, Perich MG, Miller LE, Gallego JA†, Clopath C†. 2023. De novo motor learning creates structure in neural activity space that shapes adaptation. *bioRxiv*.

Fortunato C, Bennasar-Vázquez J, Park J, **Chang JC**, Miller LE, Dudman JT, Perich MG, Gallego JA. 2023. Nonlinear manifolds underlie neural population activity during behaviour. *bioRxiv*.

Love K, Cao D, **Chang J**, Dal'ello LR, Ma X, O'Shea DJ, Schone HR, Shahbazi M, Smoulder A. 2023. Highlights from the 32nd Annual Meeting of the Society for the Neural Control of Movement. *Journal of Neurophysiology*.

Chang J, Powell S, Robinson E, Donaldson-Matasci M. 2021. Nest choice in arboreal ants is an emergent consequence of network creation under spatial constraints. *Swarm Intelligence*

Bonoan RE, Iglesias Feliciano PM, **Chang J**, Starks PT. 2020. Social benefits require a community: the influence of colony size on behavioral immunity in honey bees. *Apidologie*.

Presentations

TALKS

2023	Mila Neuro-AI Reading Group	online for Quebec, Canada
	Bernstein Conference	Berlin, Germany
	Neural Control of Movement Conference	Victoria, Canada
	COSYNE Conference	Montreal, Canada
2020	Synthace Computer-Aided Biology Community, <i>Invited by Dr. Fane Mensah</i>	London, UK
2018	University of Lausanne, <i>Invited by Prof. Laurent Keller</i>	Lausanne, Switzerland

POSTERS

2023	Bernstein Conference	Berlin, Germany
	COSYNE Conference	Montreal, Canada
2022	Society for Neuroscience (SFN) Conference	San Diego, US
	Neural Control of Movement Conference	Dublin, Ireland
	COSYNE Conference	Lisbon, Portugal
2018	SACNAS Conference for Diversity in STEM, <i>Travel grant</i>	San Antonio, TX, US
	International Union for the Study of Social Insects Conference	São Paulo, Brazil

Awards & Fellowships

2023	Neural Control of Movement (NCM) Scholarship	
2020	Eurofins Foundation Postgraduate Prize, <i>for top student in MSc course</i>	£ 500
	Wellcome Trust 4-Year PhD Studentship	
2019	University of Edinburgh Biological Sciences Postgraduate Bursary, <i>declined offer</i>	€ 10,000
	Bessie Reiner Dill Award	\$ 10,000
	Sherwood Heiser Fellowship	\$ 5,000
	Phi Beta Kappa Honor Society Award	\$ 2,000
2018	Harvey Mudd Summer Research Fellowship	
	Rose Hills Foundation Scholarship	\$ 17,000
2017	Howard Hughes Medical Institute Undergraduate Research Fellowship	
	Edison STEM Scholarship	\$ 3,000
	Robinson Scholarship	\$ 20,000

2016	NSF Research Experience for Undergraduates Fellowship	
	Brown Scholarship	\$ 16,000
	Steele Foundation Scholarship	\$ 11,000
2014	California Institute of Technology Summer Research Connection Fellowship	

Teaching Experience

2023	Computational Neuroscience	<i>Imperial College London</i>
2022	Computational Neuroscience	<i>Imperial College London</i>
2021	Programming II	<i>Imperial College London</i>
2020	Probability and Statistics	<i>Imperial College London</i>
2019	Biochemistry with Lab	<i>Pomona College</i>
2018	Biochemistry with Lab	<i>Pomona College</i>
2017	Genetics	<i>Pomona College</i>
	General Chemistry II	<i>Pomona College</i>
2016	General Chemistry I	<i>Pomona College</i>

Service & Outreach

Imperial College London Outreach

Nov 2019 - present

STEM AMBASSADOR

- Lead design and prototyping workshops in the university's Makerspace
- Demonstrate software and equipment use for technologies including 3D printing, laser cutting, and CAD

Tech for Good

Jan 2019 - May 2019

COORDINATOR

- Recruited and oversaw teams on 3 coding projects that emphasized using technology for social good
- Cleaned and analyzed survey data through a partnership with ActiveSGV, a public health non-profit

Quantitative Skills Center

Jan 2017 - Dec 2018

FELLOW

- Provided individual mentoring partnerships for biology, chemistry, and computer science courses

MENTORING

- 2022-23 Alvaro Fernandez-Moris, MEng, Imperial College London
- 2021-22 Ciara Gibbs, MEng, Imperial College London
- 2021 Mireia Munoz Rojo, BSc, Imperial College London

PEER REVIEW

Reviewed for: Current Biology | Nature Neuroscience | Proceedings of the National Academy of Sciences (PNAS)