

# Ankur Sinha

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## GENERAL INFORMATION

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github.com/sanjayankur31  
Nationality: Indian.

Research Fellow at the Silver Lab,  
University College London,  
London, United Kingdom.

## EXPERIENCE

### RESEARCH

- March 2020–: Research Fellow at the [Silver Lab](#) at University College London, London.
- March 2020–: core member of the [NeuroML](#) and [Open Source Brain](#) development teams.
  - 2022–2025: elected member of NeuroML editorial board.
- 2020–: co-chair of the [INCF/OCNS Software Working Group](#).
- 2020: member of the Organising Committee for [CNS 2020 Online](#).

### SERVICE AND VOLUNTEERING

- 2019–2021, 2024–: on the Board of Directors of the [Organization for Computational Neuroscience](#)
- 2023–: lead member of UCL Biosciences mentoring programme
- 2022–: SilverLab weekly meeting and journal club organiser.
- 2020, 2022–: [Google Summer of Code](#) co-mentor (INCF)
- 2022–: [Outreachy](#) co-mentor (ModECI)
- 2018–: core team member of the [NeuroFedora](#) initiative.
- 2008–: volunteer at the Free and Open Source Software [Fedora Linux](#) project:
  - [software package maintainer](#); also sponsor to the package maintainers team, “[proven packager](#)” with permissions to aid other package maintainers with their tasks.
  - member of [Join Special Interest Group](#), focussed on on-boarding of new community members.
  - 2021–2022: [Outreachy](#) mentor for NeuroFedora packaging project.
  - 2020, 2021: Fedora track reviewer for [Devconf.cz](#).

### TEACHING

- March 2020: Department of Neuroscience, Physiology, and Pharmacology
  - Practicals/Lab work: computational neuroscience
- January 2015–September 2020: visiting lecturer at the School of Physics, Engineering, and Computer Science, University of Hertfordshire.
  - Lecturing/Tutorials/Practicals/Lab work/Grading: Artificial Intelligence, Machine Learning, Databases, Contemporary issues, Algorithms and data structures.
  - Project supervision: on-campus and online undergraduate, post-graduate projects.

## INDUSTRY

- June 2011–June 2012: Business Technology Analyst (BTA) at Deloitte Consulting India Pvt. Limited.
- 2011: [Google Summer of Code](#): granted stipend by Google to work on the [Fedora Medical](#) project.

## EDUCATION

OCTOBER 2014–2020

- Doctor of Philosophy (PhD):
  - Structural plasticity and associative memory in balanced neural networks with spike time dependent inhibitory plasticity: computational modelling of homeostatic structural plasticity and homeostatic inhibitory synaptic plasticity to investigate mechanisms underlying the restoration of activity to deafferented neurons, and the effects of network rewiring on associative memories stored in the network.
  - Supervisors: [Professor Volker Steuber](#) (primary), Dr Christoph Metzner, Professor Roderick Adams, Dr Neil Davey, Professor Michael Schmuker.
  - Examiners: [Professor Thomas Nowotny](#) (external); Dr Reinoud Maex (internal)
  - [UH Biocomputation group](#), School of Physics, Engineering, and Computer Science, University of Hertfordshire, Hatfield, UK.
  - Funded by a PhD scholarship provided by the University of Hertfordshire.

JULY 2012–JUNE 2014:

- Master of Engineering (research) (ME):
  - Biomimetic navigation in robots: computational modelling of head direction and grid cells for use in navigation of robots running the ROS platform.
  - Supervisor: [Dr Jack Wang](#).
  - Faculty of Engineering and Information Technology (FEIT), University of Technology, Sydney.

JULY 2007–JUNE 2011:

- Bachelor of Engineering (BE) (GPA: 8.67):
  - Computer Science & Engineering.
  - Manipal University, India

## RESEARCH

PROFILE

- Interests: structural, synaptic, homeostatic plasticity; excitatory-inhibitory balance; associative memory, cerebellar processing; tools, software, and, standardisation for neuroscience research.

## JOURNAL PAPERS

- **Ankur Sinha**, Pdraig Gleeson, Bóris Marin, Salvador Dura-Bernal, Sotirios Panagiotou, Sharon Crook, Matteo Cantarelli, Robert C. Cannon, Andrew P. Davison, Harsha Gurnani, and R. Angus Silver. "The NeuroML ecosystem for standardized multi-scale modeling in neuroscience". In: *bioRxiv* (2023). DOI: 10.1101/2023.12.07.570537. eprint: <https://www.biorxiv.org/content/early/2023/12/11/2023.12.07.570537.full.pdf>. URL: <https://www.biorxiv.org/content/early/2023/12/11/2023.12.07.570537> (in review)
- **Ankur Sinha**, Christoph Metzner, Neil Davey, Roderick Adams, Michael Schmuker, and Volker Steuber. "Growth rules for the repair of Asynchronous Irregular neuronal networks after peripheral lesions". In: *PLOS Computational Biology* 17.6 (2021), pp. 1–35. DOI: 10.1371/journal.pcbi.1008996

## ACCEPTED ORAL PRESENTATIONS

- CNS 2021: Software showcase: CompNeuroFedora - a community-developed Free/Open Source Operating System for computational neuroscience.
- University of Hertfordshire Engineering and Computer Science Conference, 2019: **Ankur Sinha**. *Investigating activity dependent dynamics of synaptic structures using biologically plausible models of post-deafferentation network repair*. 2019. DOI: 10.18745/PB.21692. URL: <https://uhra.herts.ac.uk/handle/2299/21692>

## INVITED ORAL PRESENTATIONS

- 2024: University of Hertfordshire, Computer Science research colloquium

## CONFERENCE POSTERS

- CNS 2022: **Ankur Sinha**, Christoph Metzner, Neil Davey, Rod Adams, Michael Schmuker, and Volker Steuber. "Homeostatic structural and synaptic plasticity both contribute to the repair of peripherally-lesioned balanced networks". In: *Journal of Computational Neuroscience* 51.1 (2023), pp. 3–101. ISSN: 1573-6873. DOI: 10.1007/s10827-022-00841-9. URL: <https://doi.org/10.1007/s10827-022-00841-9>
- CNS 2021: **Ankur Sinha**, Matteo Cantarelli, Salvador Dura-Bernal, Filippo Ledda, Zoran Sinnema, Angus Silver, and Pdraig Gleeson. "Open Source Brain v2.0: Closing the loop between experimental neuroscience data and computational models". In: *Journal of Computational Neuroscience* 49.SUPPL 1, 1, SI (2021), S75–S76. ISSN: 0929-5313
- Neuroinformatics 2021: **Ankur Sinha**, Shailesh Appukuttan, Stewart Heitmann, Caglar Cakan, Nikola Jajcay, Christoph Metzner, Felix B. Kern, Zohreh Vaziri, Amelie Aussel, Brent Huisman, et al. "INCF/OCNS Software Working Group". In: *Proceedings of INCF Neuroinformatics, 2021* (2021). URL: <https://neuroinformatics.incf.org/node/269>
- Neuroinformatics 2021: **Ankur Sinha**, Aniket Pradhan, Sergio Pascual, Antonio Trande, Alessio Ciregia, Josh Santos, Alberto Rodríguez Sánchez, Luis Bazan, Igor Raits, Christian Kellner, Morgan Hough, Zbigniew Jędrzejewski-Szmek, and Iztok Fister Jr. "NeuroFedora: a ready to use Free/Open Source platform for Neuroscientists". In: *Proceedings of INCF Neuroinformatics, 2021* (2021). URL: <https://neuroinformatics.incf.org/node/268>

- **CNS 2020: Ankur Sinha**, Aniket Pradhan, Qianqian Fang, Danny Lee, Danishka Navin, Alberto Rodriguez Sanchez, Luis Bazan, Luis M. Segundo, Alessio Ciregia, Zbigniew Jędrzejewski-Szmek, Sergio Pascual, Antonio Trande, Victor Manuel Tejada Yau, and Morgan Hough. “Comp-NeuroFedora, a Free/Open Source operating system for computational neuroscience: download, install, research”. English. In: *BMC Neuroscience* 21 (2020). ISSN: 1471-2202. URL: <https://labs.fedoraproject.org/comp-neuro>
- **CNS 2020: Ankur Sinha**, Christoph Metzner, Roderick Adams, Neil Davey, Michael Schmuker, and Volker Steuber. “Associative memory performance in peripherally-lesioned networks repaired by homeostatic structural plasticity”. English. In: *BMC Neuroscience* 21 (Dec. 2020). 29th Annual Computational Neuroscience Meeting: CNS\*2020 ; Conference year: 18-07-2020 Through 22-07-2020. ISSN: 1471-2202. DOI: [10.1186/s12868-020-00593-1](https://doi.org/10.1186/s12868-020-00593-1)
- **CNS 2019: Ankur Sinha**, Luis Bazan, Luis M. Segundo, Zbigniew Jędrzejewski-Szmek, Christian J. Kellner, Sergio Pascual, Antonio Trande, Manas Mangaonkar, Tereza Hlaváčková, Morgan Hough, Ilya Gradina, and Igor Gnatenko. “NeuroFedora: a ready to use Free/Open Source platform for Neuroscientists”. In: *BMC Neuroscience* 20 (2019). ISSN: 1471-2202. URL: <https://neuro.fedoraproject.org>
- **CNS 2019: Ankur Sinha**, Christoph Metzner, Neil Davey, Roderick Adams, Michael Schmuker, and Volker Steuber. “Growth rules for repair of asynchronous irregular network models following peripheral lesions”. In: *BMC Neuroscience* 20 (2019). ISSN: 1471-2202
- **CNS 2018: Ankur Sinha**, Christoph Metzner, Roderick Adams, Neil Davey, Michael Schmuker, and Volker Steuber. “The combined effect of homeostatic structural and inhibitory synaptic plasticity during the repair of balanced networks following deafferentation”. In: *BMC Neuroscience* 19.2 (2018), pp. 129–130. ISSN: 1471-2202. DOI: [10.1186/s12868-018-0451-y](https://doi.org/10.1186/s12868-018-0451-y)
- **CNS 2017: Ankur Sinha**, C. Metzner, R. Adams, M. Schmuker, N. Davey, and V. Steuber. “The effect of homeostatic structural plasticity on associative memory in a network with spike-time dependent inhibitory synaptic plasticity.” In: *BMC Neuroscience*, 18(Suppl.1). 2017. DOI: [10.1186/s12868-017-0370-3](https://doi.org/10.1186/s12868-017-0370-3)
- **CNS 2015: Ankur Sinha**, Neil Davey, Rod Adams, and Volker Steuber. “Structural plasticity and associative memory in balanced neural networks with spike-time dependent inhibitory plasticity”. In: *BMC Neuroscience* 16.1 (2015), p. 1. URL: <http://www.biomedcentral.com/1471-2202/16/S1/P235>

#### CONFERENCE PAPERS

- **Ankur Sinha** and Jack Wang. “An implementation of the path integrator mechanism of head direction cells for bio-mimetic navigation”. In: *2014 International Joint Conference on Neural Networks (IJCNN)*,. Ieee, 2014, pp. 1984–1991
- **Ankur Sinha** and Jack Jianguo Wang. “Bio-mimetic Path Integration Using a Self Organizing Population of Grid Cells”. In: *Artificial Neural Networks and Machine Learning–ICANN 2014*. Springer, 2014, p. 675

#### PEER-REVIEW ACTIVITY

- 2021–: reviewer at [Frontiers](#) (2 reviews)

## SELECTED CONTRIBUTIONS TO SCIENTIFIC SOFTWARE

- **Ankur Sinha**, Pdraig Gleeson, Richard C. Gerkin, David Lung, Boris Marin, Rokas Stanislovas, Shayan Shafquat, Chaitanya Chintaluri, Mark Watts, 34383c, András Ecker, and Johannes Rieke. *NeuroML/pyNeuroML: v1.2.5*. Version v1.2.5. Mar. 2024. DOI: 10.5281/zenodo.10783062. URL: <https://doi.org/10.5281/zenodo.10783062>

## DATA SETS

- **Ankur Sinha**, Christoph Metzner, Neil Davey, Roderick Adams, Micheal Schmuker, and Volker Steuber. *Simulation generated data for: Growth Rules for the Repair of Asynchronous Irregular Neuronal Networks after Peripheral Lesions*. Zenodo, 2021. DOI: 10.5281/zenodo.4727700

## WORKSHOPS

- October 2021: NeuroML development workshop at COMBINE 2021.
- July 2019: Co-organiser of the CNS 2019 student and post-doc career development workshop.

## TUTORIALS

- August 2021: Co-organiser of NeuroML tutorial at INCF Training Weeks.
- July 2021: Co-organiser of CNS 2021 Software working group tutorials on Bash, Git, and Python.
- July 2021: Co-organiser of NeuroML tutorial at CNS 2021.

## OTHERS

- April 2021: Seminar on NeuroFedora at the World Wide Open Source seminar series.

## AWARDS AND ACHIEVEMENTS

- 2019: CNS 2019 conference travel funding award.
- 2019: UH Post graduate researcher conference funding award.
- 2018: CNS 2018 conference travel funding award.
- 2018: 3 Minute Thesis (3MT) competition finalist.
- 2016: UH Post graduate researcher conference funding award.
- 2014: UH PhD scholarship.
- 2014: UTS Vice Chancellor's conference fund grant.
- 2014: UTS FEIT travel grant.

## REFEREES

Available on request.