SHAILESH APPUKUTTAN

Postdoctoral Researcher

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CONTACT

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LANGUAGES

- **English:** *Fluent*
- **Hindi:** *Fluent*
- **Malayalam:** *Average*
- **French:** *A2-B1 Level*
- **Portuguese:** *Beginner*

PROFILE INFO

I am highly motivated to apply computational techniques to challenges in interdisciplinary domains. I strongly believe in their immense potential for the development of novel approaches to tackling existing issues.

My work in the Human Brain Project involved the design and development of a model validation framework for neuroscience, focusing on the systematic assessment and benchmarking of models. I have also been actively involved in several projects to enable reproducible science.

In February 2023, I received my **Microsoft certification** as **Azure Data Scientist Associate.**

RESEARCH INTERESTS

- Computational Modeling
- Data-Driven Validation
- Machine Learning
- Web Development

WORK EXPERIENCE

2022 – 2017
Postdoctoral Researcher - *ICN, NeuroPSI, CNRS*
Designed and developed a framework for data-driven validation of computational models; also other tools to enable reproducible science

2016 – 2015
Research Associate - *IIT Bombay*
Developed a computational model for 3D smooth muscle syncytia and employed it to investigate experimentally observed phenomena

2016
Visiting Faculty - *NMIMS SD-School Of Science*
Instructed an undergraduate course on Linux & R

2011 – 2009
Co-founder and Technical Head - *TechShiksha*
Coordinated an educational initiative that worked with NGOs to instill scientific thinking in children

2009 – 2008
Technical Associate - *TechMahindra*
Worked as developer on a project for British Telecom using the Oracle Siebel SRM platform

EDUCATION

2015
Integrated Masters + Ph.D. – Biomedical Engr.
Indian Institute of Technology, Mumbai, India
CPI 9.52/10.00; GATE 2009 CS Rank: 239, Percentile: 99.43

2008
Bachelor of Engineering – Computer Science
SIES Graduate School of Technology, India

SKILLS & EXPERTISE

- I have successfully worked with over **20+ programming and scripting languages**. I am proficient in **Python** and **ReactJS**.
- I am a **Microsoft** certified **Azure Data Scientist Associate**. I am currently pursuing another certification for a **Data Scientist** career track.
- On the **modeling** front, I am adept with the **NEURON** simulator, and have practical knowledge of others such as **Brian2**, **NEST** and **PyNN**.
- Having served as a **teaching assistant** for several years, I have a strong understanding of **cellular biophysics**, and the **mathematics** underlying their analytical modeling.
- **Version control** using **Git** is an integral part of my work; used both GitHub and GitLab.
- I have significant experience with **web development**; designed and developed several **web-based tools** for neuroscience; currently serve as the website manager of OCNS.
- I am **fluent** in both written and spoken **English**. I have written my doctoral thesis and several scientific publications in English, and also given talks at various events.

MEMBERSHIPS & ROLES

Serving on the **Board of Directors of OCNS**	(2021 - till date)
Serving as **Website and Infrastructure manager** of OCNS	(2021 - till date)
Administrator of **comp-neuro mailing list**	(2022 - till date)
Co-chair and founding member of **INCF/OCNS Software WG**	(2020 - 2023)
Review editor for **Frontiers in Neuroinformatics** journal	(2022 - till date)
Review editor for **Frontiers in Systems Biology** journal	(2022 - till date)
Reviewer for **ReScience C** journal	(2018 - till date)
Member of **SANKET consortium** for brain research	(2019 - till date)
Member of Program Committee for **HBP CodeJam #11 & #12**	(2020 - 2021)
Served as a committee member for **PDP conferences**	(2018 - 2020)
Member of **HBP Data Governance Working Group**	(2018 - 2019)

OTHER ACTIVITIES

- Developed several software video tutorials for the official EBRAINS channel (2022)
- Conducted a tutorial showcasing HBP/EBRAINS tools and services at CNS 2022
- Conducted a tutorial on 'Python for beginners' at CNS 2021
- Organized EBRAINS Infrastructure Training on Model Validation (2021)
- Teaching assistant for several courses at IIT Bombay, India:
  - ✔ BB803 – Advanced Cellular Electrophysiology (2013 - 2015)
  - ✔ BM636 – Bioelectricity (2011 - 2013)
  - ✔ BM651 – Biopotentials (2011 - 2013)
  - ✔ BM627 – Virtual Instrumentation (2010 - 2013)

PUBLICATION INFO

- Published 12 scientific articles in indexed journals; also published 5 articles as part of conference proceedings; 2 more articles currently available as pre-prints
- Presented 15+ posters at various conferences and workshops
- Editor-cum-author for a monograph on computational investigation of smooth muscle

A list of my recent publications:

- ✔ Davison, A. P., & **Appukuttan, S.** (2022). *A faster way to model neuronal circuitry (using artificial neural networks)*. ***eLife***, *11*, e84463. doi: 10.7554/eLife.84463
- ✔ **Appukuttan, S.**, & Davison, A. P. (2022). *Reproducing and quantitatively validating a biologically-constrained point-neuron model of CA1 pyramidal cells*. ***Frontiers in Integrative Neuroscience***, 16. doi: 10.3389/fnint.2022.1041423
- ✔ Basu, K. *, **Appukuttan, S. ***, Manchanda, R., & Sik, A. (2022). *Difference in axon diameter and myelin thickness between excitatory and inhibitory callosally projecting axons in mice*. ***Cerebral Cortex***. doi: 10.1093/cercor/bhac329 *(* : joint first authors).*
- ✔ Bologna, L. L., Smiriglia, R., Lupascu, C. A., **Appukuttan, S.**, Davison, A., Ivaska, G., ... Migliore, M. (2022). *The EBRAINS Hodgkin-Huxley Neuron Builder: An Online Resource For Building Data-Driven Neuron Models*. ***Frontiers in Neuroinformatics***, 16. doi: 10.3389/fninf.2022.991609
- ✔ **Appukuttan, S.**, Bologna, L. L., Schürmann, F., Migliore, M., & Davison, A. P. (2022). *EBRAINS Live Papers - Interactive resource sheets for computational studies in neuroscience*. ***Neuroinformatics***, 1-13. doi: 10.1007/s12021-022-09598-z
- ✔ **Appukuttan, S.**, Brain, K. L., & Manchanda, R. (2021). *Effect of Variations in Gap Junctional Coupling on the Frequency of Oscillatory Action Potentials in a Smooth Muscle Syncytium*. *Frontiers in Physiology*, 12. doi: 10.3389/fphys.2021.655225
- ✔ Sáray, S., Rössert, C. A., **Appukuttan, S.**, Migliore, R., Vitale, P., Lupascu, C. A., ... & Káli, S. (2021). *HippoUnit: A software tool for the automated testing and systematic comparison of detailed models of hippocampal neurons based on electrophysiological data*. ***PLoS Computational Biology***, 17(1), e1008114. doi: 10.1371/journal.pcbi.1008114
- ✔ Manchanda, R., **Appukuttan, S.**, & Padmakumar, M. (2019). *Electrophysiology of Syncytial Smooth Muscle*. ***Journal of Experimental Neuroscience***, 13, 1179069518821917. doi: 10.1177/1179069518821917
- ✔ **Appukuttan, S.**, Padmakumar, M., Young, J. S., Brain, K. L., & Manchanda, R. (2018). *Investigation of the syncytial nature of detrusor smooth muscle as a determinant of action potential shape*. ***Frontiers in Physiology***, 9, 1300. doi: 10.3389/fphys.2018.01300
- ✔ **Appukuttan, S.**, Brain, K. L., & Manchanda, R. (2017). *Modeling extracellular fields for a three-dimensional network of cells using neuron*. ***Journal of Neuroscience Methods***, 290, 27-38. doi: 10.1016/j.jneumeth.2017.07.005
- ✔ **Appukuttan, S.**, Padmakumar, M., Brain, K. L., & Manchanda, R. (2017). *A Method for the Analysis of AP Foot Convexity: Insights into Smooth Muscle Biophysics*. ***Frontiers in Bioengineering and Biotechnology***, 5. doi: 10.3389/fbioe.2017.00064
- ✔ **Appukuttan, S.**, Brain, K. L., & Manchanda, R. (2015). *A computational model of urinary bladder smooth muscle syncytium*. ***Journal of Computational Neuroscience***, 38(1), 167-187. doi: 10.1007/s10827-014-0532-6