UNDER REVIEW

RESCIENCE C

Replication / Computational Neuroscience

[Re] A circuit model of auditory cortex

Parvathy Neelakandan[1] **and Christoph Metzner**[1,2, ID]

[1]Neural Information Processing Group, Institute of Software Engineering and Theoretical Computer Science, Technische Universität Berlin, Berlin, Germany – [2]Biocomputation Group, Centre for Computer Science and Informatics Research, University of Hertfordshire, Hatfield, United Kingdom

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Introduction

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Methods

In this replication, we focus on the rate models proposed in the original article. The firing rate model was an extensions of the traditional Wilson-Cowan model[1] and represented an iso-frequency unit of the auditory cortex. This iso-frequency unit consisted of one excitatory and two inhibitory populations. Building on this unit a more complex three-unit rate models was developed, to investigate stimulus-specific adaptation, forward suppression, tunig-curve adaptation and feedforward functional connectivity.

Iso-Frequency Unit Model

Three-Unit Model

Reproduction of experiments

Reimplementation

The iso-frequency unit model and the three-unit model were both implemented in Python and integrated into the neurolib framework[2].

Discussion

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References

1. H. R. Wilson and J. D. Cowan. "Excitatory and Inhibitory Interactions in Localized Populations of Model Neurons." In: **Biophysical Journal** 12.1 (1972), pp. 1–24.
2. C. Cakan, C. Metzner, and N. Jajcay. **neurolib: A Python simulation framework for easy whole-brain neural mass modeling**. 2019.

Correspondence should be addressed to Christoph Metzner (cmetzner@ni.tu-berlin.de)
The authors have declared that no competing interests exists.
Code is available at https://github.com/ChristophMetzner/Park-Geffen-Replication.

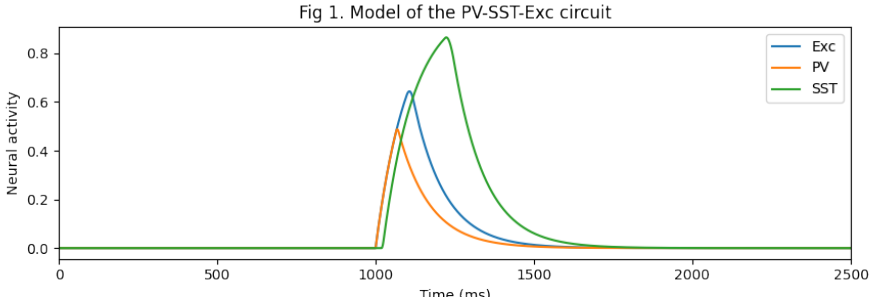


Figure 1. ReFig1

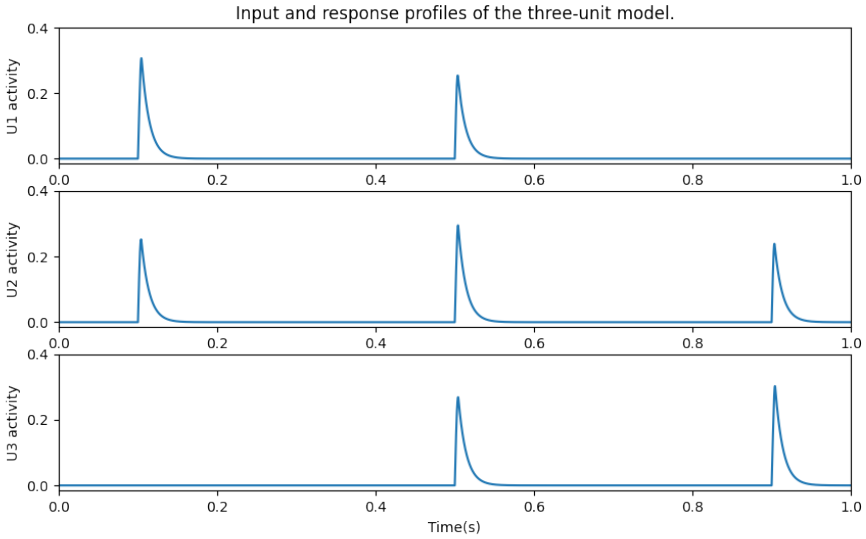
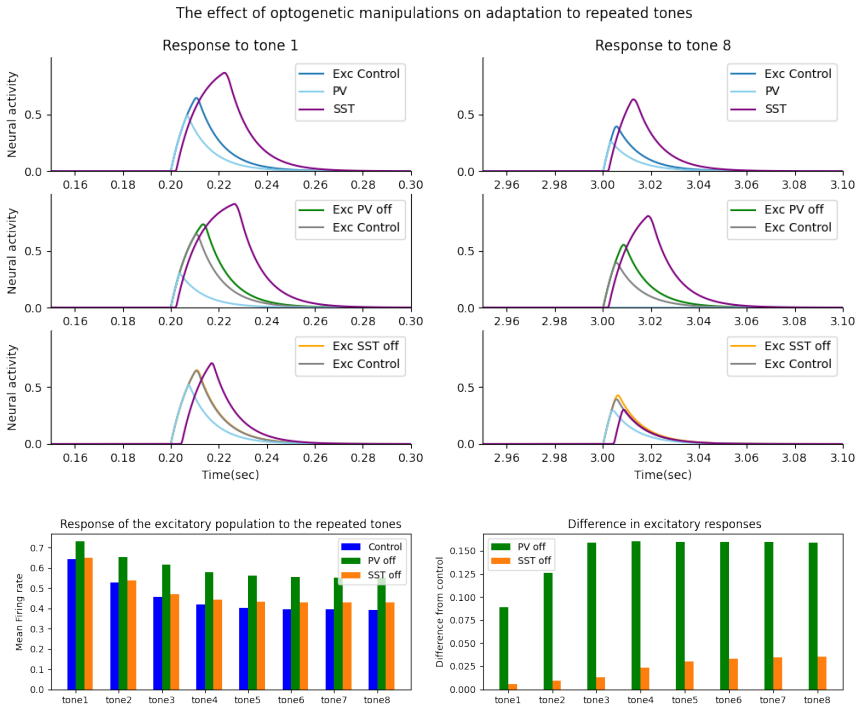


Figure 2. ReFig2



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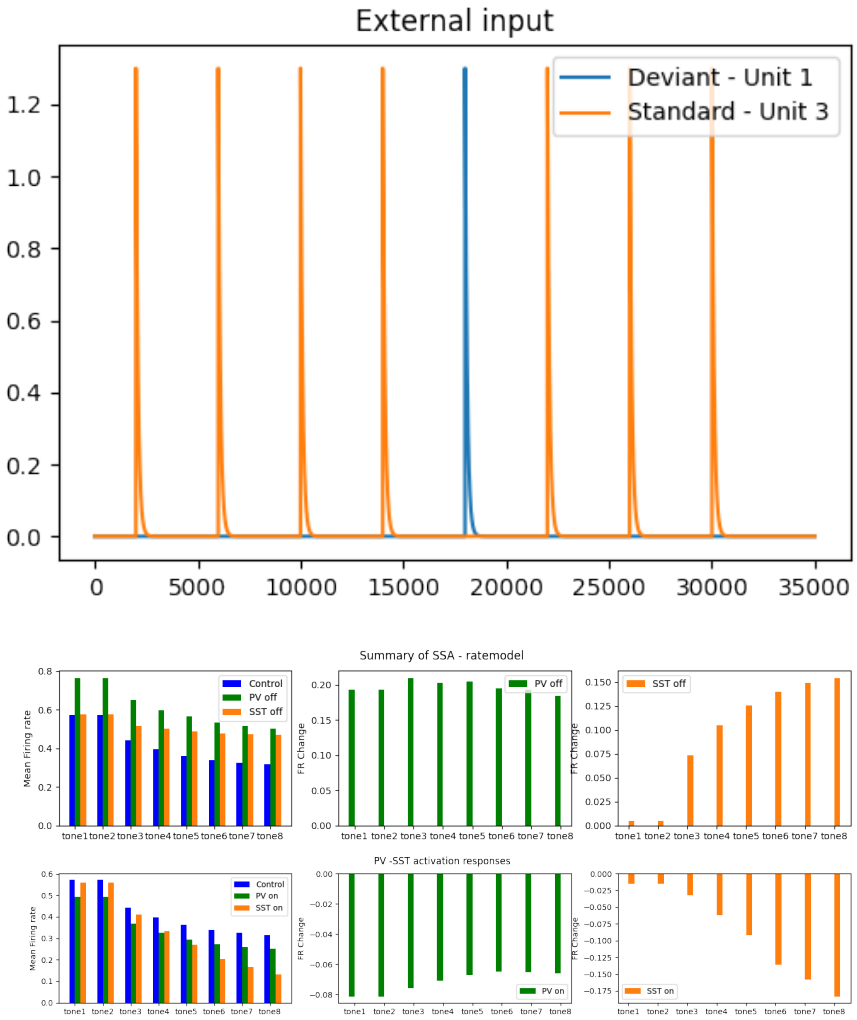

Figure 4. ReFig4

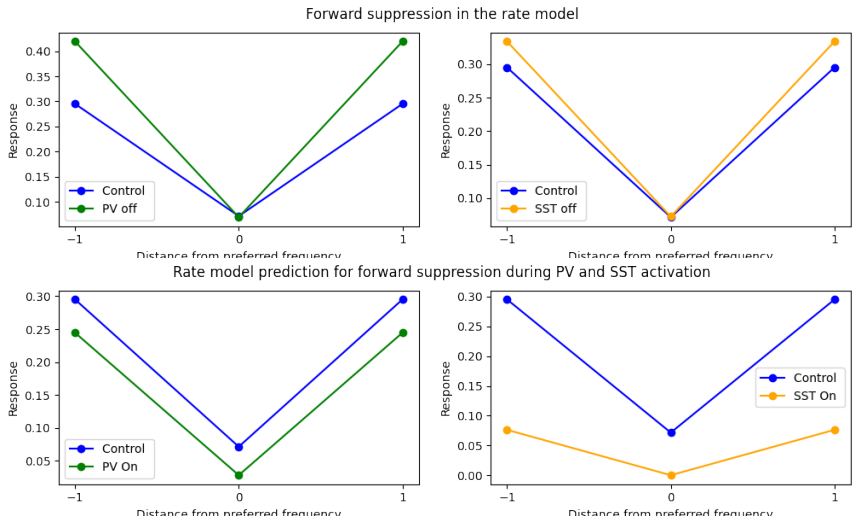

Figure 5. ReFig6

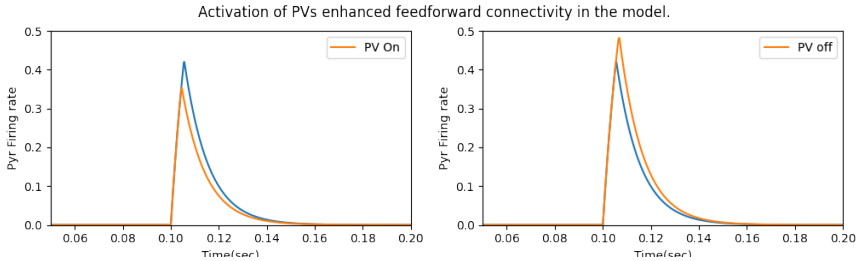

Figure 6. ReFig8

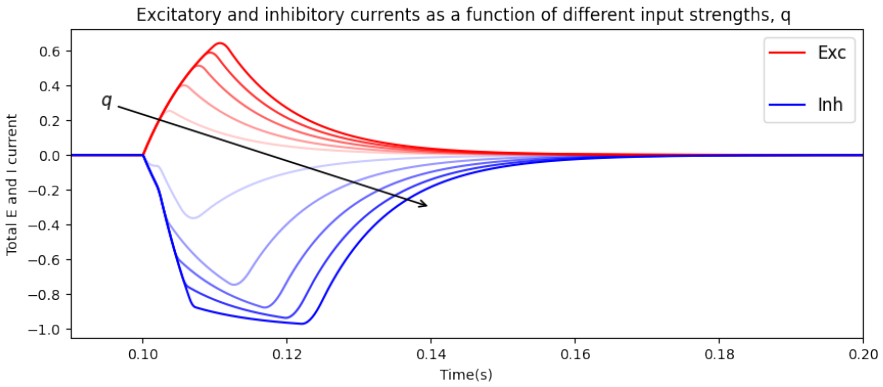

Figure 7. ReFig9