On the Use of Formal Methods to Model and Verify Neuronal Archetypes

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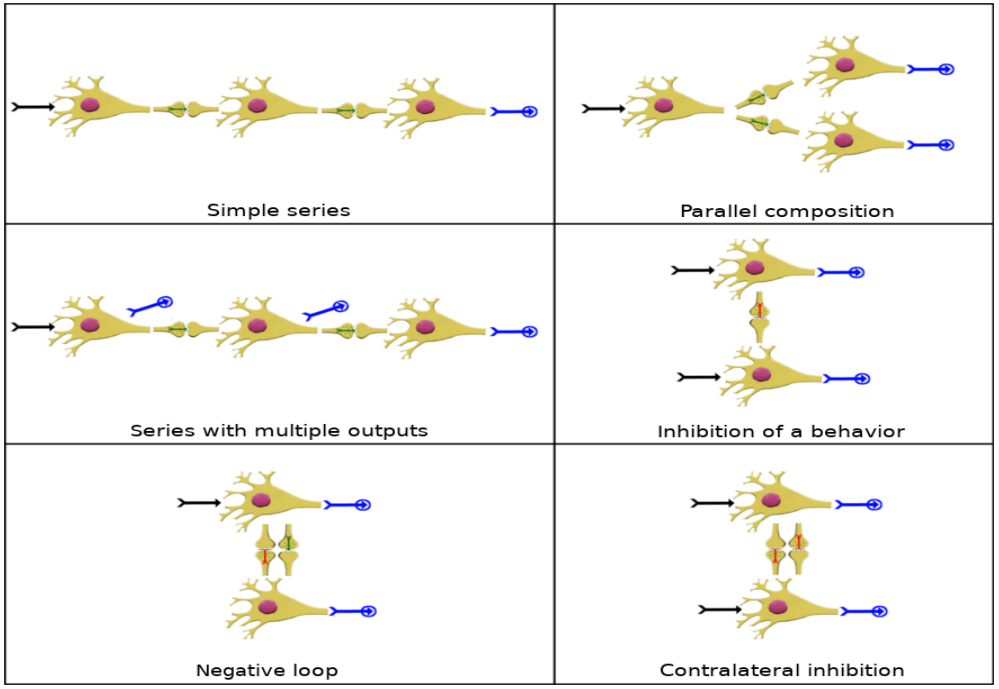
Problems and Ideas

- Some specific neuronal graphs (**archetypes**) are the basis of typical instances of neuronal information processing.

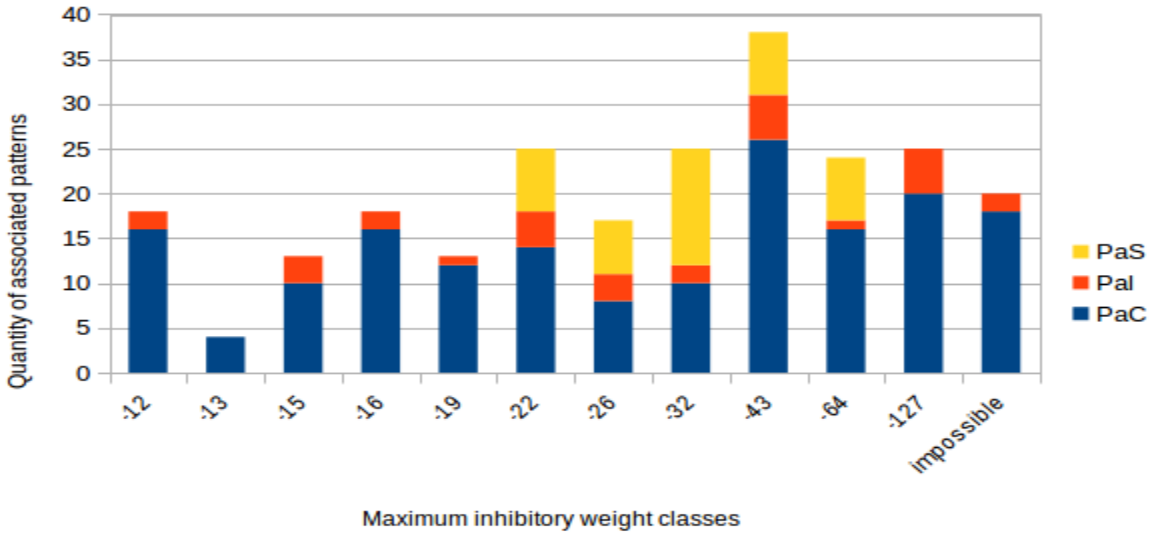


- **The basic archetypes.**

- **Idea**: Having a formal model of neural archetypes can greatly help in verifying their behavior and response to external factors.

Main Contributions

- We adopt a formal model to represent neurons, some crucial archetypes, and their composition.
- We use **model checking** and **theorem proving** to prove dynamic properties of archetypes and find classes of parameters that allow property verification.



- **Classes of maximal inhibitory weights allowing the inhibition behavior.**