

Matching cerebellar structures with algorithmic roles

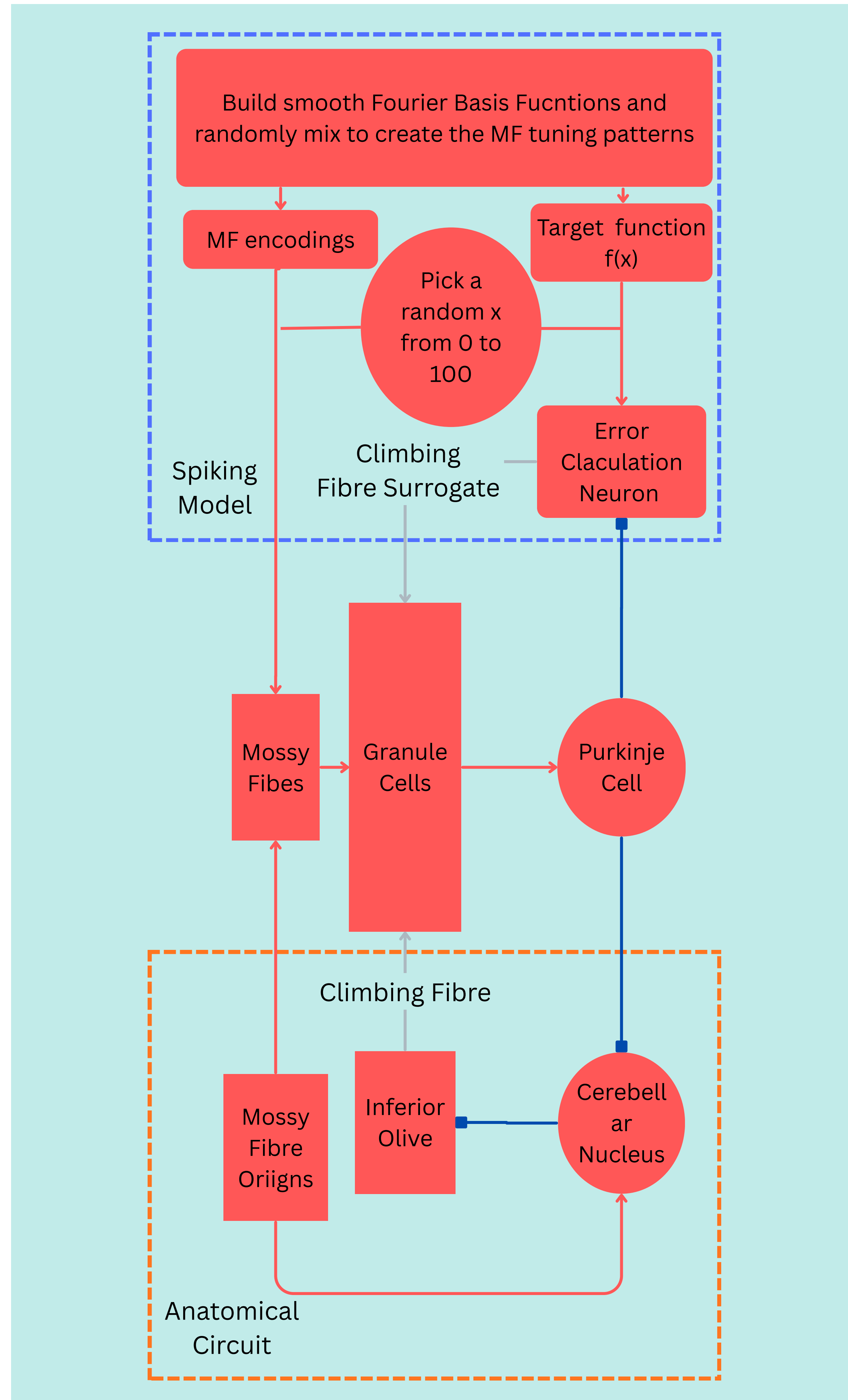
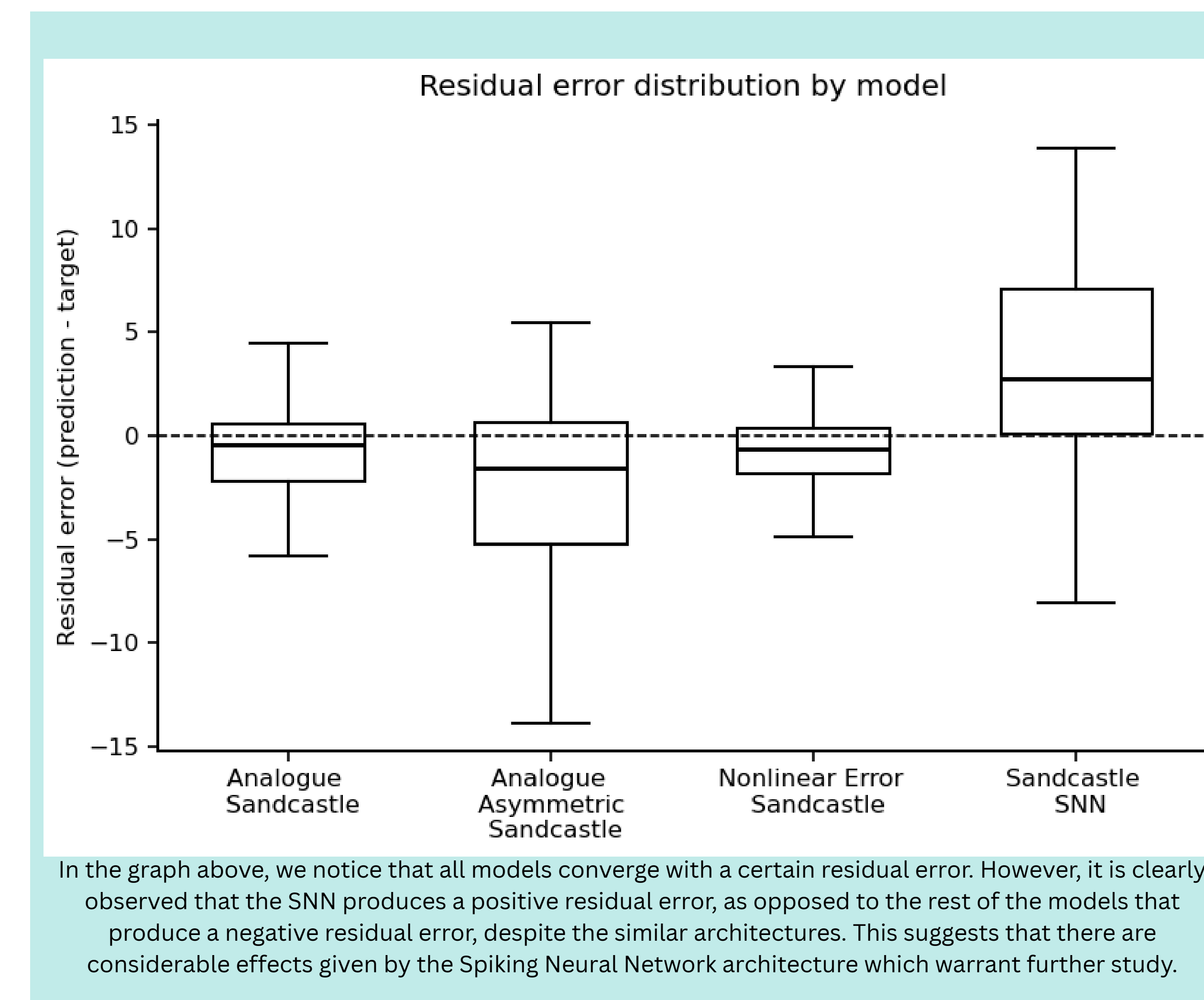
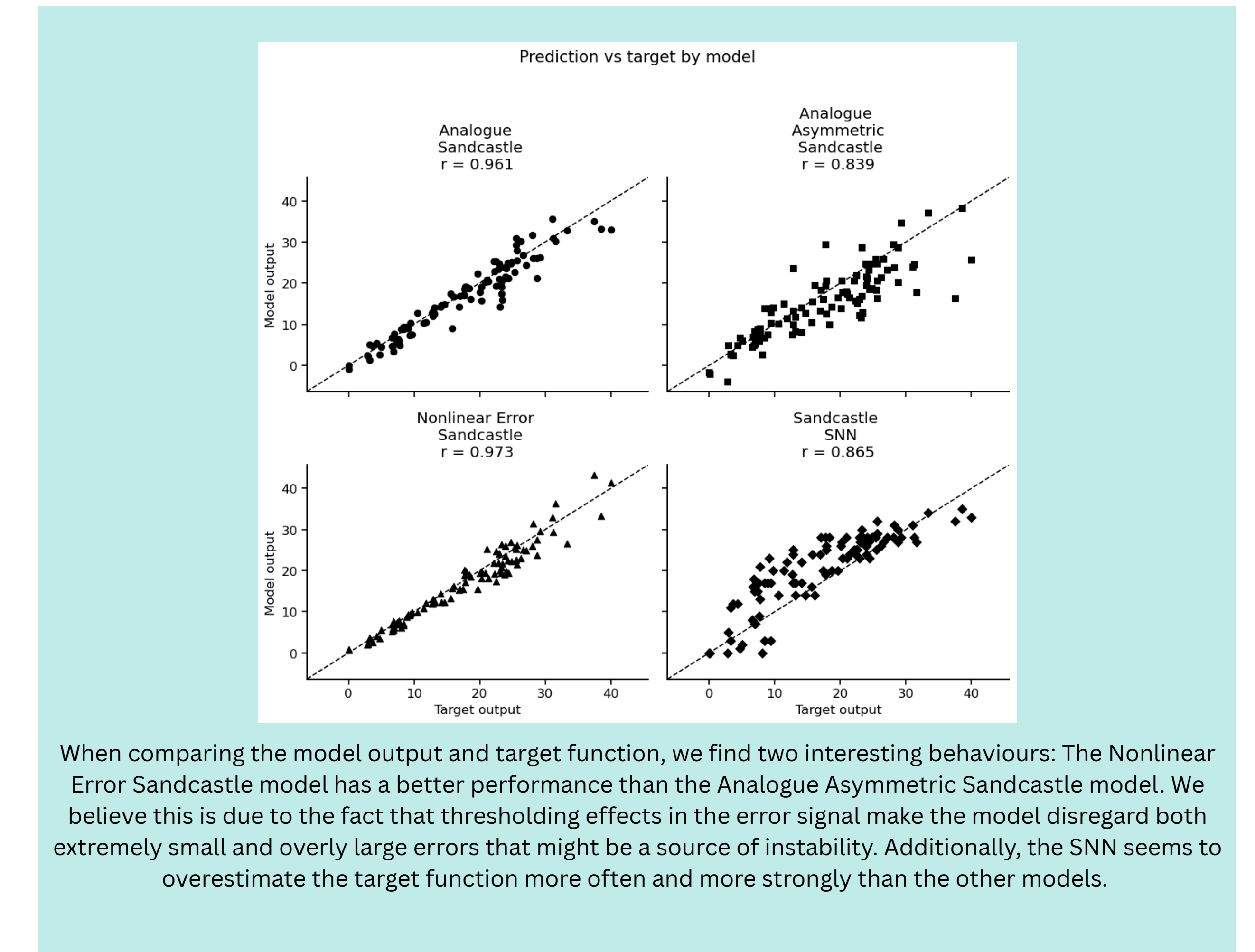


Table of Experiments

Analogue Sandcastle	Analogue Asymmetric Sandcastle	Nonlinear Error Sandcastle	Sandcastle SNN
Signed Universal Error	Positive Universal	Nonlinear Error	Spiking
Combined LTP/LTD Term	Separate LTP/LTD Terms	Separate LTP/LTD Terms	Separate LTP/LTD Terms
Analogue	Analogue	Analogue	Spiking



We built on the existent cerebellar function theory set up by Sanger et al. by introducing an asymmetric learning rule and spiking neural network simulations.

Unlike in the original model, the new learning rule additions cause the models to converge with a certain residual error.

While initially overlooked, the error encoding plays a crucial part in the performance of the models. One can observe the case where nonlinear error can cause stronger performance.

The Spiking Neural Network behaves completely differently from the analogue neural networks, suggesting a need for further study.