Finite Gaussian Neurons

A Defense Against Adversarial Attacks?

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Abstract

I introduce the Finite Gaussian Neuron, a novel neural network architecture.
My works aims to:

- make it easy to convert existing models to the FGN architecture
- while preserving the existing model's behavior on real data
- and offering resistance against some adversarial attacks.

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Introduction

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Related Work

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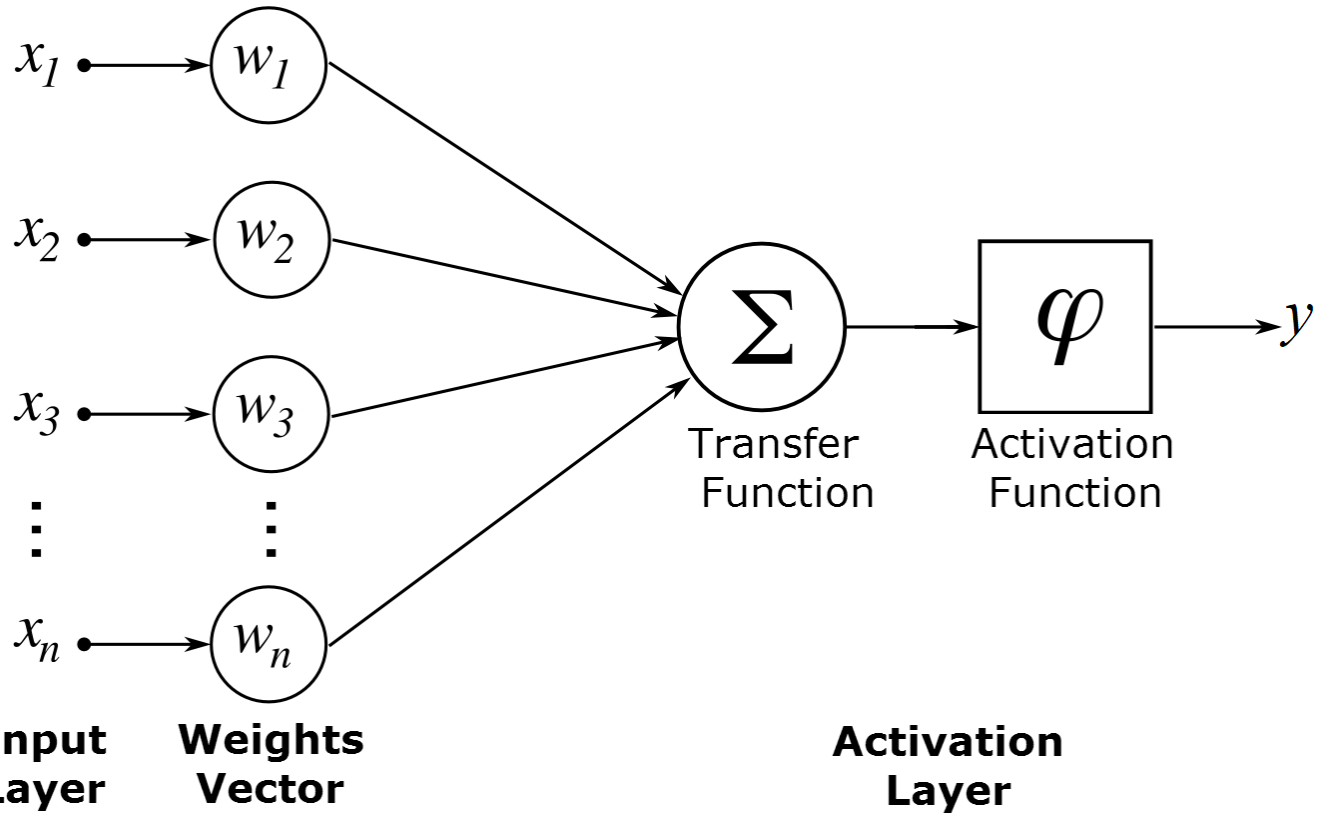
The Classic Neuron

Neuron output:

$$y = \varphi(l)$$

Linear component:

$$l = \sum_i x_i w_i$$



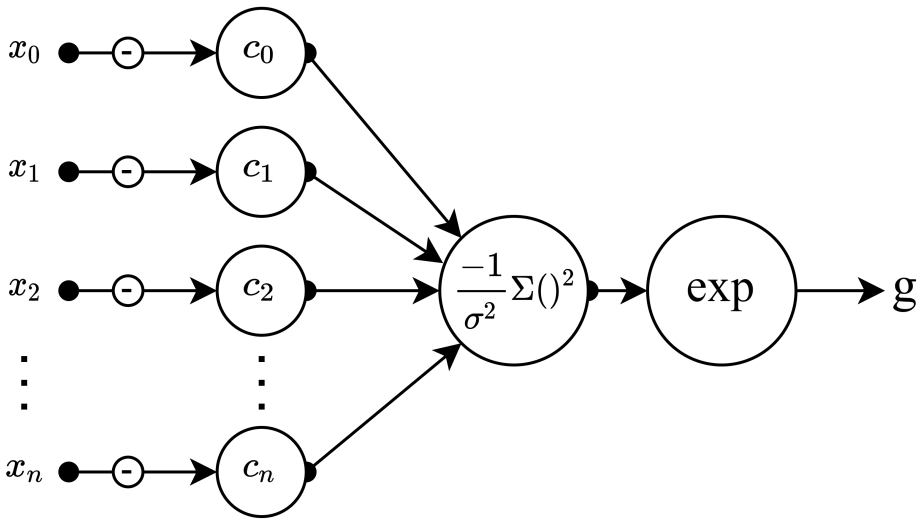
The Finite Gaussian Neuron

Neuron output:

$$y = \varphi(\sum_i x_i w_i) * g$$

Gaussian component:

$$g = exp\left(\frac{-1}{\sigma^2} * \sum_i (x_i - c_i)^2\right)$$



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2D Illustration

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