

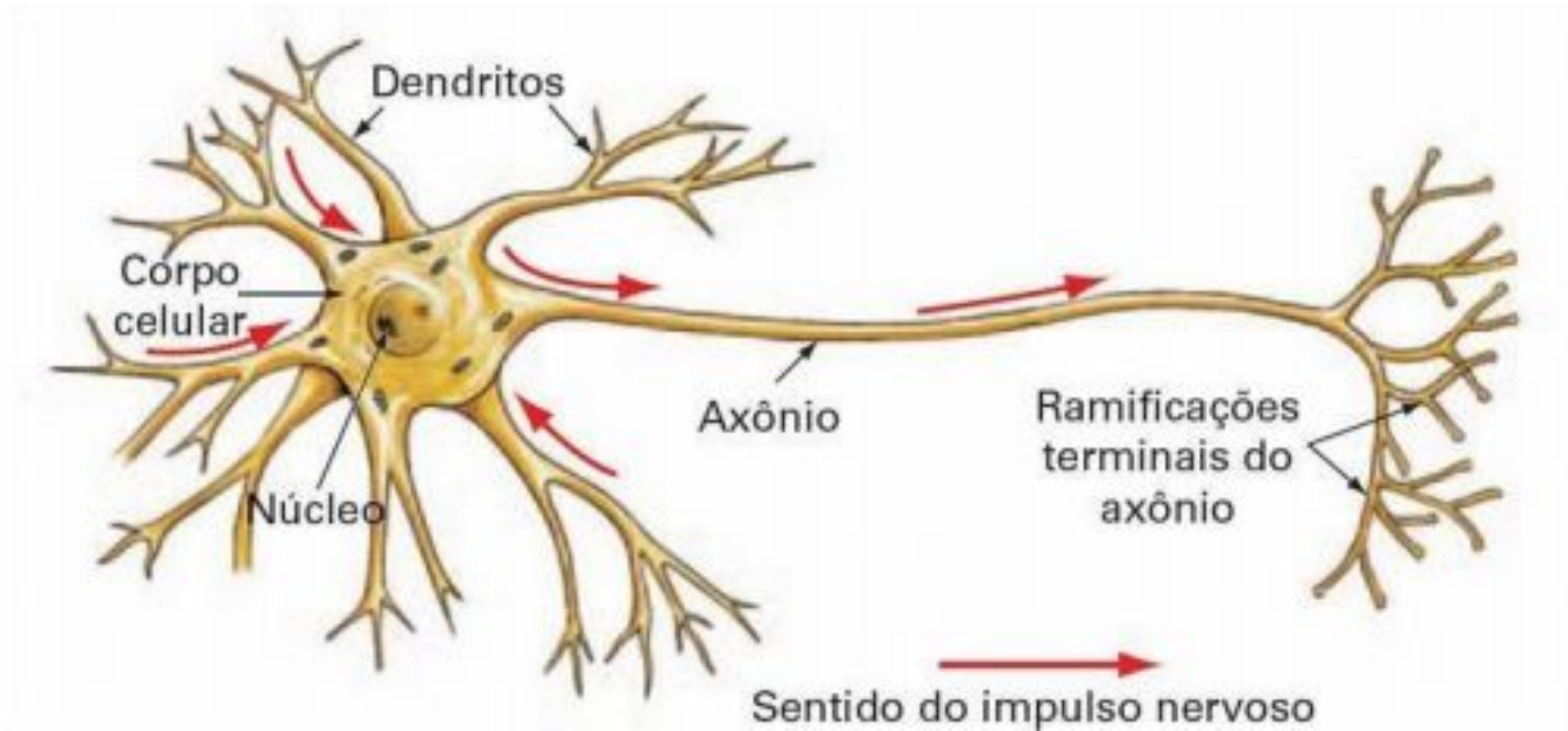
Machine Learning com Python

Prof. Luciano Galdino

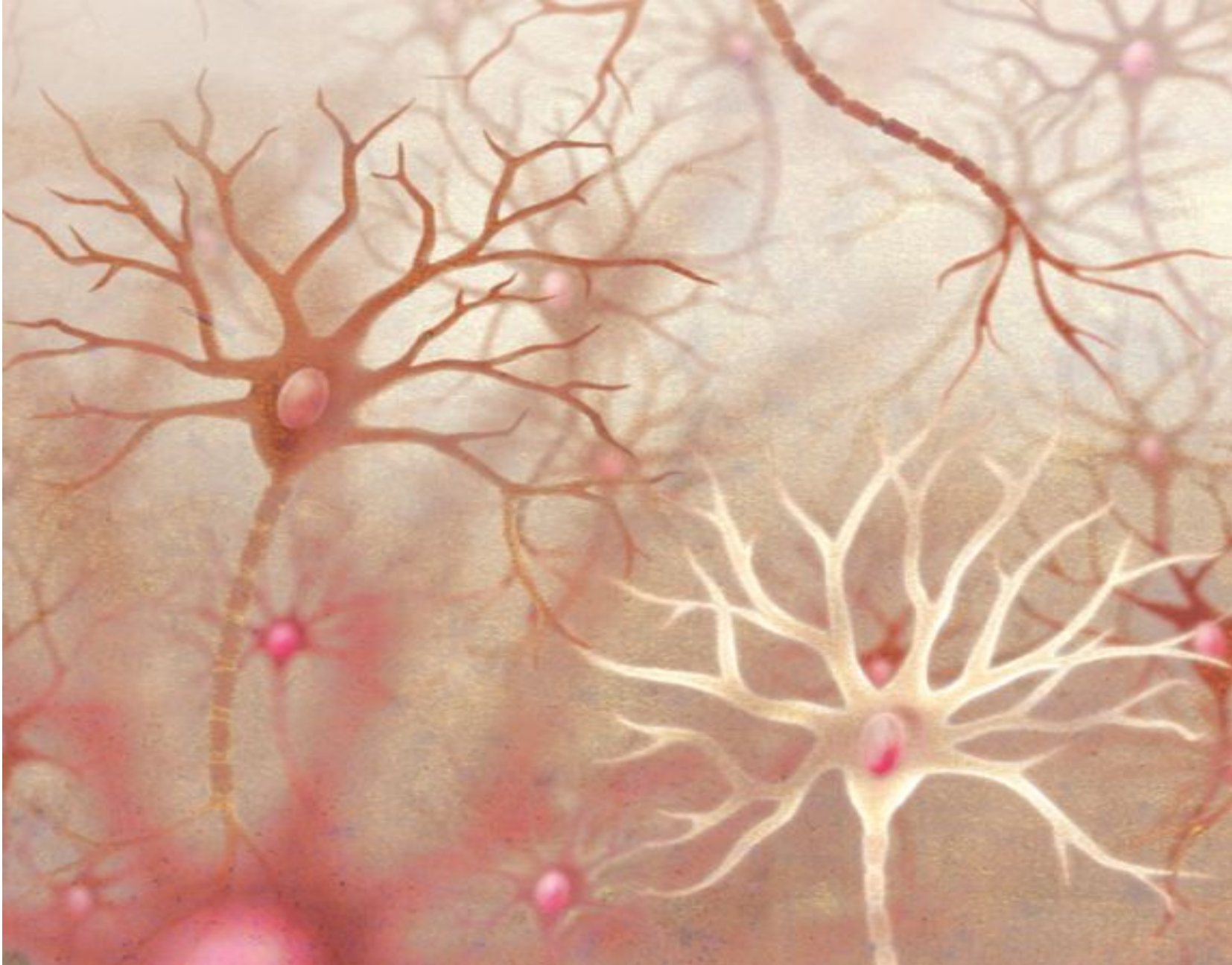
Neurônio Biológico e Artificial

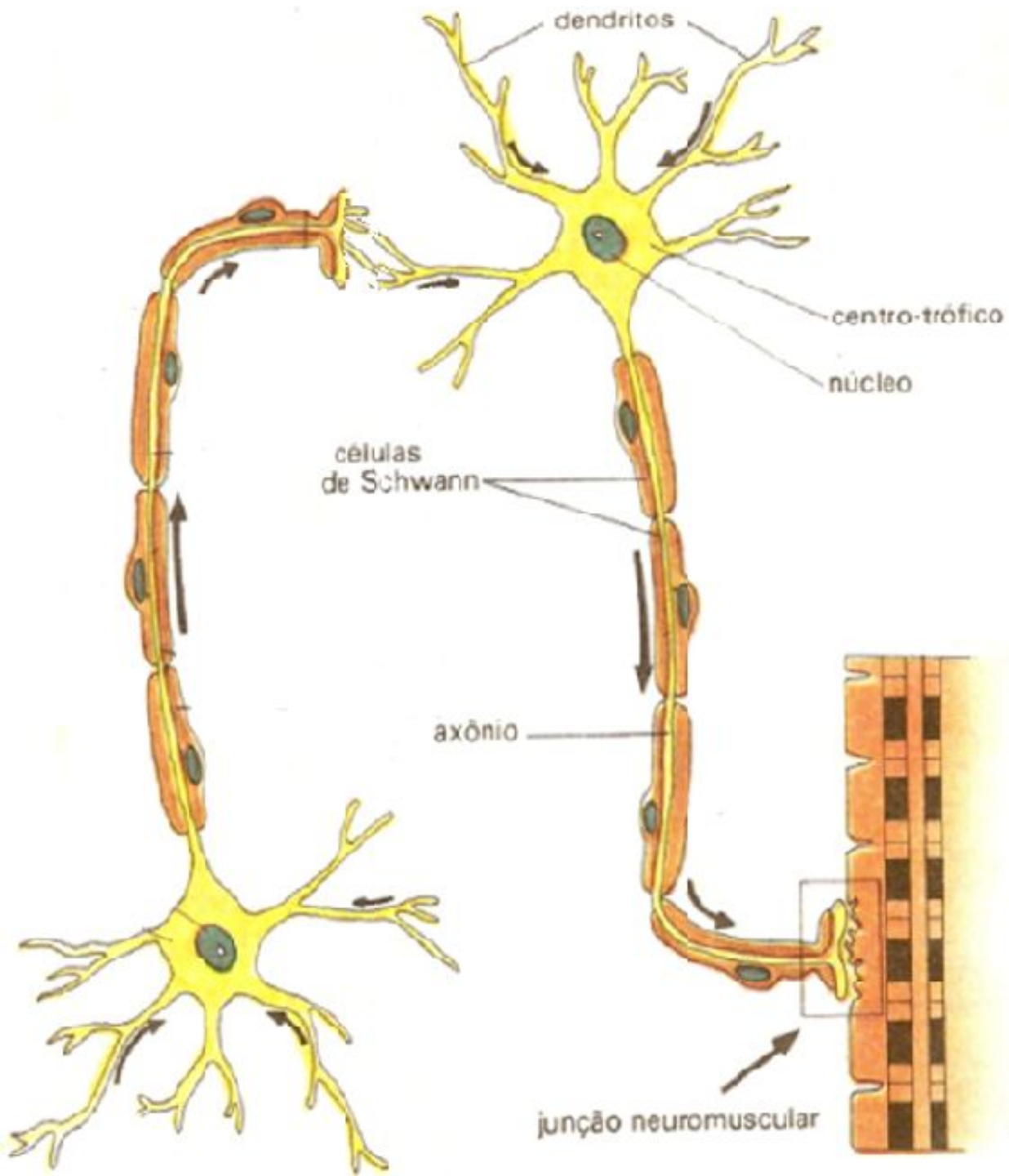
Neurônio Biológico (Célula Nervosa)

Representação esquemática.



Rede Neural Biológica

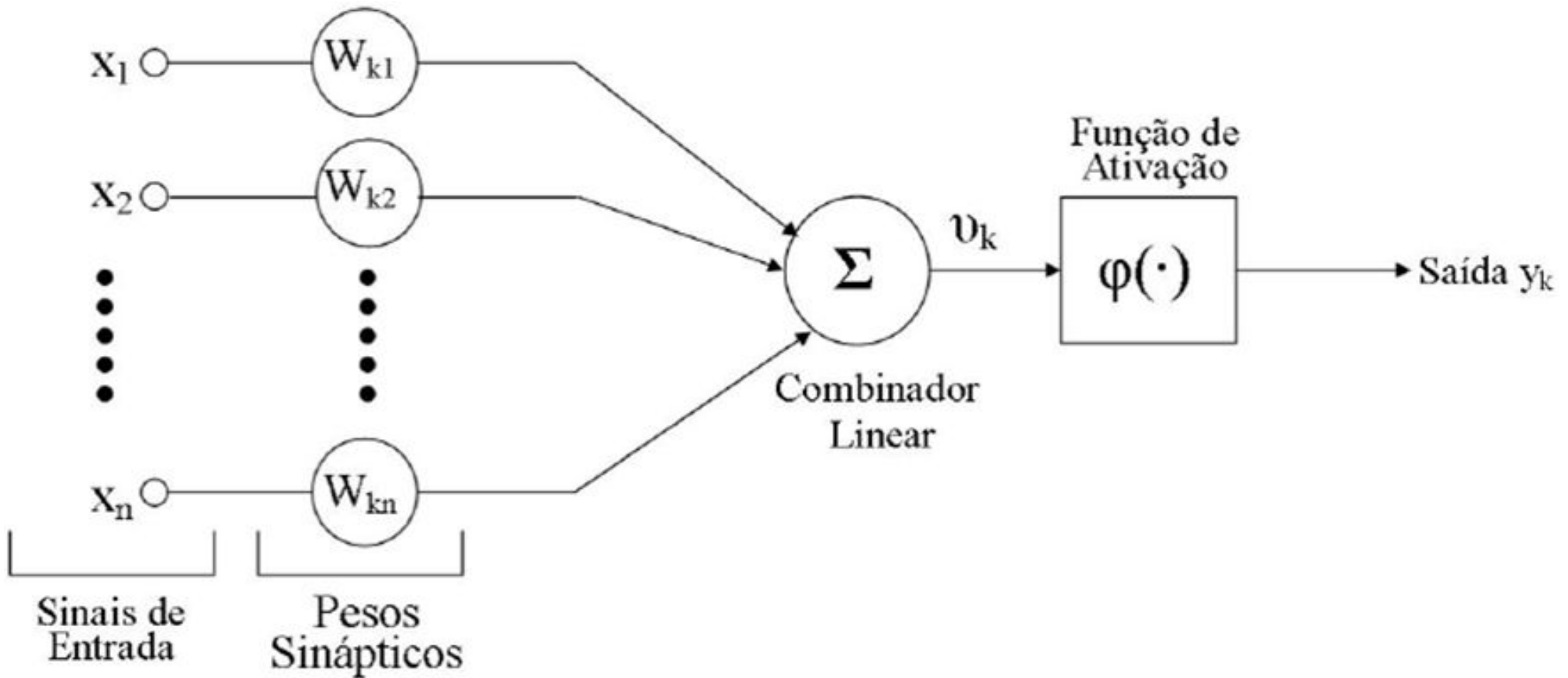




Fluxo nervoso: dendritos, centro-trófico, axônio e dendrito do neurônio seguinte e assim por diante até chegar numa célula muscular ou glandular.

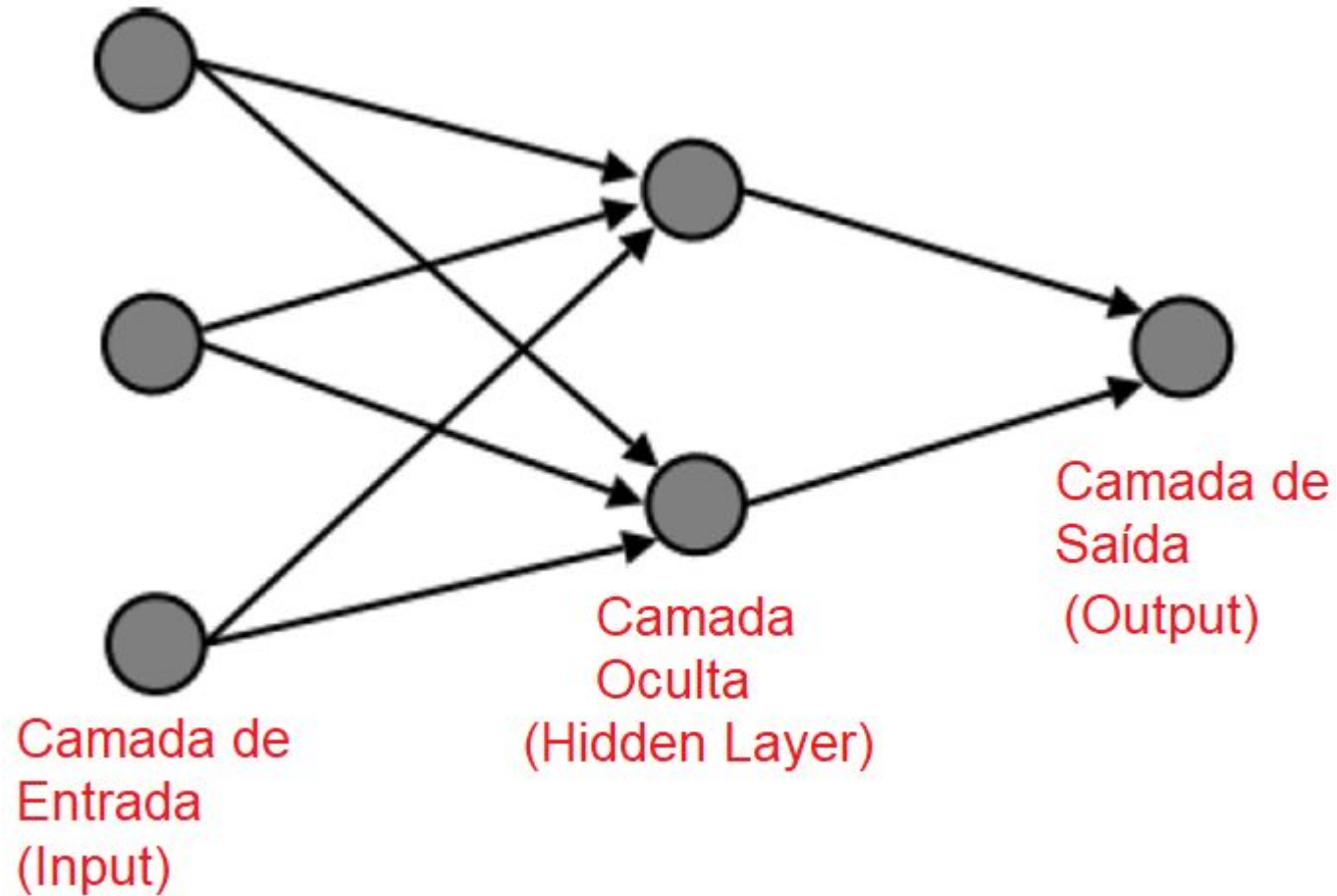
Sinapse nervosa: ocorre nos contatos entre os neurônios, através dos mediadores químicos da sinapse (neurotransmissores).

Neurônio Artificial (Matemático)

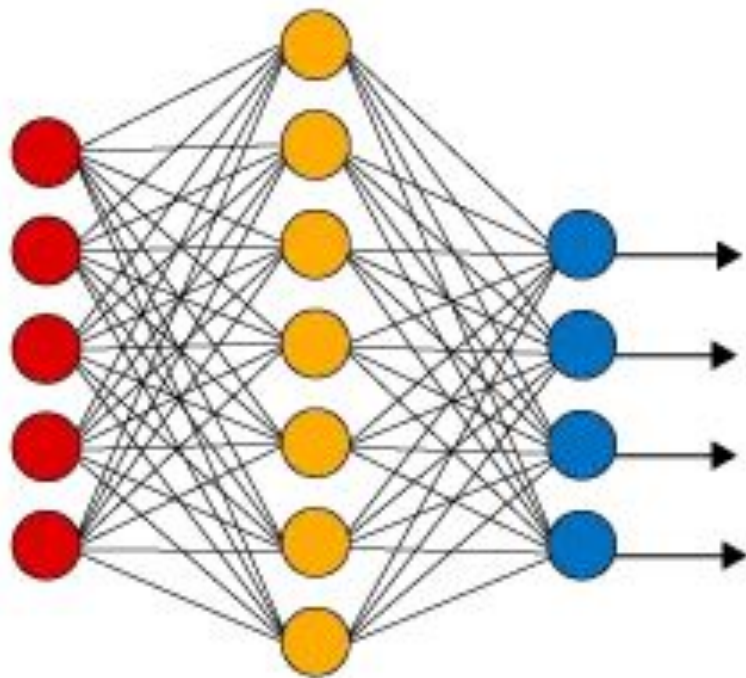


Rede Neural Artificial

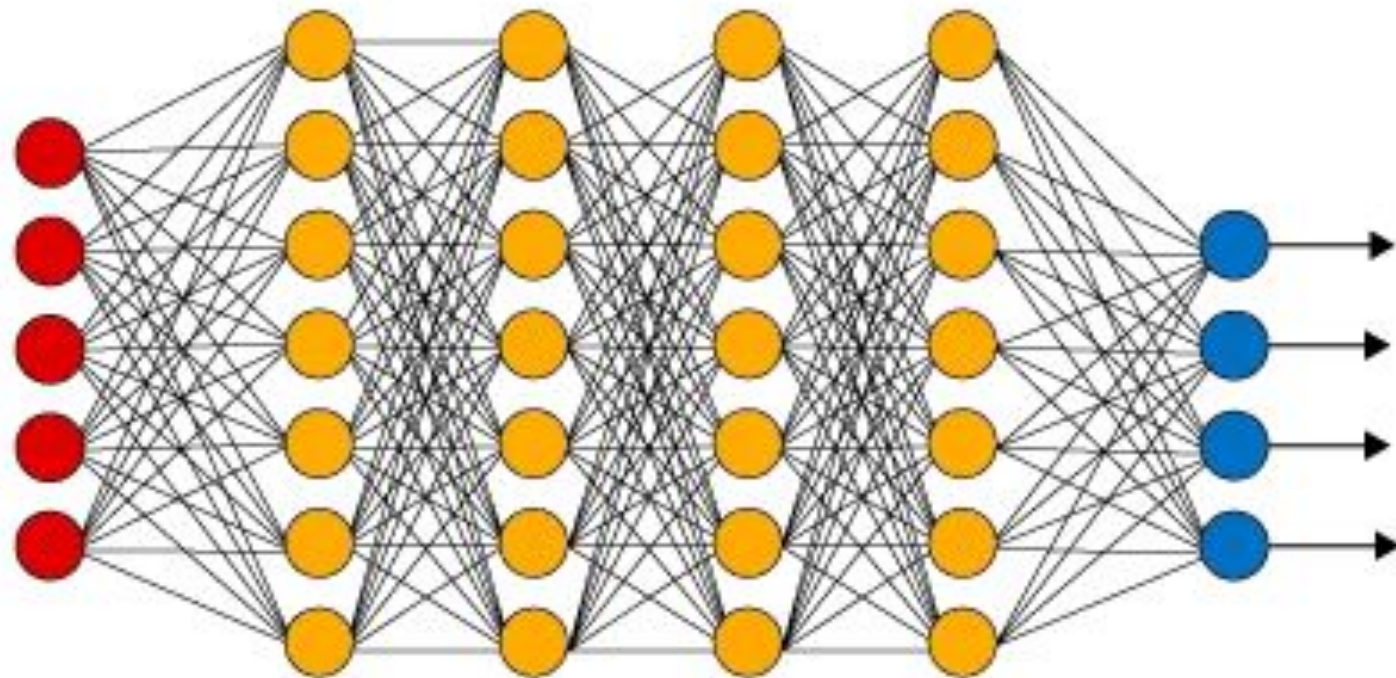
Conjunto de neurônios interligados.



Rede Neural Simples



Rede Neural Profunda (Deep Learning)



Redes Neurais

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- Célula de entrada
- Célula de entrada retroalimentada
- △ Célula de entrada com ruído
- Célula escondida
- Célula escondida probabilística
- △ Célula escondida com disparo
- Célula cápsula
- Célula de saída
- Célula de saída igual à de entrada
- Célula recorrente
- Célula de memória
- △ Célula de memória com portão
- Kernel
- Convolução ou pool

Perceptron (P)



Feed Forward (FF)



Radial Basis Network (RBF)



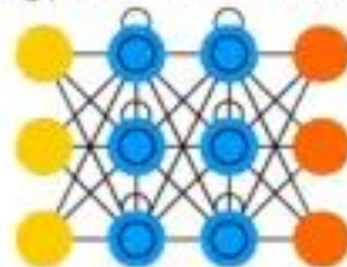
Deep Feed Forward (DFF)



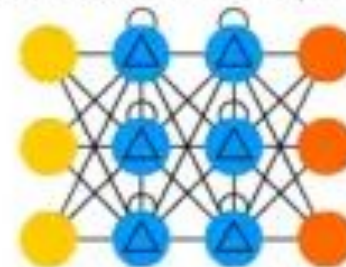
Recurrent Neural Network (RNN)



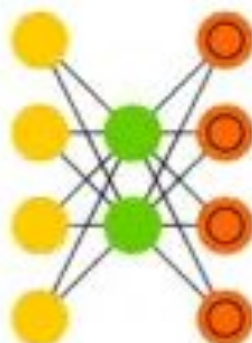
Long / Short Term Memory (LSTM)



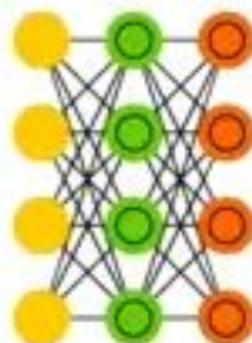
Gated Recurrent Unit (GRU)



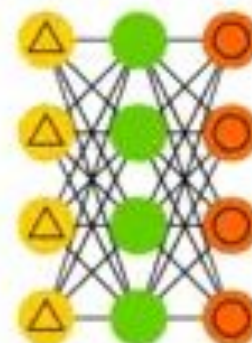
Auto Encoder (AE)



Variational AE (VAE)



Denoising AE (DAE)



Sparse AE (SAE)



Markov Chain (MC)



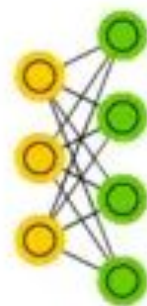
Hopfield Network (HN)



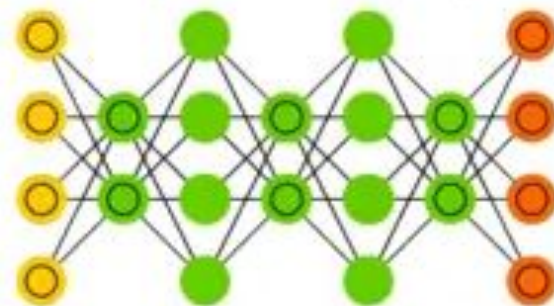
Boltzmann Machine (BM)



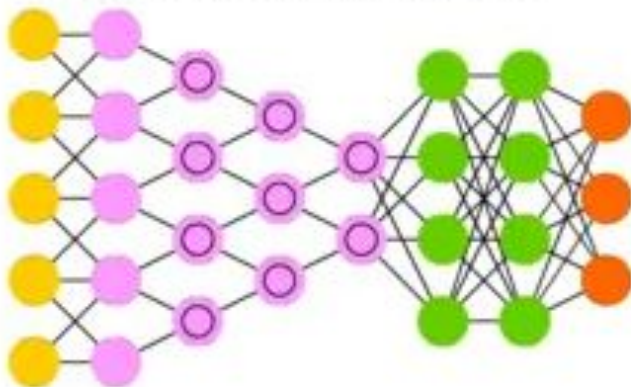
Restricted BM (RBM)



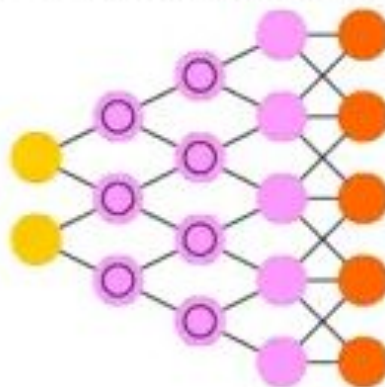
Deep Belief Network (DBN)



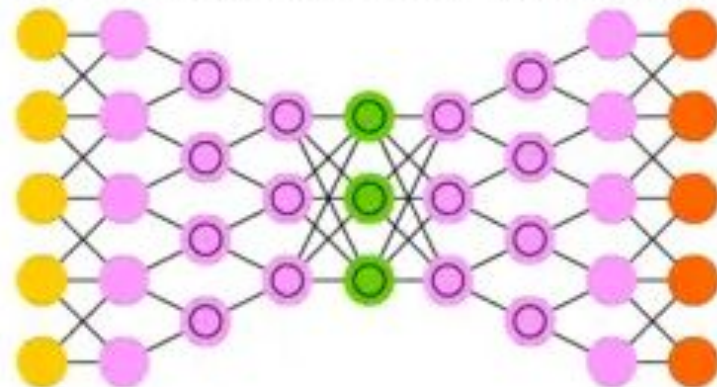
Deep Convolutional Network (DCN)



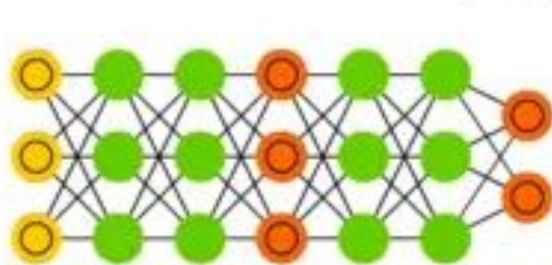
Deconvolutional Network (DN)



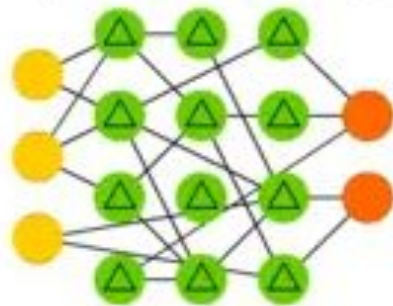
Deep Convolutional Inverse Graphics Network (DCIGN)



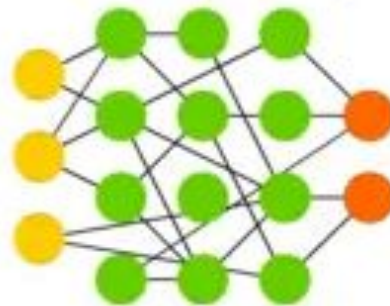
Generative Adversarial Network (GAN)



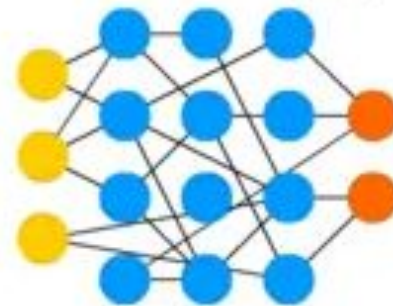
Liquid State Machine (LSM)



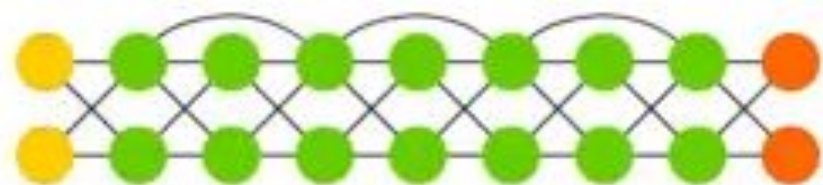
Extreme Learning Machine (ELM)



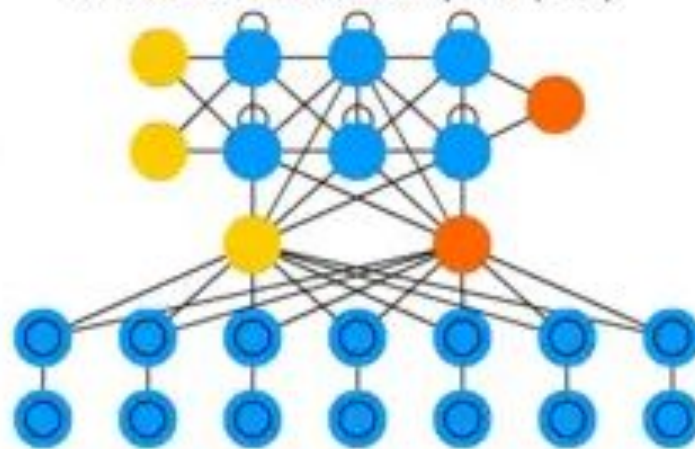
Echo State Network (ESN)



Deep Residual Network (DRN)



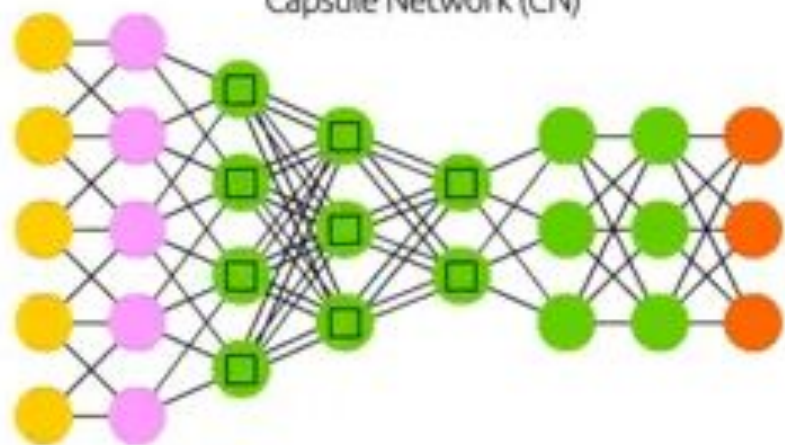
Differentiable Neural Computer (DNC)



Neural Turing Machine (NTM)



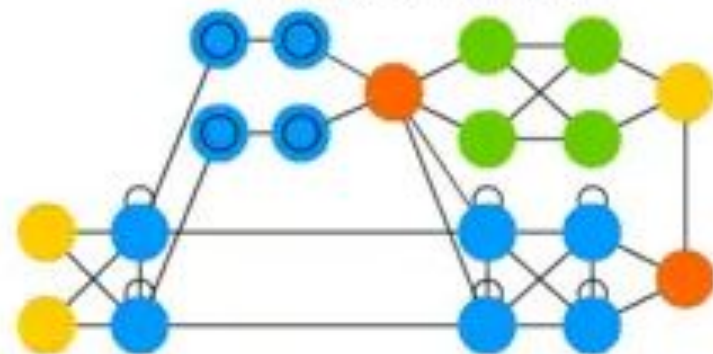
Capsule Network (CN)



Kohonen Network (KN)



Attention Network (AN)



Principais redes

- Redes Multilayer Perceptron (classificação binária).
- Redes Neurais Convolucionais (classificar imagens).
- Redes Neurais Recorrentes (processamento de dados sequenciais, como som, dados de séries temporais ou linguagem natural).
- Long Short-Term Memory (LSTM): variação da rede recorrente.
- Redes de Hopfield (armazenar memórias).
- Máquinas de Boltzmann (rede neural recorrente estocástica).
- Deep Belief Network (reconhecer, agrupar, gerar imagens, vídeos, dados de captura de movimento e processamento de linguagem natural).
- Deep Auto-Encoders (reduzir a dimensionalidade).
- Generative Adversarial Network (imita qualquer distribuição de dados)
- Deep Neural Network Capsules (maior expansão de Deep Learning).