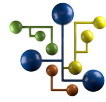


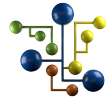
# Formação Inteligência Artificial



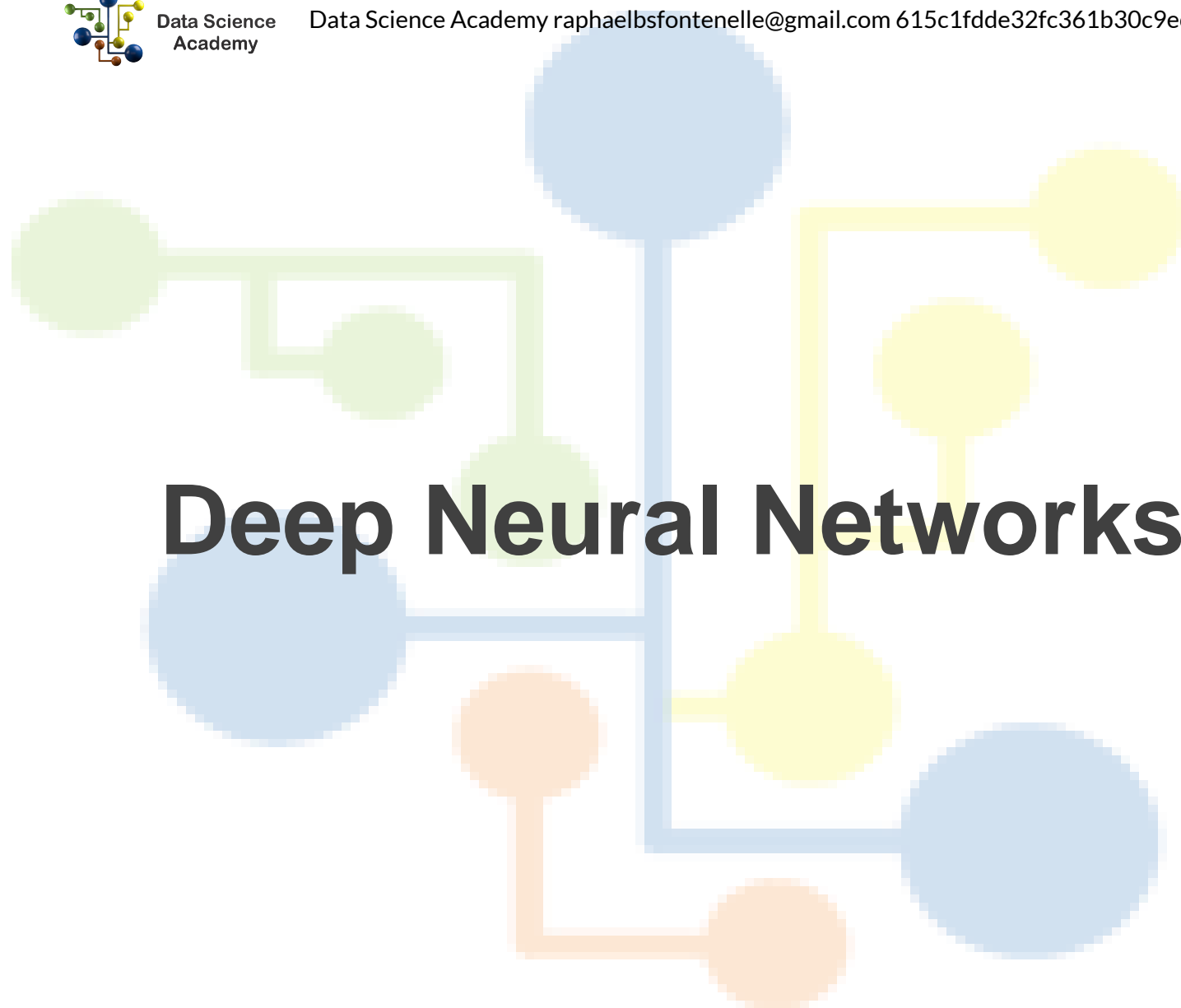
# Deep Learning I



# Deep Neural Networks



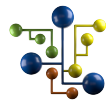
# Deep Neural Networks



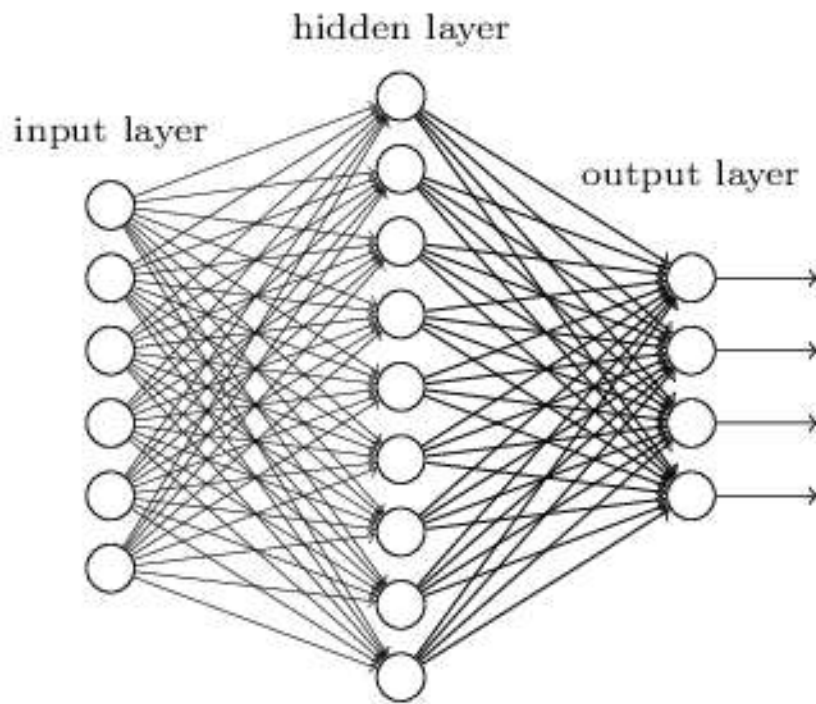
# Redes Neurais x Redes Neurais Profundas



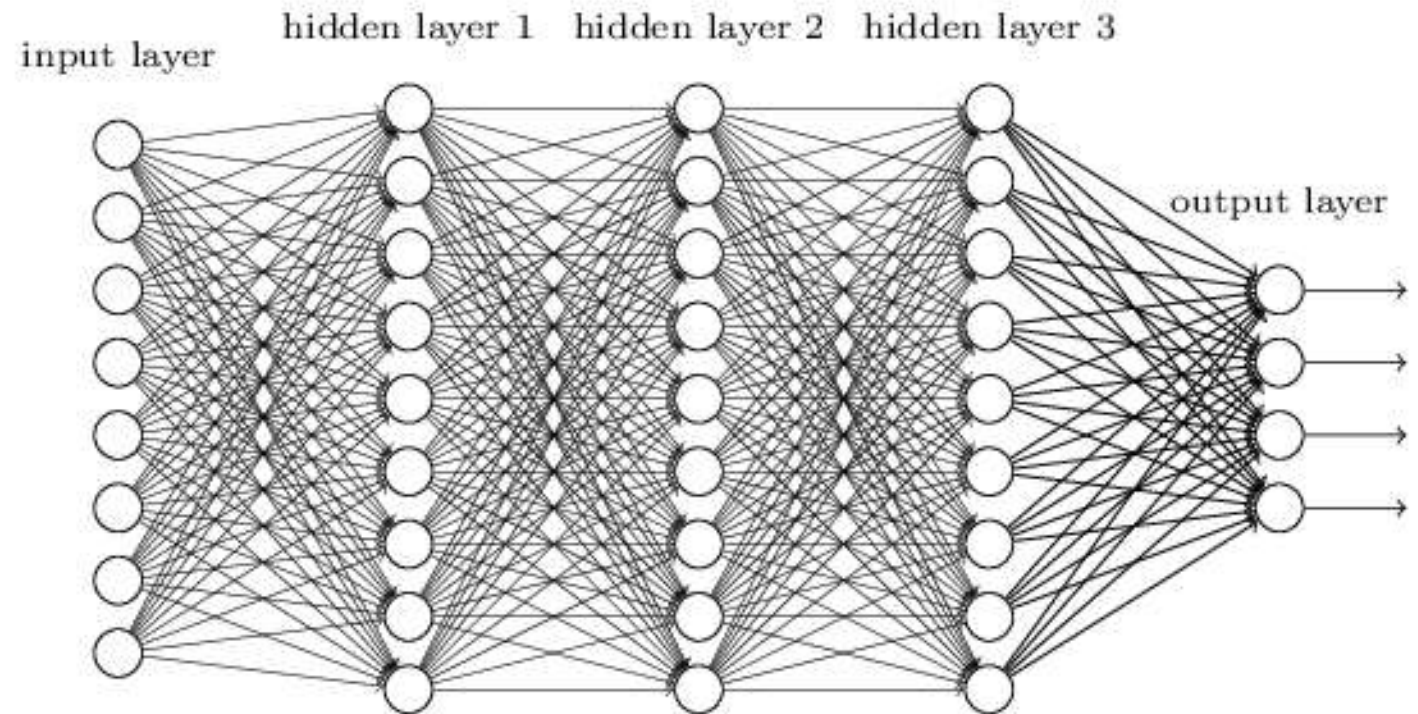




## "Non-deep" feedforward neural network



## Deep neural network

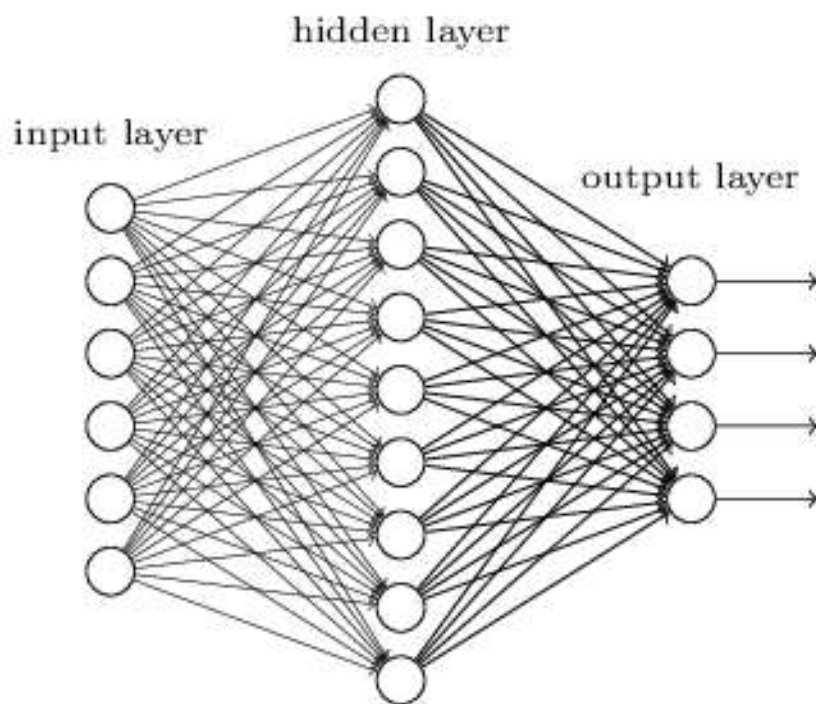


A rede neural profunda é simplesmente uma rede feedforward com muitas camadas ocultas.

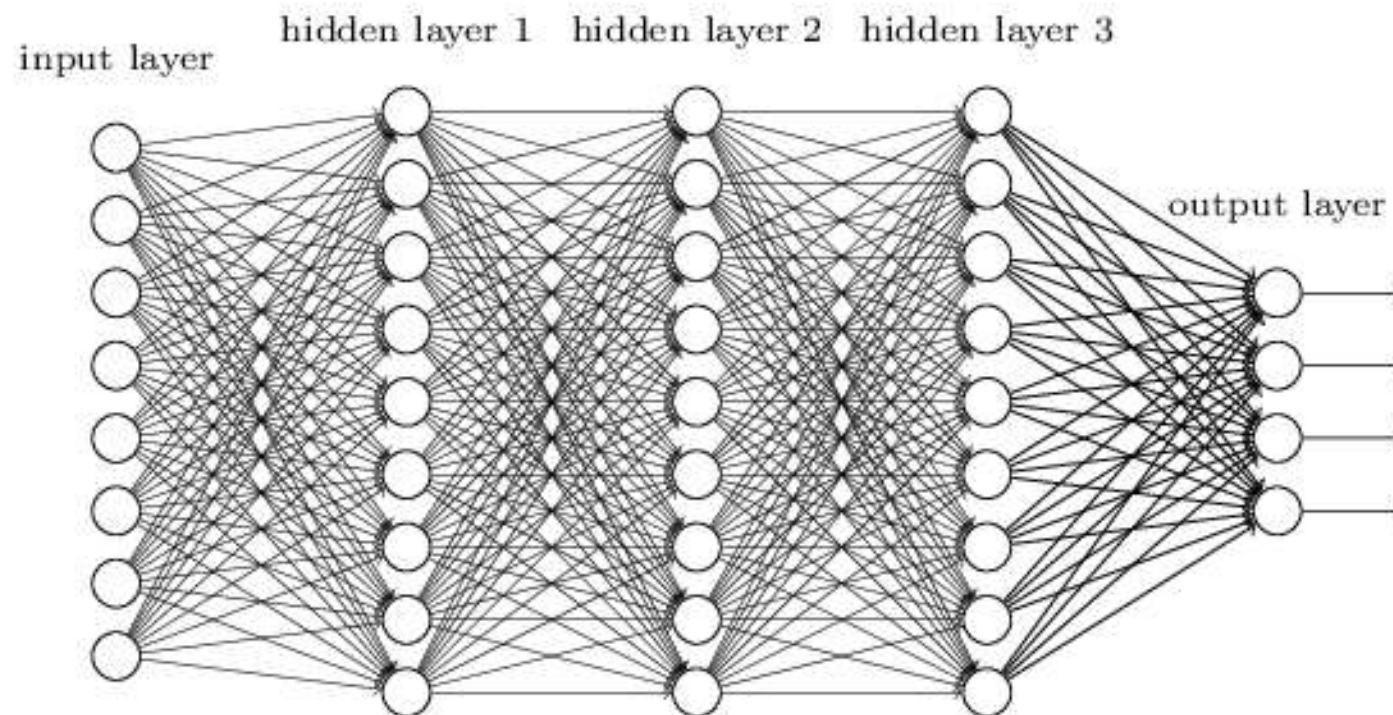




## "Non-deep" feedforward neural network

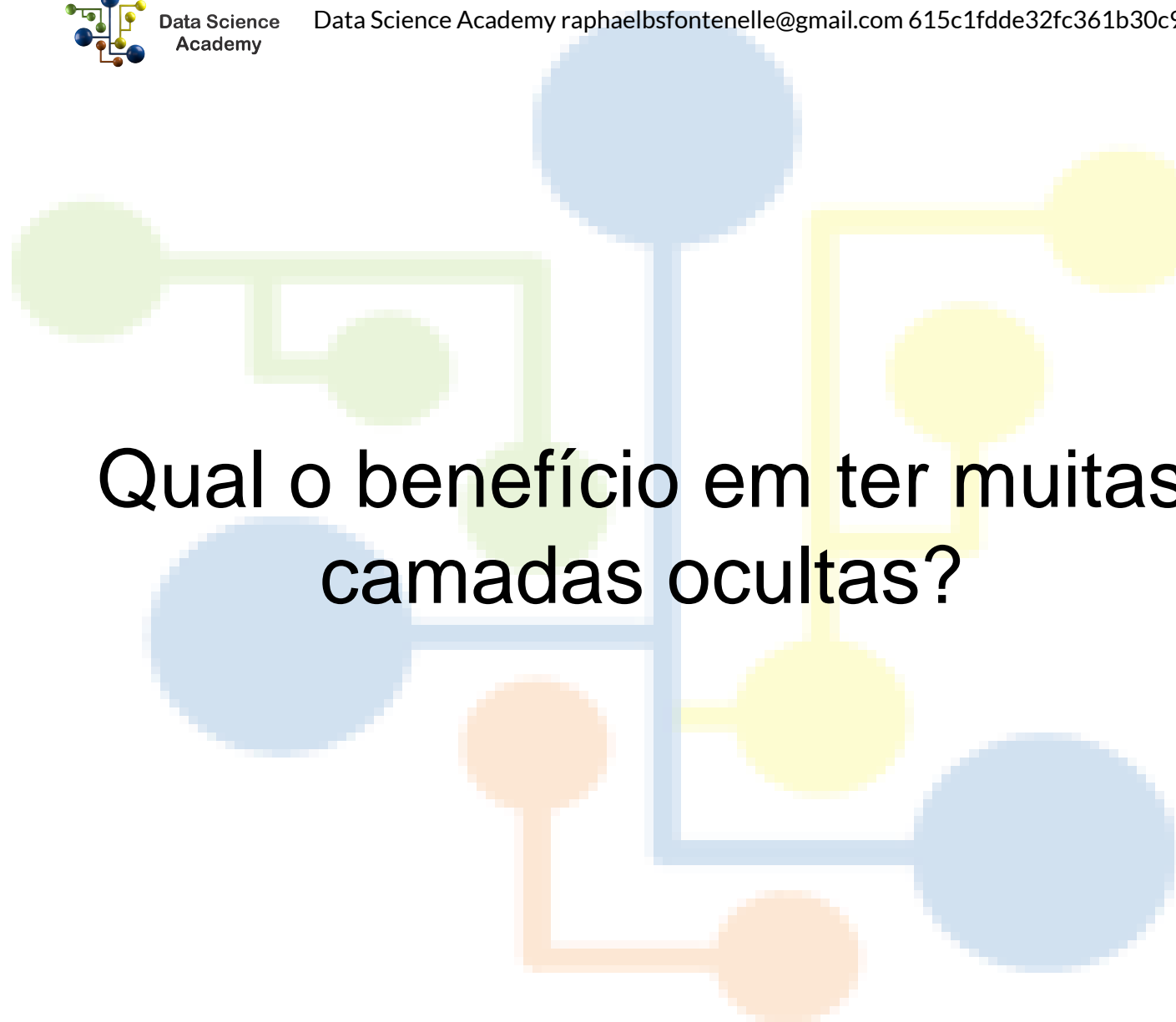
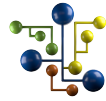


## Deep neural network



Quantas camadas uma rede deve ter para se qualificar como profunda?



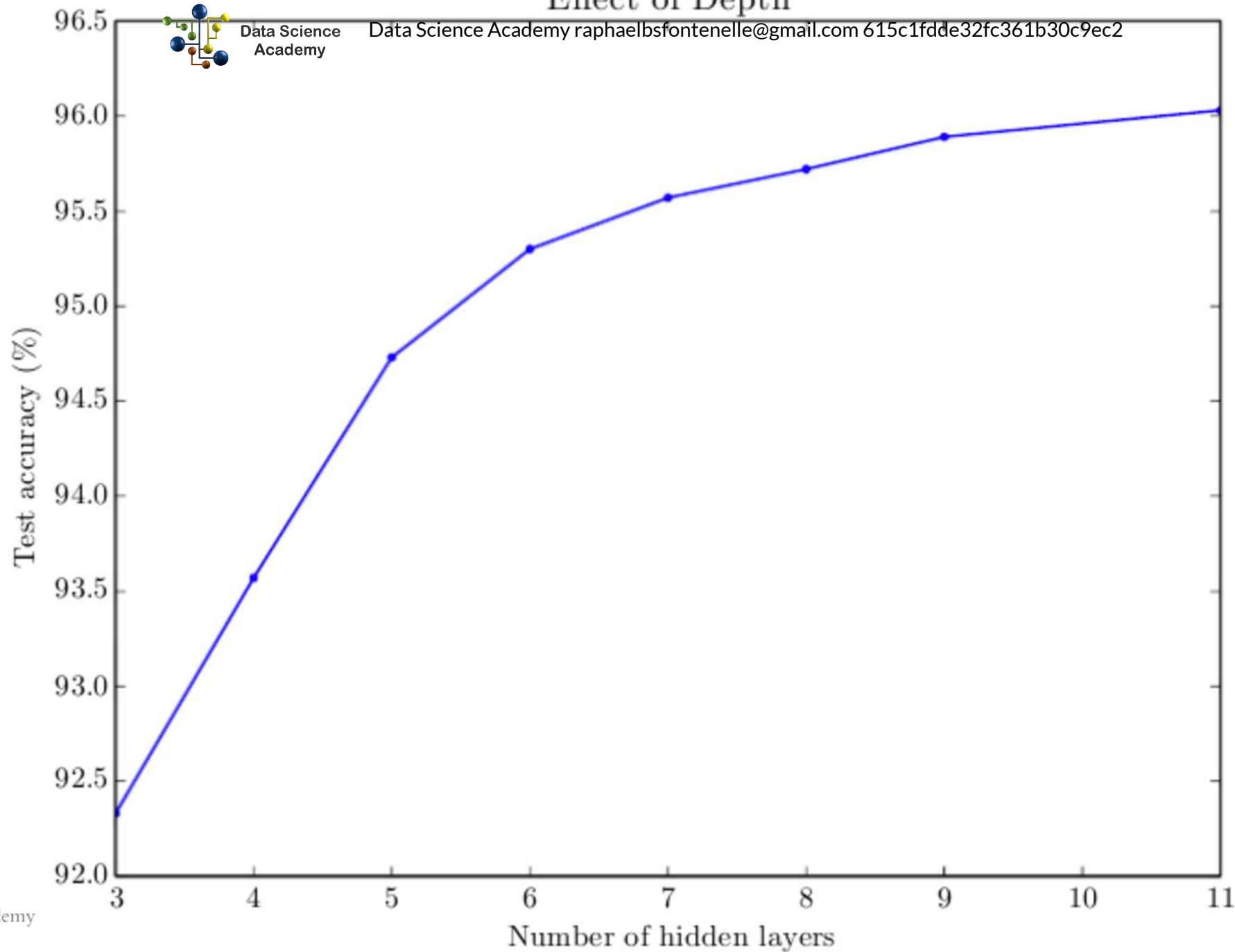
A large, faint background diagram of a neural network. It features several layers of nodes represented by circles of different colors: blue, green, yellow, and orange. The nodes are interconnected by a network of lines, with a central vertical blue line acting as a backbone. The overall structure is symmetrical and complex, illustrating the concept of multiple hidden layers.

Qual o benefício em ter muitas  
camadas ocultas?





## Effect of Depth



# Arquitetura de Conexões



# Arquitetura de Conexões



Data Science  
Academy

Data Science Academy raphaelbsfontenelle@gmail.com 615c1fdde32fc361b30c9ec2

Tipo de Conexão / Tipo de Treinamento	Supervisionado	Não Supervisionado
Sem loops de feedback	Perceptrons de múltiplas camadas (função de aproximação, classificação)	Rede competitiva, mapas auto- organizáveis (compressão de dados, separação de recurso)
Com loops de feedback	Perceptron recorrente (previsão de séries temporais, treinamento on-line)	Rede de Hopfield (memória associativa, agrupamento de dados, otimização)



# Principais Tipos de Redes Neurais





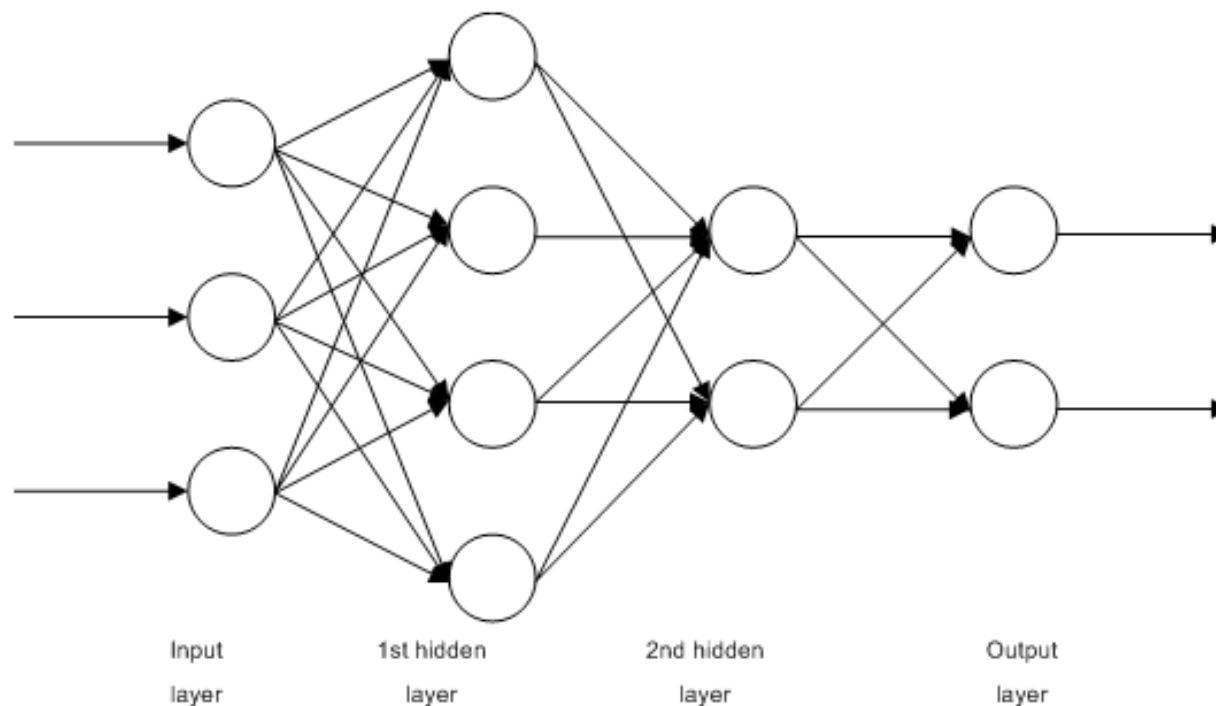
# Principais Tipos de Redes Neurais





# Principais Tipos de Redes Neurais

Redes MLP  
(Perceptron de Múltiplas Camadas)  
de Alimentação Direta





# Principais Tipos de Redes Neurais

## Redes Recorrentes Derivadas do MLP

Rede de Hopfield  
(proposta por  
John Hopfield em 1982)

Rede de Jordan  
(proposta por  
Michael L. Jordan em 1986)

Rede de Elman  
(proposta por  
Jeffrey L. Elman em 1990)



# Principais Tipos de Redes Neurais

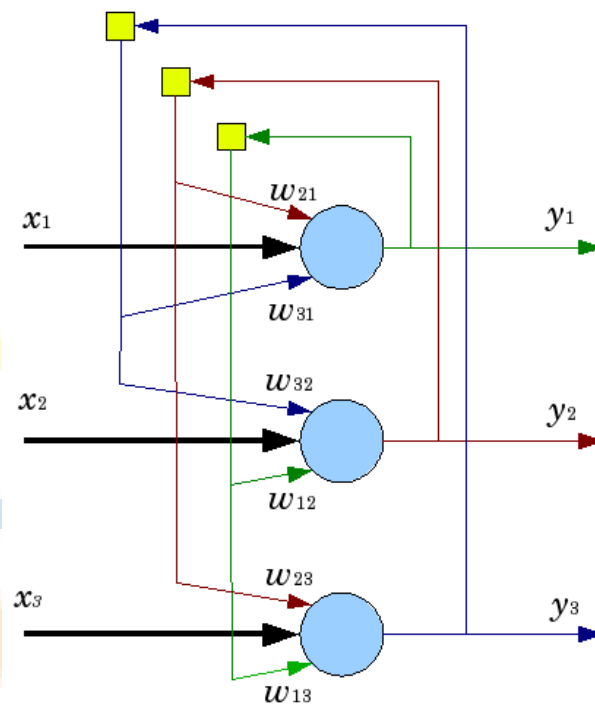


Data Science  
Academy

Data Science Academy raphaelbsfontenelle@gmail.com 615c1fdde32fc361b30c9ec2

## Redes Recorrentes Derivadas do MLP

Rede de Hopfield





# Principais Tipos de Redes Neurais

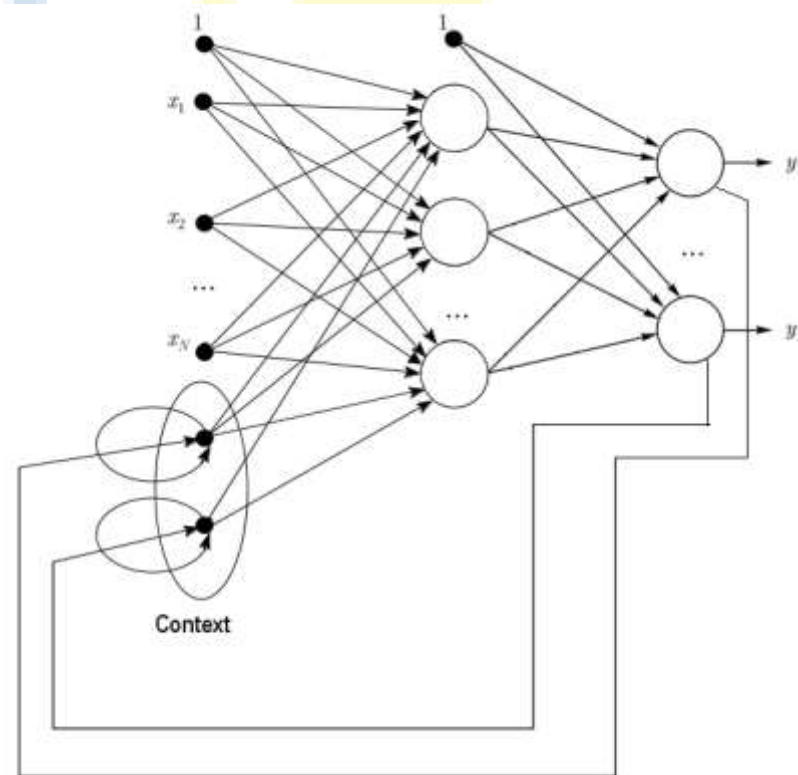


Data Science  
Academy

Data Science Academy [raphaelbsfontenelle@gmail.com](mailto:raphaelbsfontenelle@gmail.com) 615c1fdde32fc361b30c9ec2

## Redes Recorrentes Derivadas do MLP

Rede de Jordan



# Principais Tipos de Redes Neurais

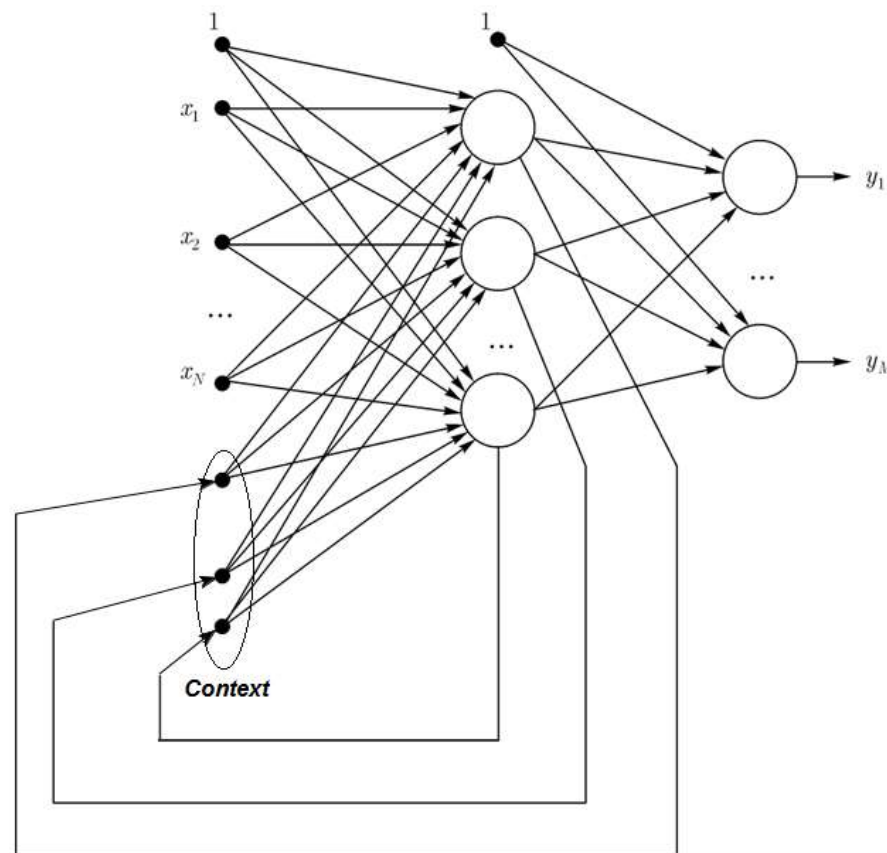


Data Science  
Academy

Data Science Academy raphaelbsfontenelle@gmail.com 615c1fdde32fc361b30c9ec2

## Redes Recorrentes Derivadas do MLP

Rede de Elman



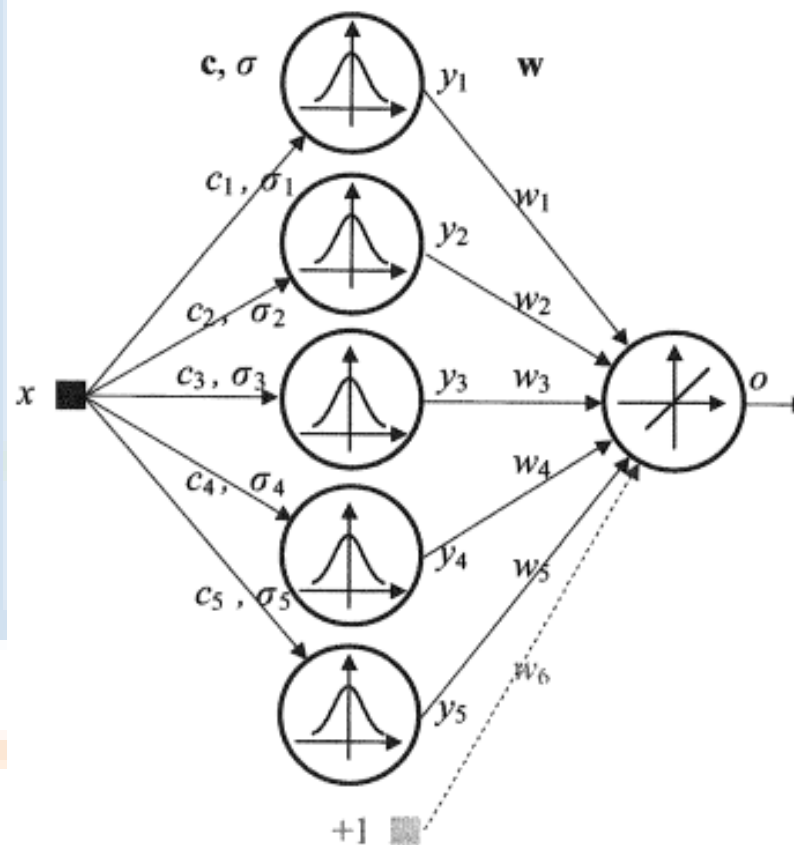
# Principais Tipos de Redes Neurais

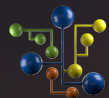


Data Science  
Academy

Data Science Academy raphaelbsfontenelle@gmail.com 615c1fdde32fc361b30c9ec2

Rede de Função de Base  
Radial (RBF)





Data Science  
Academy

Data Science Academy [raphaelbsfontenelle@gmail.com](mailto:raphaelbsfontenelle@gmail.com) 615c1fdde32fc361b30c9ec2

# Obrigado



Data Science Academy



Data Science Academy