Data Mining and Machine Learning

Assignment Project Exam Help

Types of Mttplt/plvayercPerceptron

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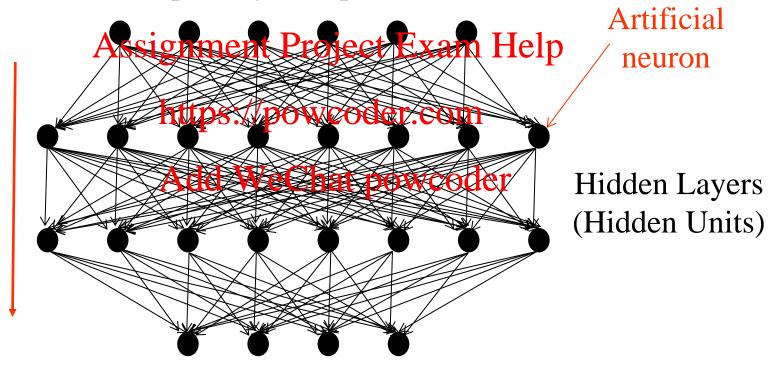
Peter Jančovič



Feed-forward Neural Networks

<u>Multi-Layer Perceptron</u> - Feed-Forward Neural Network

Input Layer (Input Units)





Output Layer (Output Units)

What can you do with a (D)NN?

- Approximate arbitrary non-linear mappings between the inputs and targets
- Learn low-dimensional representations of data (Auto-encodent petworks) oder.com
- Learn to allocate data to classes (Glassification networks)



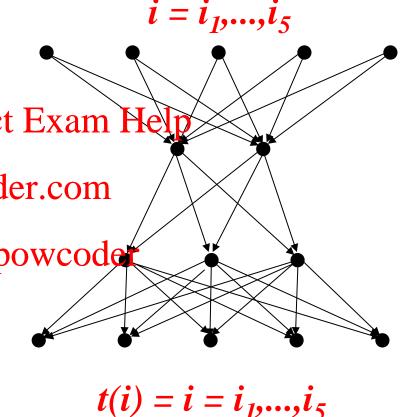
Auto-encoder (D)NNs

• During training, for each input pattern i, t(i) = i

• What's the point? Project Exam Hel

By including https://pnweoder.com hidden layers with a small number of units (a

"bottleneck") the network learns a low-dimensional representation of the data

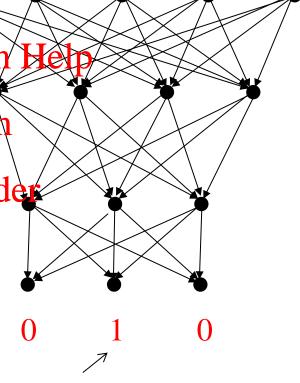


"Classification" Networks

 Suppose each pattern belongs to one of N classes

■ For each insignate and instance in the class of instance in the class

https://powcoder.com
Let t(i) be the N dimensional
vector with whose We Chat powcoder
coordinate is 1 and all other
coordinates are 0



 $i = i_1, ..., i_5$

i belongs to class 2



Deep neural networks (DNNs)

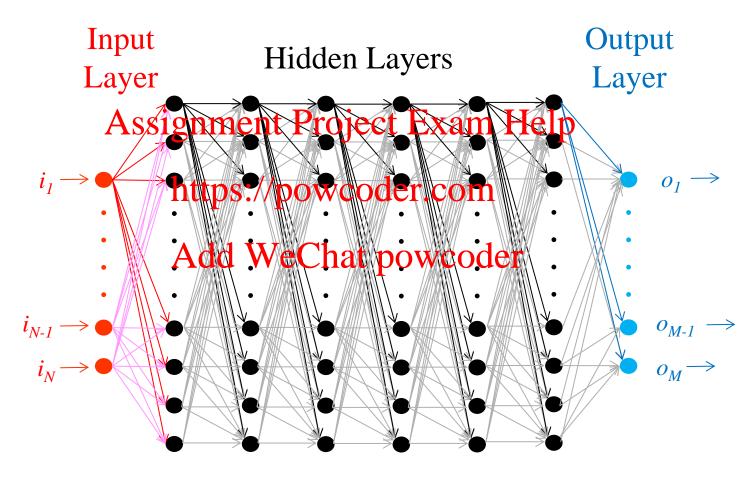
- "Deep" refers to the number of hidden layers
- In the past typically only NNs with few (1 or 2) hidden laxers were considered am Help
 - Computational considerations

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 Difficulty of parameter estimation for multiple
 - Difficulty of parameter estimation for multiple hidden layed WeChat powcoder
- Since ~2000
 - Faster computers (in particular GPUs)
- Larger training data sets

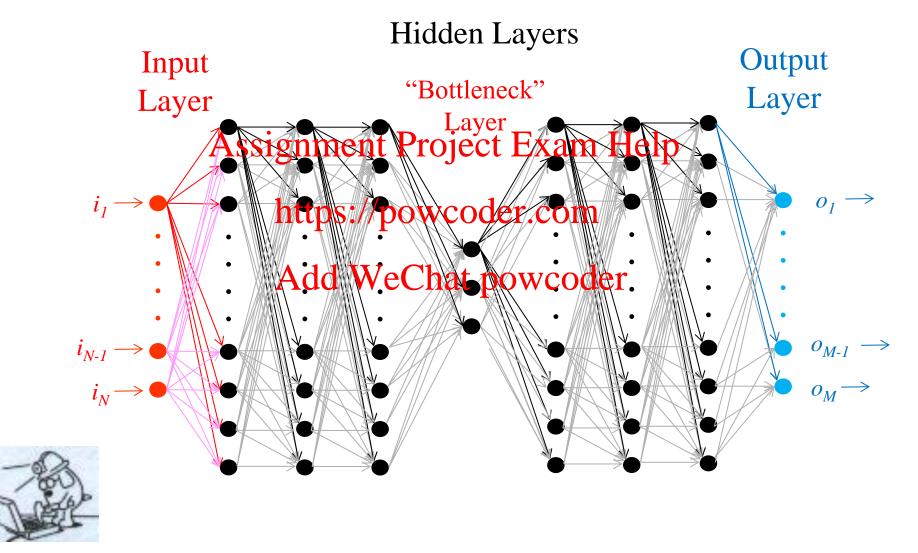
 Better parameter estimates
 - Better parameter estimation algorithms

A "deep" neural network (DNN)





"Bottleneck" DNN



THE END

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