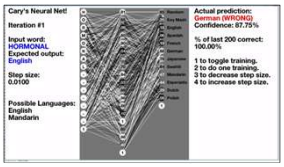
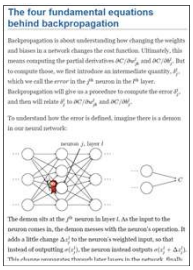
Neural networks and languages

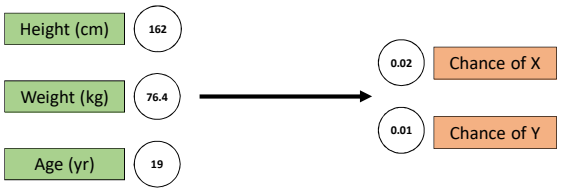


"Predicting Languages with Racist Neural Networks"
- Cary K. Huang, November 2016

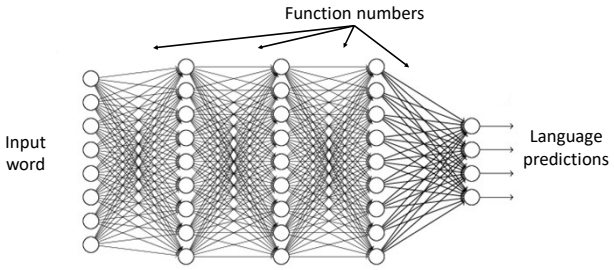


"Neural Networks and Deep Learning" – Chapter 2
- Michael A. Nielson, 2015

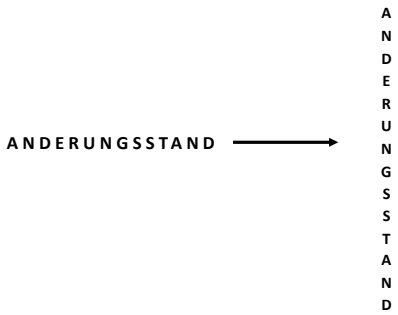
Research



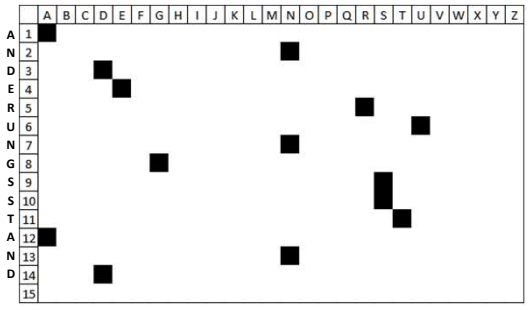
Design Principles: Functions



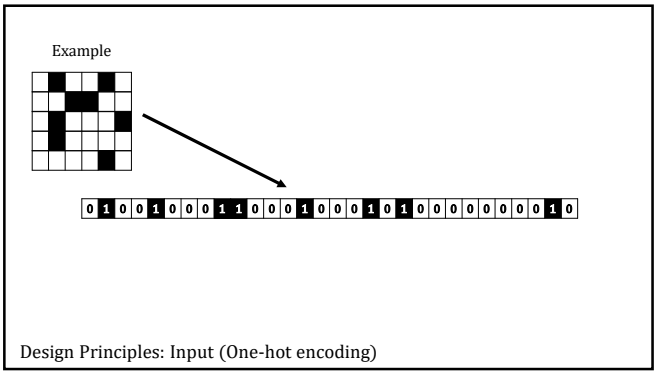
Design Principles: My function



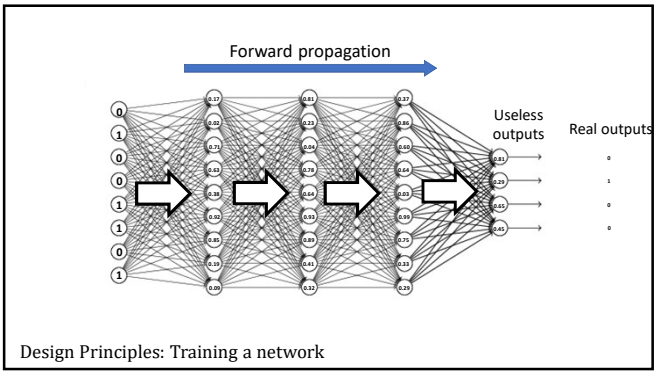
Design Principles: Input (One-hot encoding)



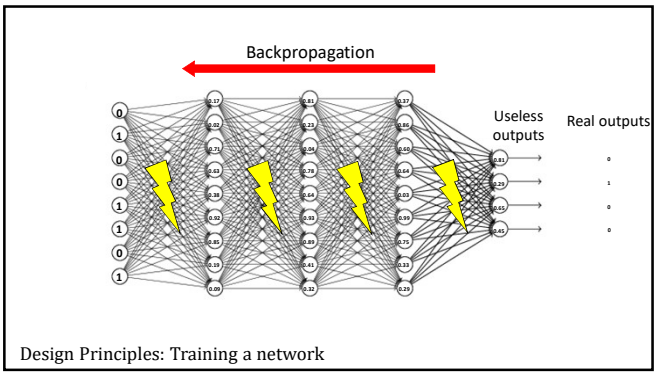
Design Principles: Input (One-hot encoding)



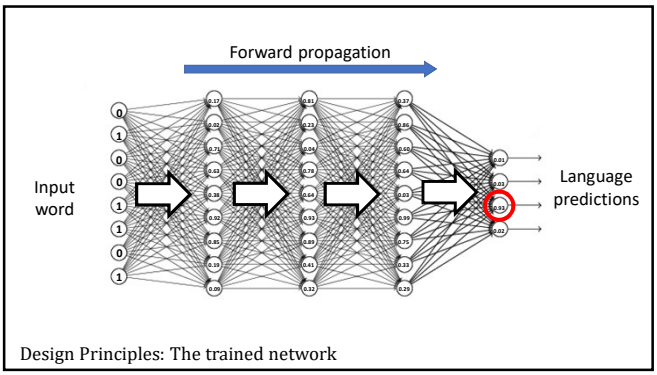
Design Principles: Input (One-hot encoding)



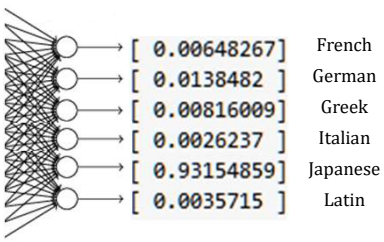
Design Principles: Training a network



Design Principles: Training a network



Design Principles: The trained network

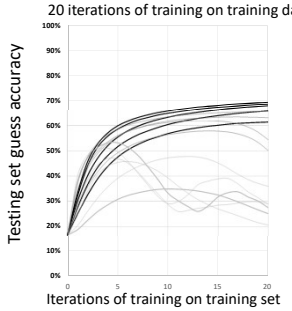


My program's output

```
Input a word and I'll guess what langauge it is.
The language must be French, German, Greek, Italian, Japanese or Latin

>>> fidelis

Guess: Latin
Confidence: 41.7%

41.7% confidence in Latin
25.1% confidence in Italian
15.7% confidence in German
10.0% confidence in French
5.0% confidence in Greek
2.6% confidence in Japanese
--------------------------------
```

Running the program

Accuracy on testing data of networks with 1 hidden layer over 20 iterations of training on training data

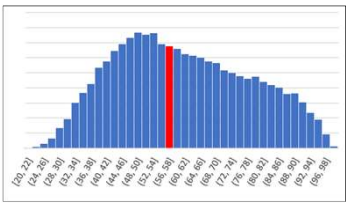


Results

Evaluation

- 69% accuracy out of these 6 languages
- Tried different styles of network
- Analysed confidences

Network Confidence



What I learnt

- Programming
- Matrix Calculus
- Collecting data
- Conclusions on data

What I could do better

- A different network model
- Activation functions
- More iterations