
**Universidade do Minho**
Escola de Engenharia
Departamento de Informática

# Mestrado Integrado em Engenharia Informática
# Mestrado em Engenharia Informática
# Computação Natural
# 2019/2020

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ISLab
Synthetic Intelligence Lab

# Computação Natural@ 2019/2020


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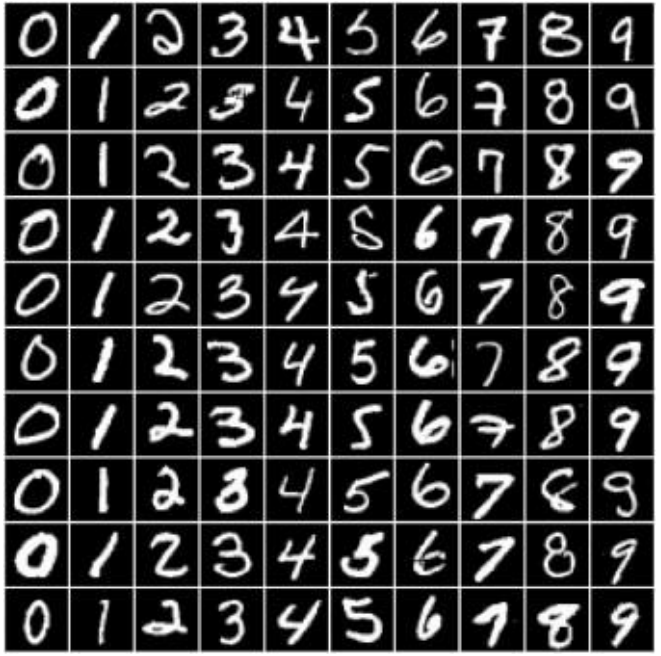
- Departamento de Informática
  Escola de Engenharia
  Universidade do Minho
- Grupo ISLab – (Synthetic Intelligence Lab)
- Centro ALGORITMI
  Universidade do Minho

# Exercise 1: Digit Recognizer / MNIST

- The dataset consists of handwritten digits images:
- Images (28 pixels x 28 pixels = 784 pixels)
- Class (integer): [0-9]

- Dataset: https://www.kaggle.com/c/digit-recognizer/data

- Target: Classify the number that represents the handwritten digits images by applying ANN (on tensorflow)
  - Use Jupyter Notebook for a step-by-step Support (found in e-learning)
  - Code Support: https://www.kaggle.com/ngbolin/mnist-dataset-digit-recognizer



# Exercise 2: Bank Note Authentication

- The dataset consists of 5 columns:
- Variance of Wavelet Transformed image (continuous)
- Skewness of Wavelet Transformed image (continuous)
- Curtosis of Wavelet Transformed image (continuous)
- Entropy of image (continuous)
- Class (integer): [0-1]

- Dataset: Found in e-learning

- Target: Classify if the Bank Note is authentic (or not) by applying ANN (on tensorflow)
  - Use Jupyter Notebook for a step-by-step Support (found in e-learning)

# Exercise 3: Iris Plants Recognition

- The dataset consists of several flower species and their respective characteristics:
- Sepal Length/Width (continuous)
- Petal Length / Width (continuous)
- Class (String): Type of Flower (1 of 3)

- Dataset: https://www.kaggle.com/uciml/iris

- Target: Classify the plant species by applying ANN (on tensorflow)
  - Code Support: https://www.kaggle.com/mchirico/tensorflow-on-iris

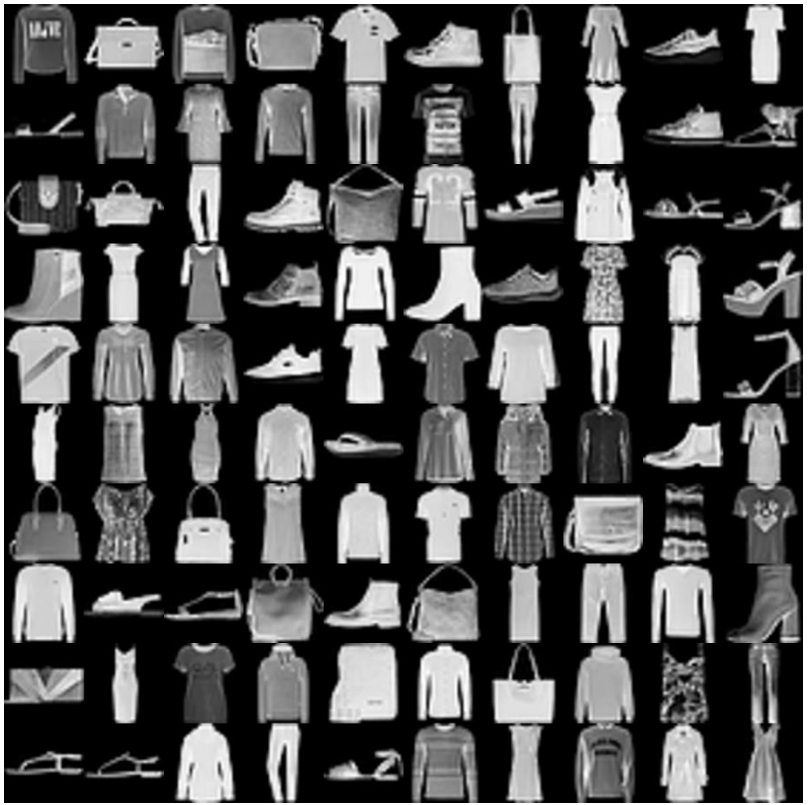
# Exercise 4: Clothes Recognizer / Fashion MNIST

- The dataset consists of black and white clothes images:
- Images
- Class (integer): [0-9]

- Dataset: https://www.kaggle.com/zalando-research/fashionmnist

- Target: Classify the cloth type by applying ANN (on tensorflow)
  - Convolution Neural Networks: https://www.youtube.com/watch?v=FmpDIaiMIeA
  - Code Support: https://www.tensorflow.org/tutorials/keras/classification

| Label | Description |
|---|---|
| 0 | T-shirt/top |
| 1 | Trouser |
| 2 | Pullover |
| 3 | Dress |
| 4 | Coat |
| 5 | Sandal |
| 6 | Shirt |
| 7 | Sneaker |
| 8 | Bag |
| 9 | Ankle boot |

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