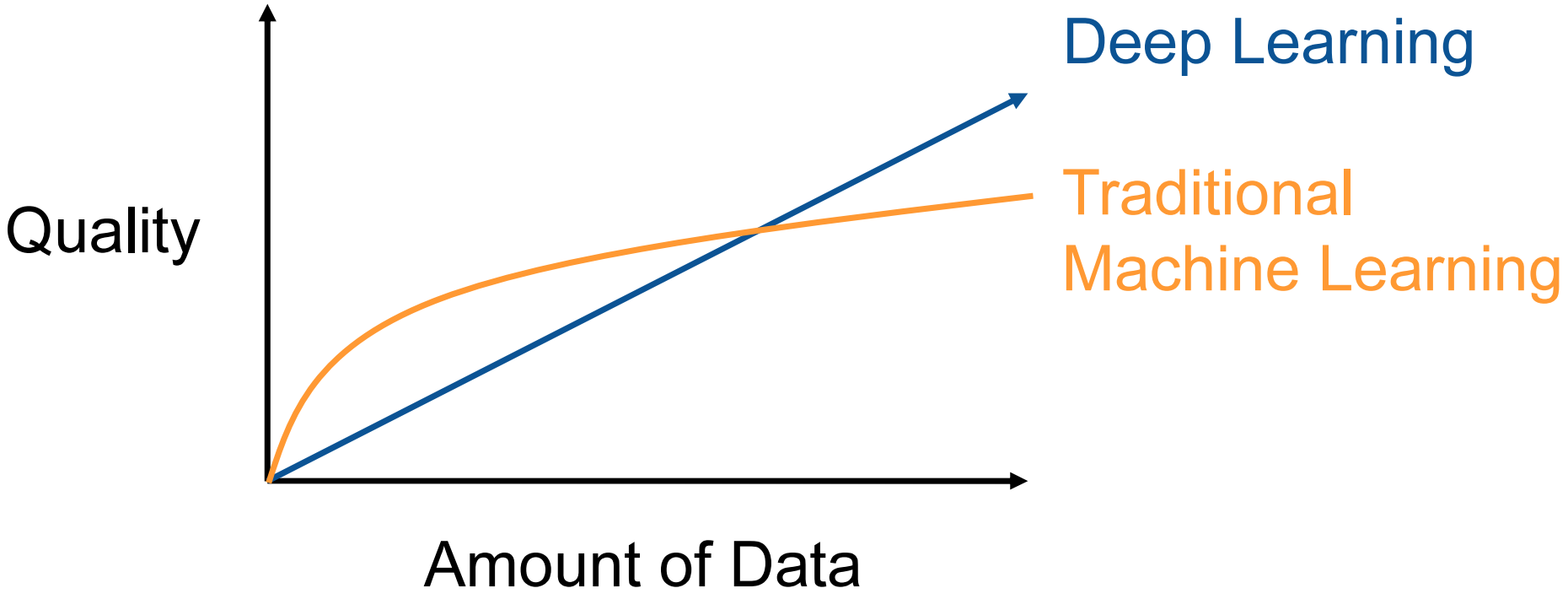
Deep Learning and Artificial Intelligence

Dr. Fani Deligianni,
fani.deligianni@glasgow.ac.uk
Lecturer (Assistant Professor)
Lead of the Computing Technologies for Healthcare Theme
https://www.gla.ac.uk/schools/computing/staff/fanideligianni

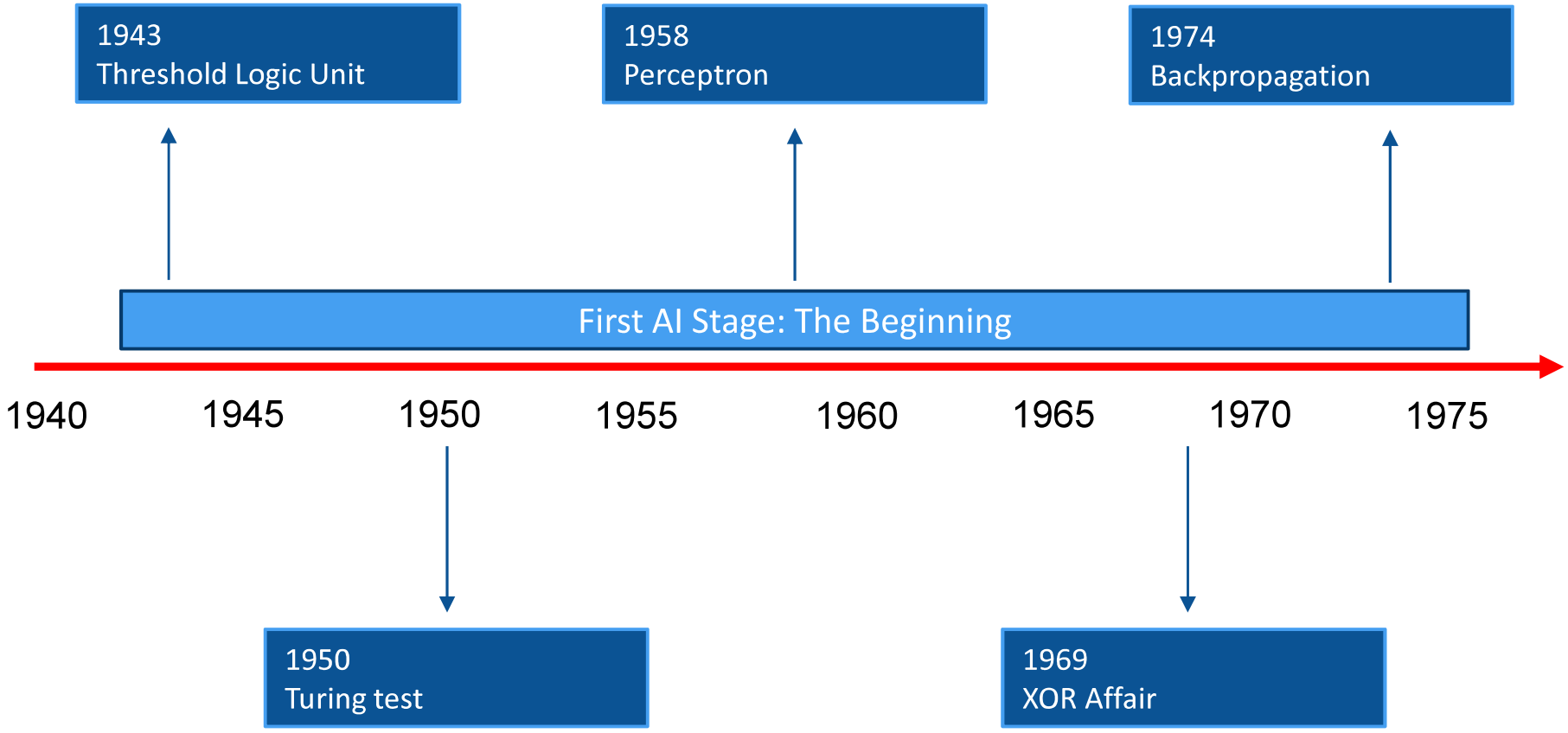
Deep Learning

- Mimic how brain neurons communicate and learn
- Allows a high level of abstraction in learning
- Eliminates the need for handcrafted features
- High demand in data and computational power

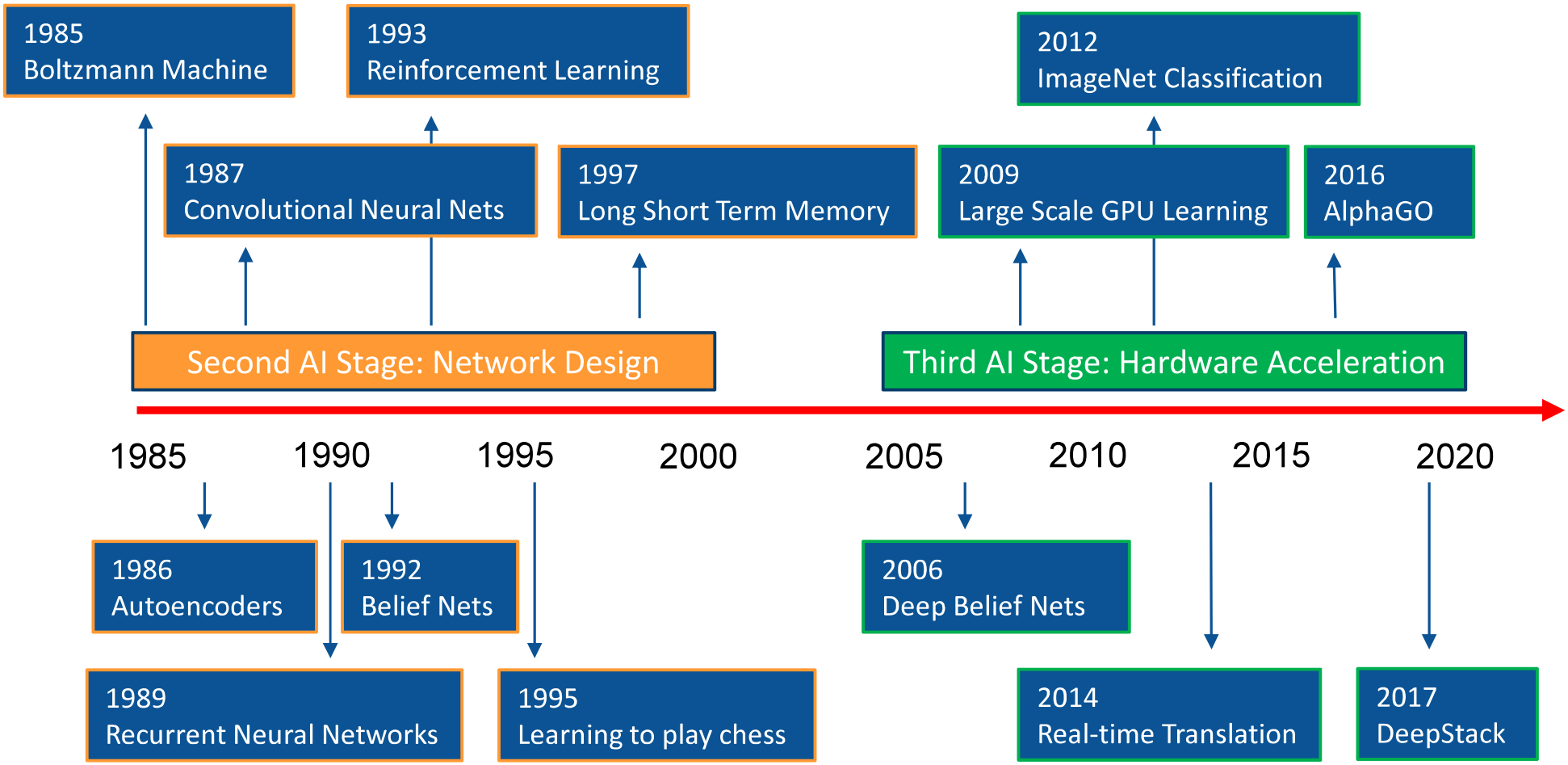
Deep Learning and Big Data



Deep Learning – Timeline



Deep Learning – Timeline



Deep Learning Software Platforms

Name	Creator	License	Platform	Interface
Caffe	Berkeley Center	FreeBSD	Linux,Win,OSX	C++, Python, Matlab
CNTK	Microsoft	MIT	Linux,Win	CMD
Deeplearning4jK	Skymind	Apache2	Linux,Win,OSX	Java, Scala, Clojure
Wolfram Math	Wolfram	Proprietary	Linux,Win,OSX	Java, C++
Tensorflow	Google	Apache2	Linux,Win,OSX	Python
Theano	Montreal Uni	BSD	Crossplatform	Python
Torch	Ronan Collobert	BSD	Linux,Win,OSX	Lua, LuaJIT, C
Keras	Franois Chollet	MIT	Linux,Win,OSX	Python
Neon	Nervana System	BSD	Linux,OSX	Python

Summary

- Deep Learning is concerned with algorithms inspired by the structure and function of the brain called artificial neural networks.
- Deep Learning models that we are going to discuss:
  - Convolutional Neural Networks (CNN)
  - Recurrent Neural Networks (RNN)

References

- Andreu-Perez et al. Artificial Intelligence and Robotic, https://arxiv.org/abs/1803.10813, 2018
- Ravi et al. Deep Learning for Health Informatics, IEEE Journal of Biomedical and Health Informatics, 21(1), 2017