

## Welcome and introduction

- ✓ **Video:** Introduction to the course  
2 min
- ✓ **Reading:** About Imperial College & the team  
10 min
- ✓ **Reading:** How to be successful in this course  
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- ✓ **Reading:** Additional readings & helpful references  
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- 🗨 **Discussion Prompt:** Introduce yourself  
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- ✓ **Video:** Welcome to week 1  
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- ✓ **Reading:** What is TensorFlow?  
10 min

## Hello TensorFlow!

### What's new in TensorFlow 2

### TensorFlow in Google Colab

### TensorFlow documentation

### Installing TensorFlow (OPTIONAL)

### Upgrading from TensorFlow 1 (OPTIONAL)



# What is TensorFlow?

TensorFlow is now a daily tool for thousands of people worldwide interested in constructing neural networks: from researchers at universities to developers in big tech companies or startups, but also including you as a student in this course. TensorFlow is a software library used for machine learning applications, especially deep learning. It uses symbolic mathematics (instead of purely numerical computations), which enables it to perform operations like automatic differentiation on a computational graph such as a neural network. Another major benefit is its ability to perform computations on GPU hardware, potentially leading to large speedups. TensorFlow is one of the most popular libraries available for this purpose; other similar libraries include PyTorch, Chainer, Apache MXNet, Caffe and Microsoft CNTK.

TensorFlow was developed by [Google Brain](#) and version 1.0.0 was released in 2017. It emerged from an earlier proprietary framework called DistBelief. You can listen to Andrew Ng discussing these early developments in an interview later in this course!

TensorFlow is released as open source software, and has contributed to the democratisation of deep learning. It has an [active community](#) of contributors, [forums and user groups](#), [blogs](#) and an active [YouTube channel](#) including tutorials, presentations and interviews. This means that more and more people can share their code and tackle problems together in application areas as varied as medicine, NLP, finance or computer vision.

The latest release of TensorFlow 2 makes use of the Keras API as the default high-level abstraction to easily construct and customize neural networks, forgetting about the nitty-gritty algorithms written in C++ that are running behind the scenes. This greatly simplifies the numerical implementation for the user, resulting in a faster and intuitive algorithm implementation. You just need a few lines of code to define a cutting-edge convolutional network to identify objects in the street, or to build a recurrent layer to perform sentiment analysis on the tweets of your favourite politician.

Another fundamental feature of TensorFlow is its ability to develop and deploy models in multiple platforms and environments. The [TensorFlow ecosystem](#) supports development in Python, JavaScript or Swift, with data preprocessing and model building and training pipelines. If you