

# Deep Learning with Keras for R

## Overview

Deep learning with neural networks has changed the way many machine learning problems are now solved, but until recently was difficult to use outside of large research groups. The Keras deep learning library has dramatically reduced the barrier to entry by providing a simple interface to lower level libraries, such as TensorFlow or Theano. This hands-on workshop will guide you through creating neural networks with the R interface to Keras. We will cover some theoretical background and discuss the types of problem for which neural networks are appropriate. The focus is on implementation, and you will build your own networks in guided exercises.

## Prerequisites

Attendees should be familiar with the R language, and comfortable manipulating R data structures, such as matrices and arrays.

## Outline

### Introduction to Deep Learning

- What is deep learning
- What types of problem can it solve
- What are Keras and TensorFlow

### First Keras Model

- Getting your data into the right shape
- Models and layers
- Feed-forward neural network (dense layers)

### Models for Spatial Data

- Types of network architecture and the problems they solve
- Convolutional Neural Nets (CNNs)
- Preparing spatial data for CNNs
- Example with sliced time series data

Workshop 2: Deep Learning with Keras for R  
September 10<sup>th</sup> 2019, 10am

## Facilitators

**Doug Ashton, Mango Solutions**