Ashley Polhemus, Sona Hunanyan, Prof. Mark Robinson Spring Semester 2020
Methods Seminar **To be discussed on Wednesday 11 March 2020, 15:00–16:00**

Exercise sheet 1 - Methods Seminar: Deep Learning

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1. Problem 1: After you have installed `keras` load the MNIST data by

```
mnist <- dataset_mnist()
```

   (a) Following the exercise discussed in-class rerun your first neural network.

   (b) Change the activation functions for the layer (s) of the network and explore the change of the results.

   (c) Compile the model with appropriate optimization methods.

   (d) Is there an impact of change of the number of `epochs` and `batch_size` on the results?

2. Problem 2: Split into two groups.

   We often hear about the power and promise of machine learning, but how much of that is real? How much can we realistically expect of deep learning models, and when should we be skeptical? Before developing and interpreting deep learning models, it is important to understand both the value and potential harms they can bring.

   Group 1: Quickly review slides 1-10 of the deck "How to recognize AI snake oil". As a group, discuss:

   - What are some of the things that current AI realistically can and cannot do?
   - As biostatisticians and epidemiologists, how does this affect they way you might design and interpret research using AI?

   Group 2: Quickly review slides 11-20 of the deck "How to recognize AI snake oil". As a group, discuss:

   - What are some of of the shortcomings of AI with regard to predicting social outcomes?
   - How might AI impact social policy development or legal frameworks? Would impacts be positive or negative?
   - As biostatisticians and epidemiologists, how does this affect they way you might design and interpret research using AI?