- 1002 MIT科研

- [ ] times new roman ; double space ; 12号字
- [ ] ED: https://edstem.org/us/dashboard;
- [ ] 必修课程：
  Opening Lecture 1
  Sunday, May 15th, 2022 12:00-14:00 pm China Time
  Opening Mentor Session 1
  Sunday, May 22nd, 2022 8:00-9:30am China Time
- [ ] 吴恩达已学习到 57，118
- [ ] 讲稿：

1. First of all, an illustrating example of S2S model might be the translation machine (it connects two LSTM NN with the first being the encoder and the second being decoder). E.g. the picture depicts how an English sentence is translated to the German sentence. Here we get from the English sentence the finial state (the one- hot vector contains all of the information of the English sentence)and then to the decoder.
2. Here's attention mechanism which settles for the problem that long-term dependence. You see we can compute the characteristic vector S_j by averaging them with the same coefficients alpha_j from the soft-max function with input the matrix multiplication of parameter matrix K and the query vector q (So we can convince ourselves that the idea is that we can allocate the attention so as to make S_j gather all of the information of the encoder)
3. Keep abstracting the idea we can construct the attention layer on any CNN without restriction to the S2S model, and the implementation is as follows, parametric matrices containing the parameters (attention: not hyper parameters) to get more abstract vectors and then average them with the same coefficients from the soft-max function.

- [ ] 一些好的问题与想法：

1. https://www.zhihu.com/question/61607442
2. 这个漫画，很形象地解释了一种全新的 认知模型。其实机器学习 MI，跟真人智能，还是有差别。机器学习，可以通过海量的数据吞吐和超人计算能力，实现模式识别——从而建立一套与人不同的 “认知逻辑”。它不一定跟人要一样，或者很多时候跟人完全不一样

- [ ] 深度网络训练出概率＋最后一层为贝叶斯网络

1. 贝叶斯网络的因果设计是根据主观还是客观?

- *the decision boundary should go across the real data distribution for a successful GANs learning.*
- *It penalizes the fake samples (in color magenta), and as a result, it forces the generator to generate samples toward decision boundary*

- CNN-LSTM
- heres another idea

1. Inspired by the article below, implemented by CNN and LSTM I will be trying to solve the identification of the protein sequence (named five-member polo like kinase family) which is the potential cause of anti-cancer-drug attributes.
2. The two open dataset can be downloaded from website, both of which are composed of the sequence as in the fig2 below.
3. Recall that CNN can effectively extract and learn features from one-dimensional sequence data (such as univariate time series data).
4. And in real cases, the CNN model can be used in a hybrid model with an LSTM backend, where CNN is used to interpret the input subsequences, which are provided to the LSTM model as sequences for interpretation. This hybrid model is called CNN-LSTM.
5. For the present situation, we apply CNN for spatial temporal relations and LSTM for sequential classification.
6. From the article, changing of the numbers of convolutional layers and the Adam-stochastical-optimazation algorithm are applied for the particularly trained model, whose precision are shown in the table below. We can see the precision of final stage approximates 100 percent.

- 改进feas_solu()函数，使算法运行顺利
- 项目分为：生物+深度学习