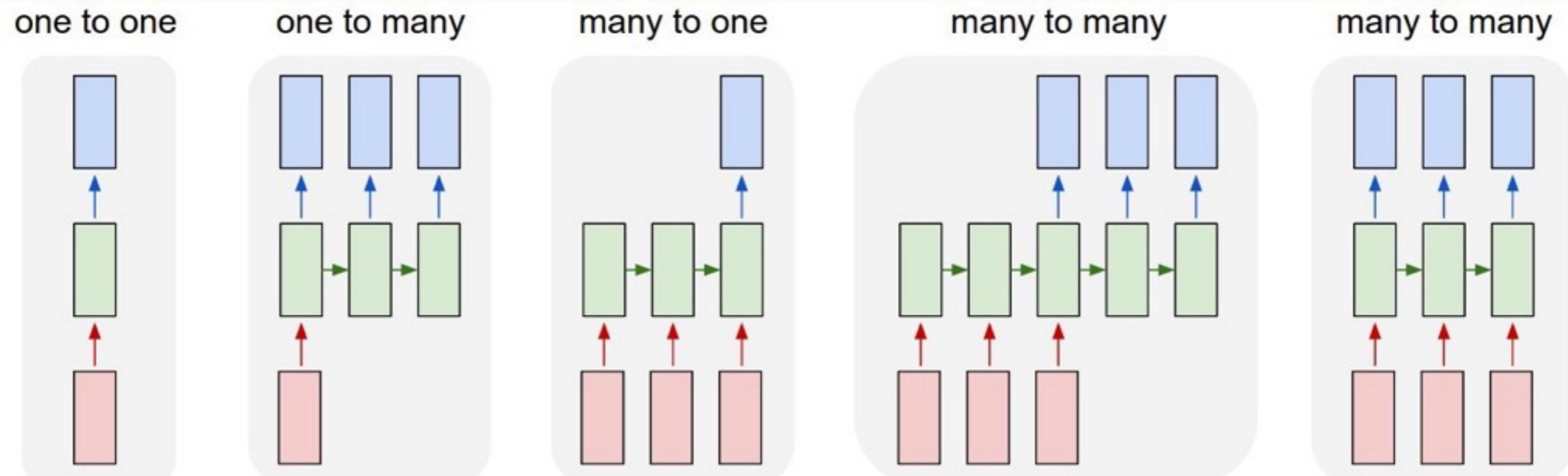


Kerasで時系列学習

RNN

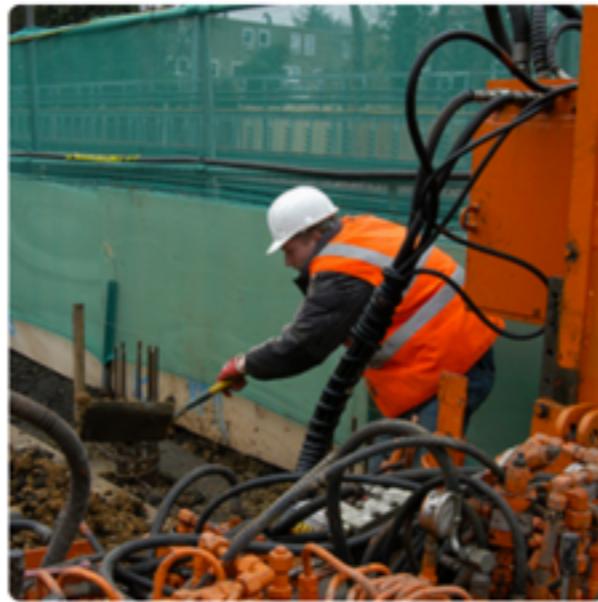
- The Unreasonable Effectiveness of Recurrent Neural Networks by Andrej Karpathy
- Awesome Recurrent Neural Networks



Multimodal Recurrent Neural Network



"man in black shirt is
playing guitar."



"construction worker in
orange safety vest is
working on road."



"two young girls are
playing with lego toy."



"boy is doing backflip on
wakeboard."

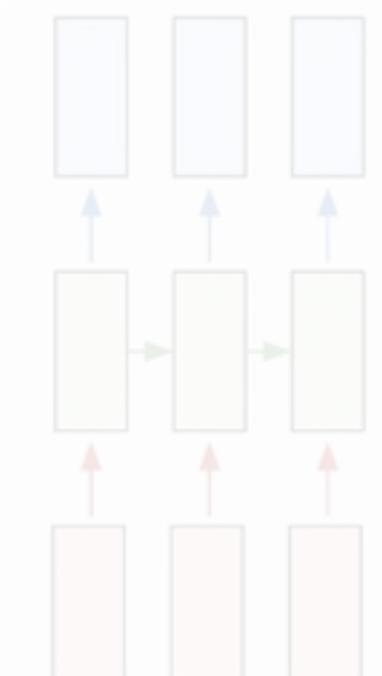
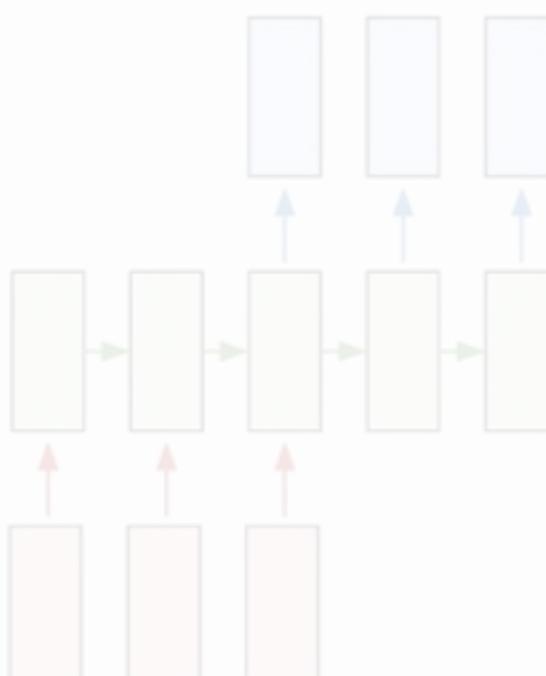
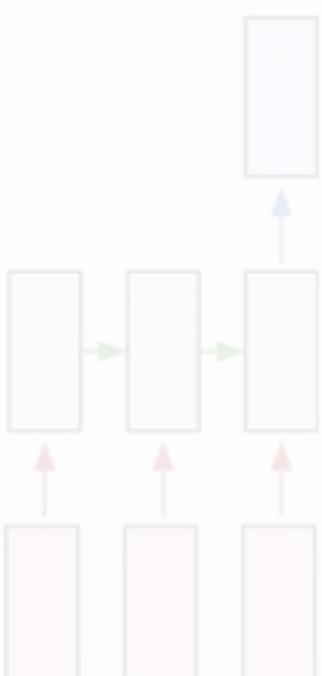
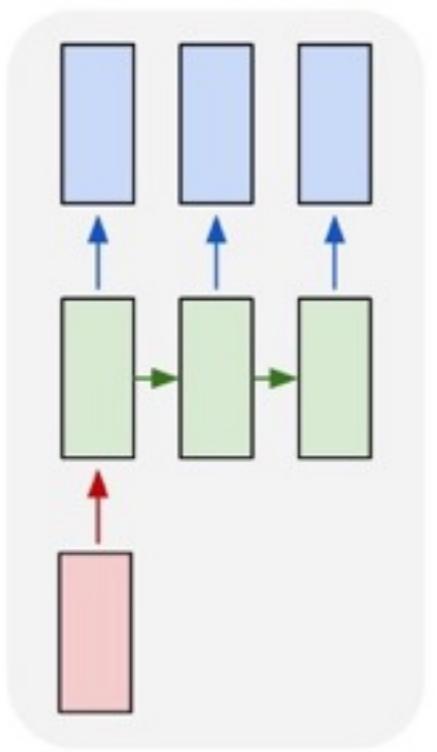
one to one

one to many

many to one

many to many

many to many





Generated story about image

Model: Romantic Novels

"He was a shirtless man in the back of his mind, and I let out a curse as he leaned over to kiss me on the shoulder.

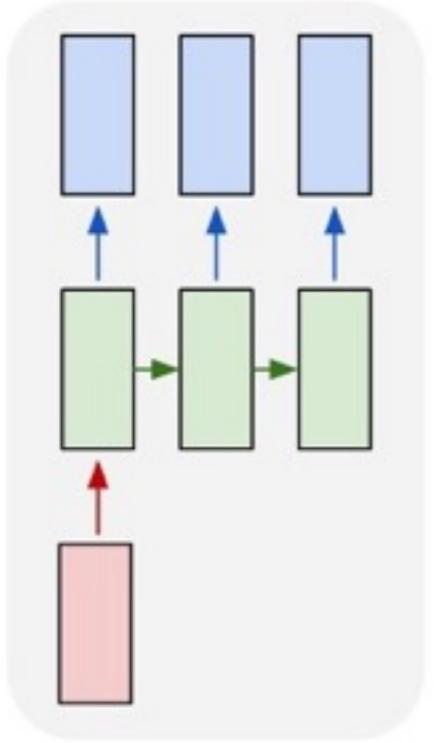
He wanted to strangle me, considering the beautiful boy I'd become wearing his boxers."

<https://github.com/ryankiros/neural-storyteller>

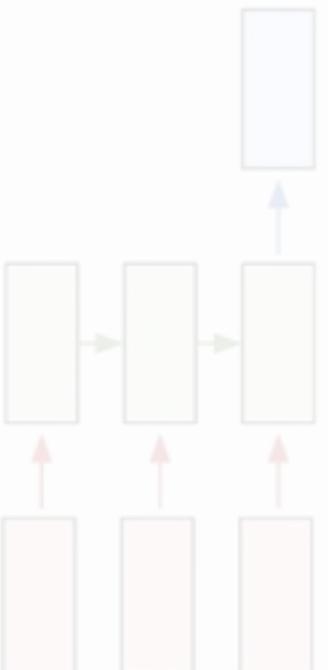
one to one



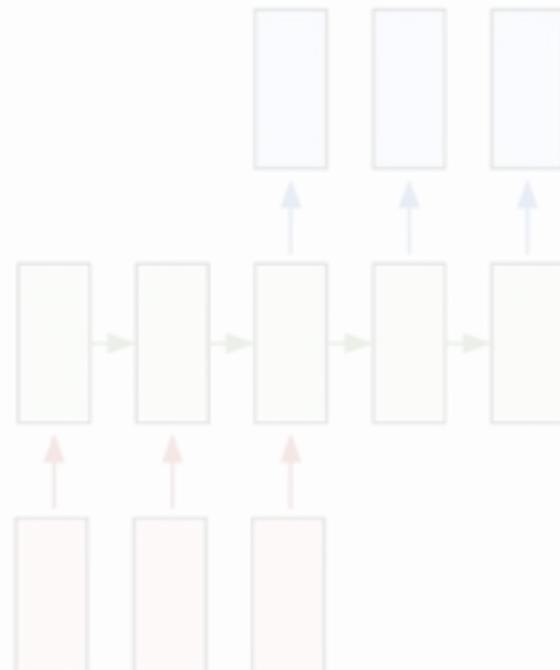
one to many



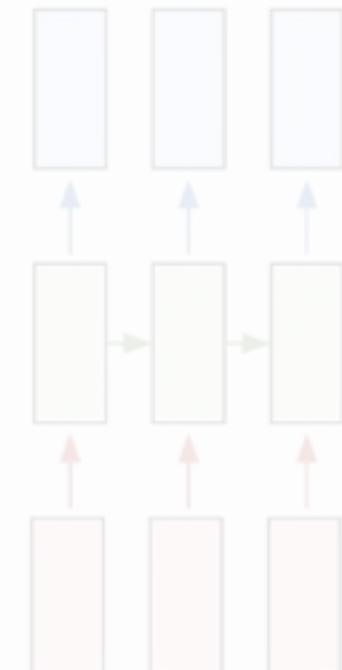
many to one



many to many



many to many



dhyanchand Sentiment Analysis

There is no doubt about Sachin Tendulkar, He is a grt player & he deserves BHARAT RATNA. But what about Dhyanchand, Milkha Singh & P T Usha?

BHARAT RATANA to Dhyanchand would have been better decision instead of Sachin Tendulkar

India's pride Sachin bestowed Bharat Ratna. Congratulation! But, grave injustice had done with Hockey wizard Major Dhyanchand.

Giving bharat ratna to sachin means that govt is influenced by media,there were 3-4 more deserving sportmen like dhyanchand,kapil,gav,paes

Hockey wizard Dhyanchand played for British Raj. He represented a British Commonwealth colony, how can we give him Bharat Ratna.

I would like to congratulate Bharat Ratna recipient, but Mr. Dhyanchand and Mr. Amitabh B deserves dis award more den him.....

@ajitak sachin is the best cricketer .but don't deserve bharat ratn bcs msr dhyanchand ,mhd rafi,etc .should b ? think some thing

Its a disgrace that best sportsman of Indian history Major Dhyanchand is not conferred Bharat Ratna.

sachin Sentiment Analysis

@ThankYouSachin SACHIN WE MISS U IN WORLD TEST CHAMPIONSHIP IN AUSTRALIA..U RA GOD OF THIS CRICKETING FRATERNITY #bcc1 @ThankYouSachin

#Sachin: I am fully happy with the decision that I made and I believe it's the correct decision

SACHIN WE MISS U IN WORLD TEST CHAMPIONSHIP IN AUSTRALIA..U RA GOD OF THIS CRICKETING FRATERNITY .@ #thankyousachin

Sachin is a great crickter in world

Sachin Tendulkar !! U will be missed !! But still in our hearts forever #ThankYouSachin @BCCI #SRTFOREVER

#Sachin Tendulkar has ended his Test career at 18th spot in the latest ICC Test batsmen rankings.#Cricket

You are the reason for me to love the sport, learn the sport and become a good batsman. Sachin the "GOD of Cricket". #ThankYouSachin

@BCCI :Sachin is a true legend and a very good human being.Best wishes for the future life.#ThankYouSachin

<https://blog.openshift.com/day-20-stanford-corenlp-performing-sentiment-analysis-of-twitter-using-java/>

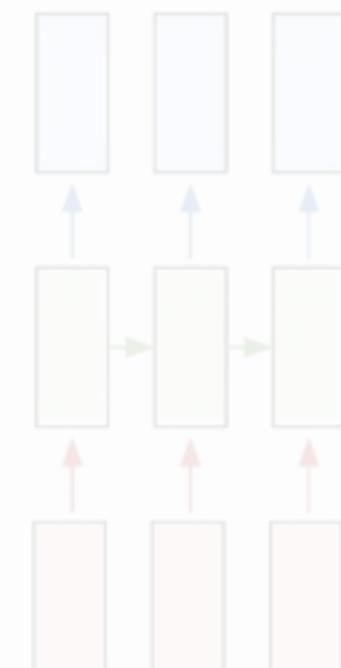
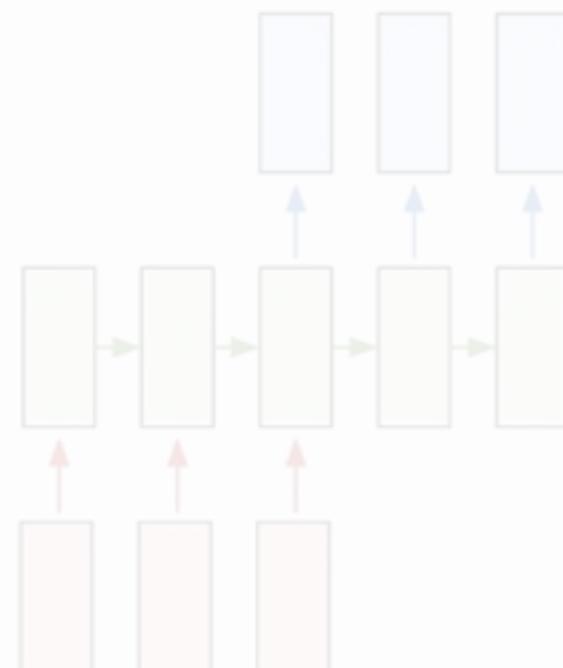
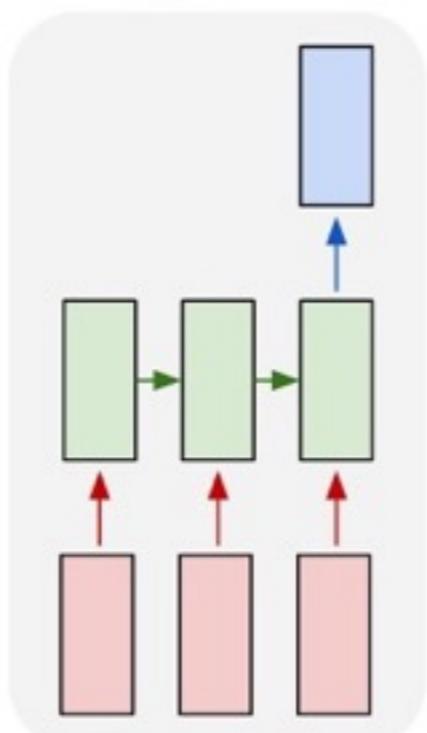
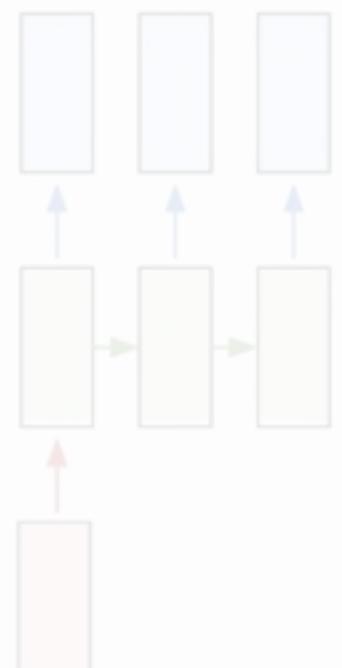
one to one

one to many

many to one

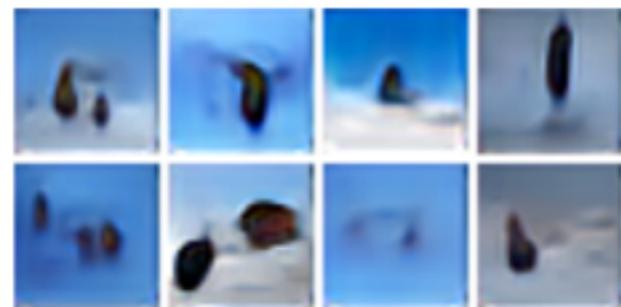
many to many

many to many





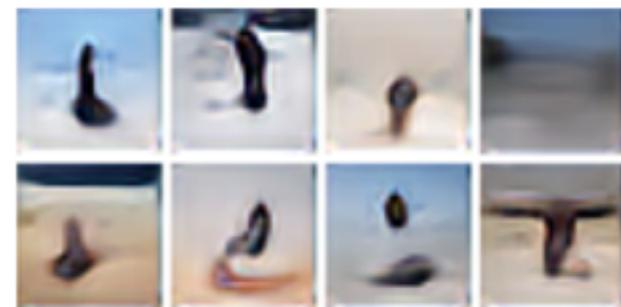
A stop sign is flying in blue skies.



A herd of elephants flying in the blue skies.



A toilet seat sits open in the grass field.



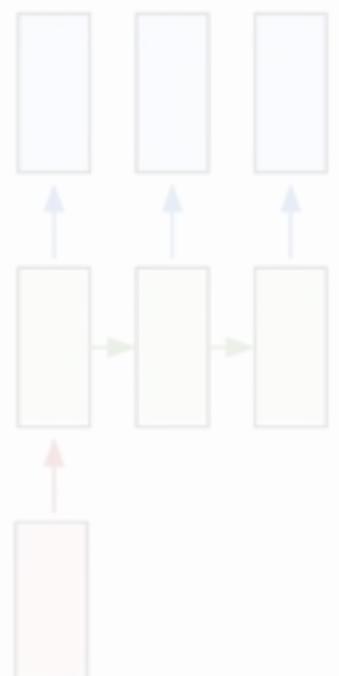
A person skiing on sand clad vast desert.

Mansimov et al. 2016

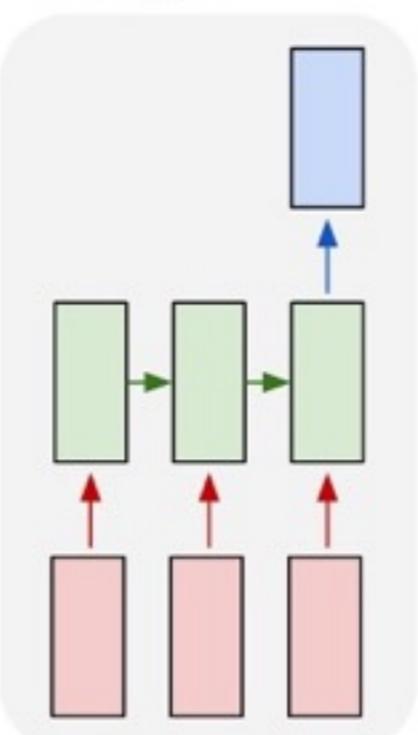
one to one



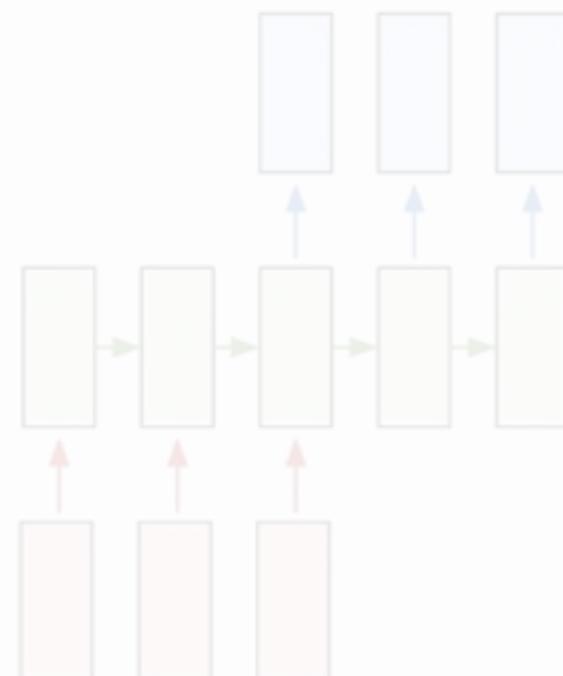
one to many



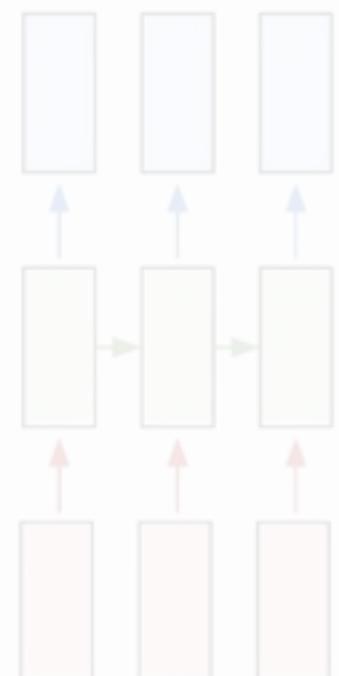
many to one



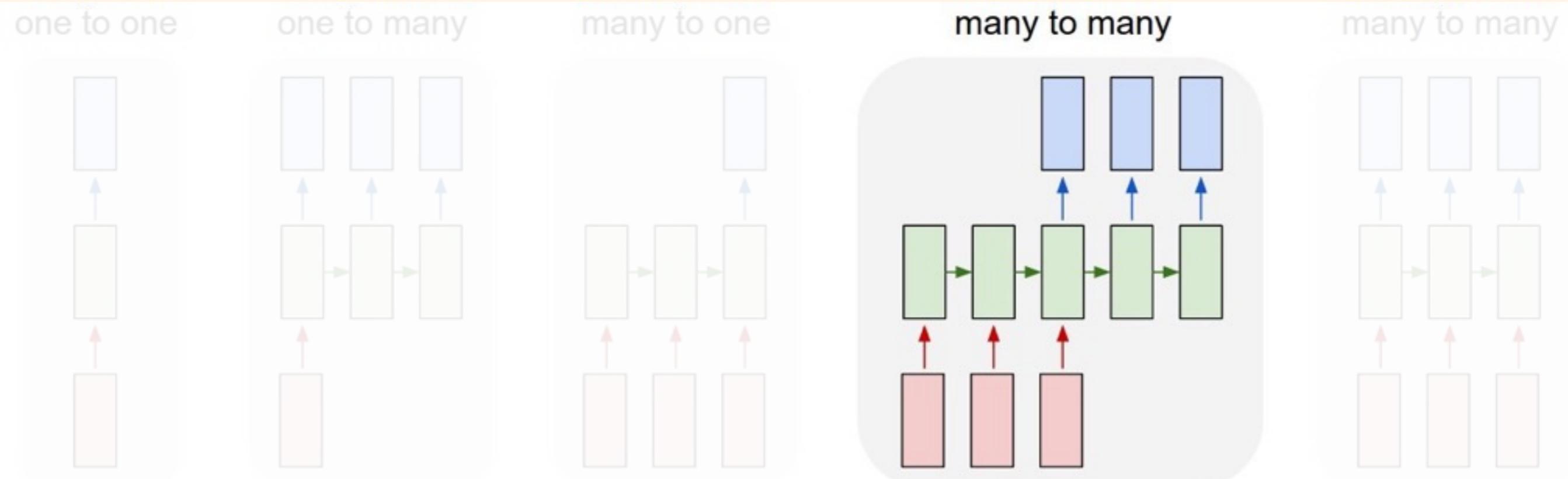
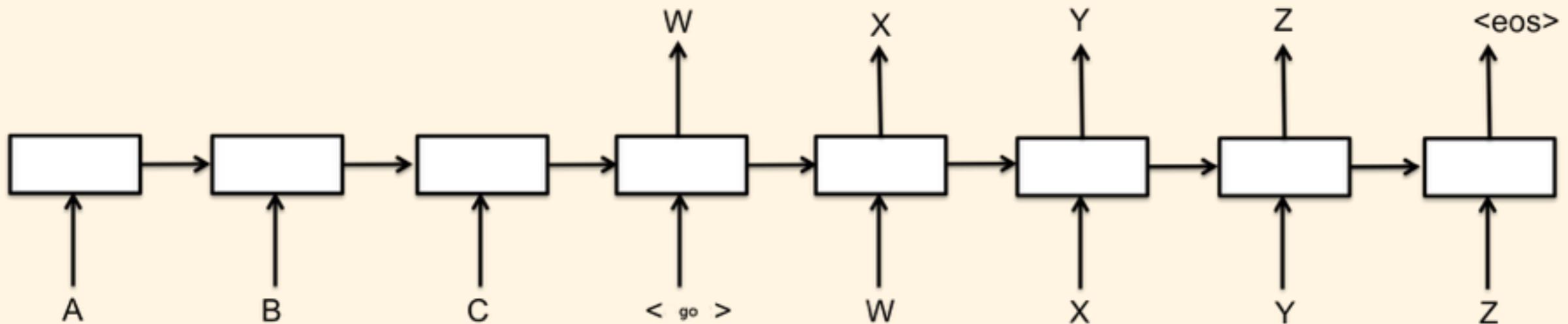
many to many



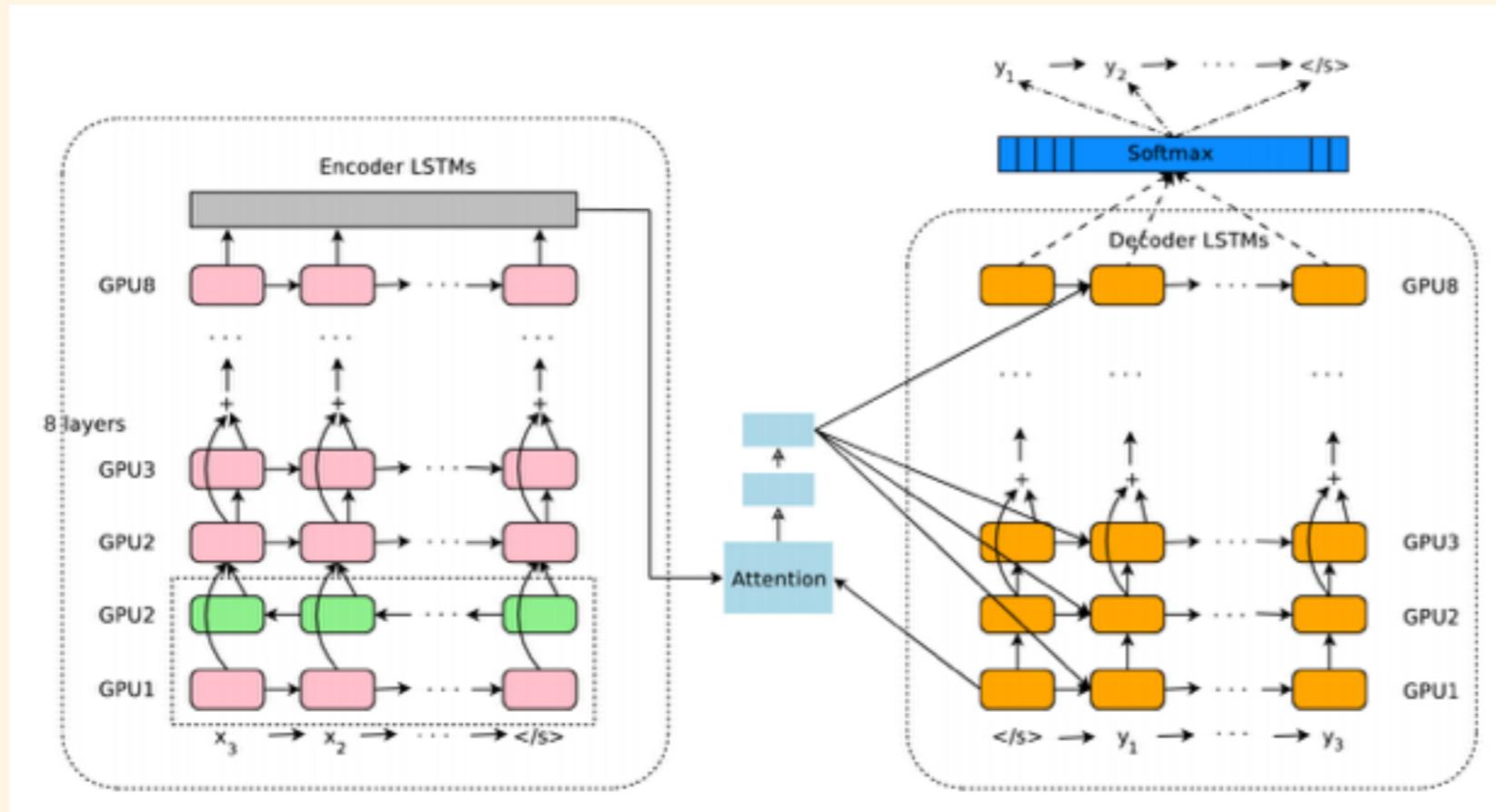
many to many



Sequence-to-Sequence Models in TensorFlow



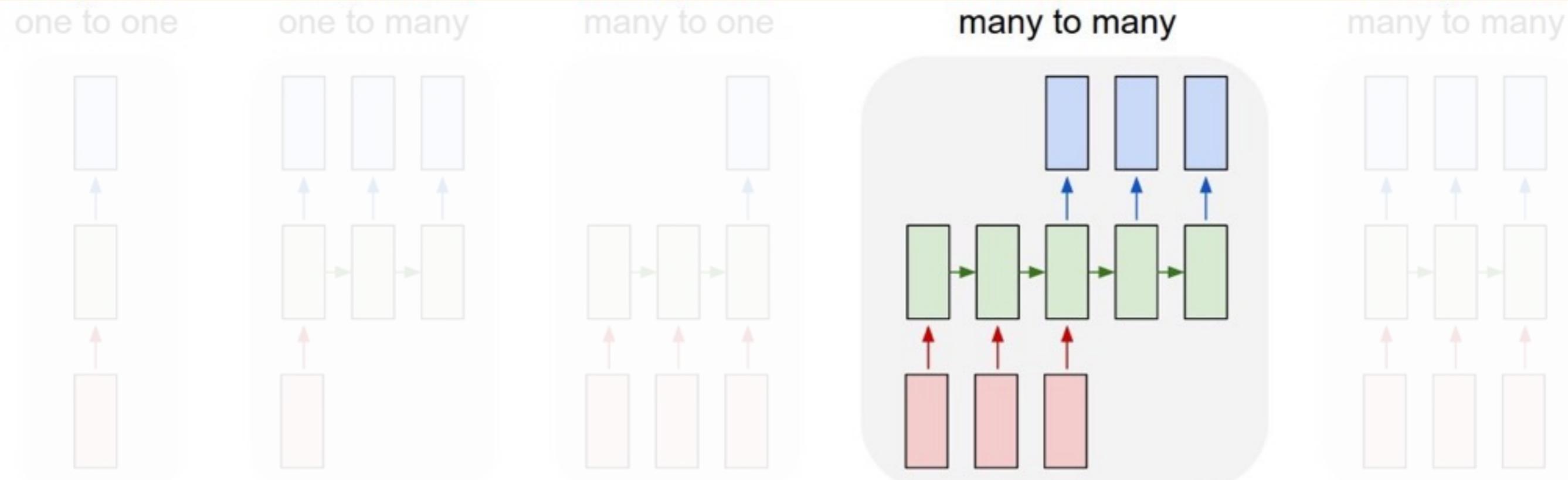
Google's Neural Machine Translation System



Wu et al. 2016

Johnson et al. 2016

グーグルの翻訳AIが「独自の言語」を生み出したといえる根拠 (WIRED 2016.11.24)



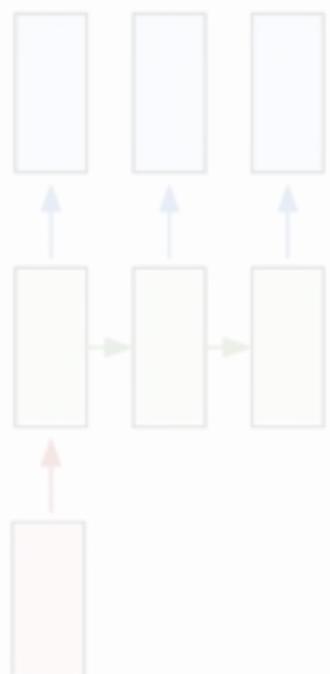
Four Experiments in Handwriting with a Neural Network



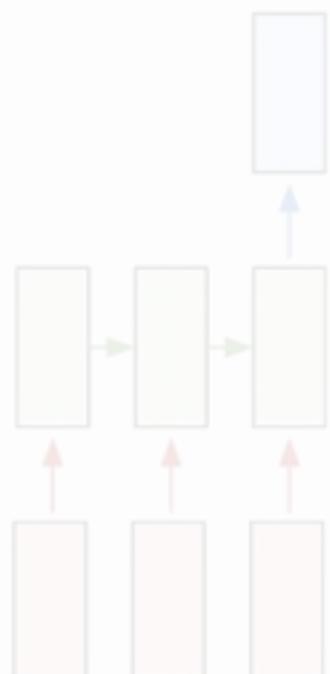
one to one



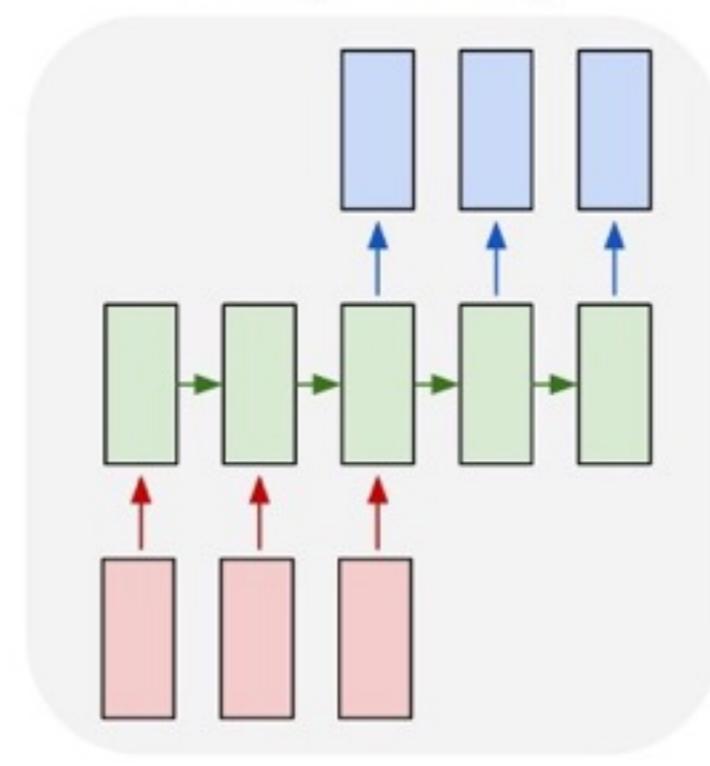
one to many



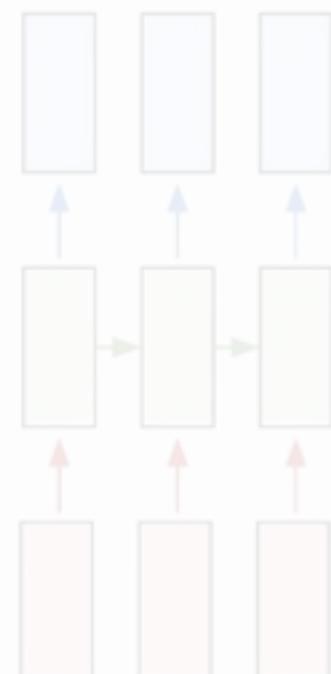
many to one

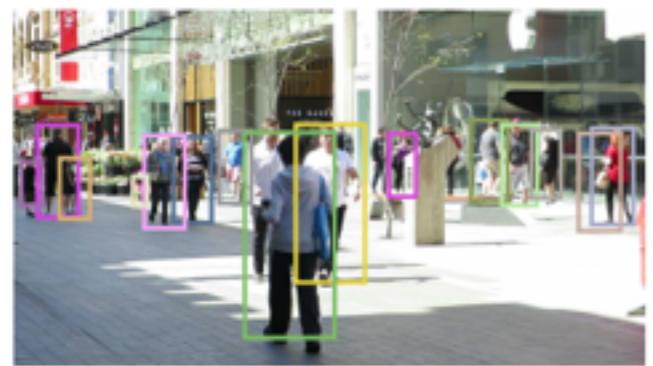


many to many

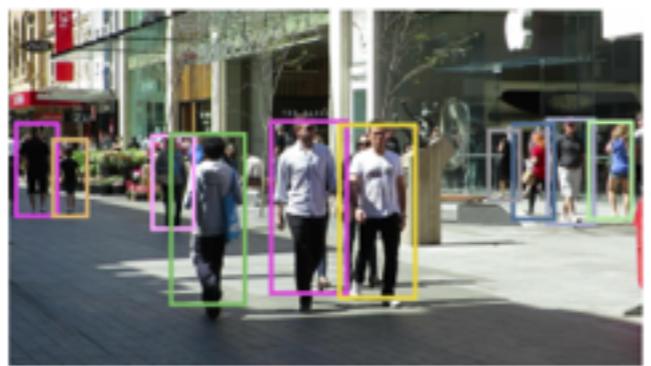


many to many





f104



f149



f203



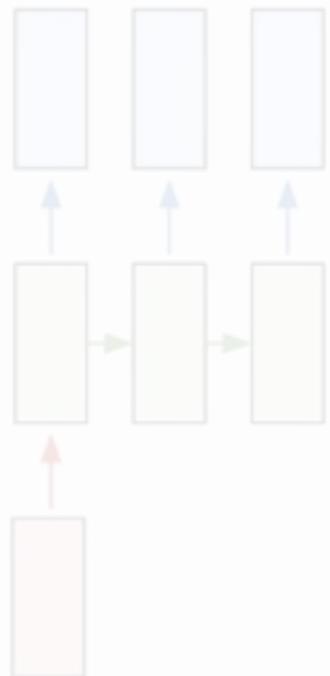
f235

Milan et al. 2016

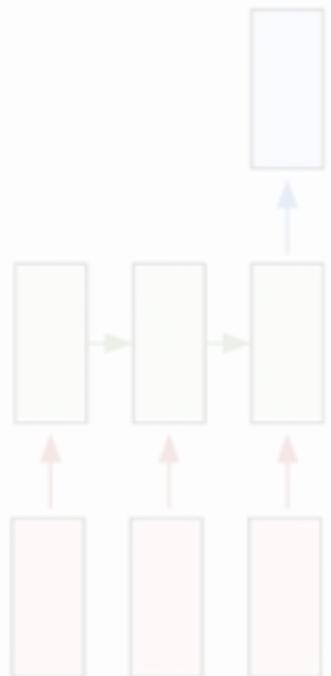
one to one



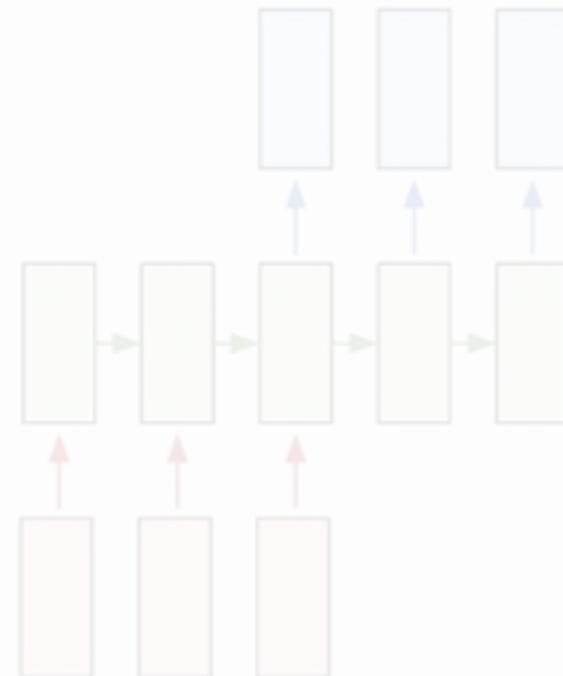
one to many



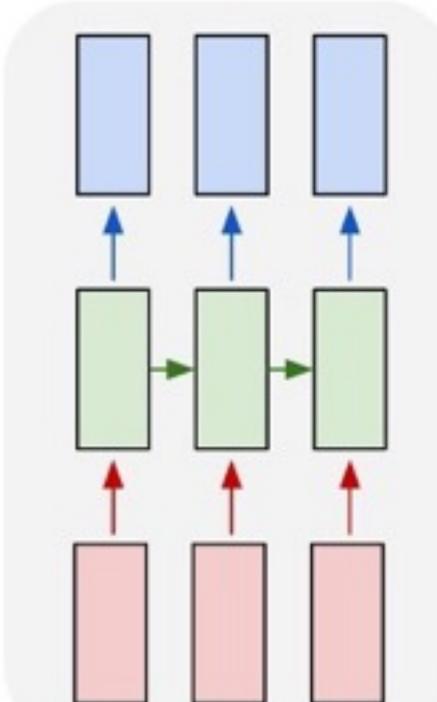
many to one

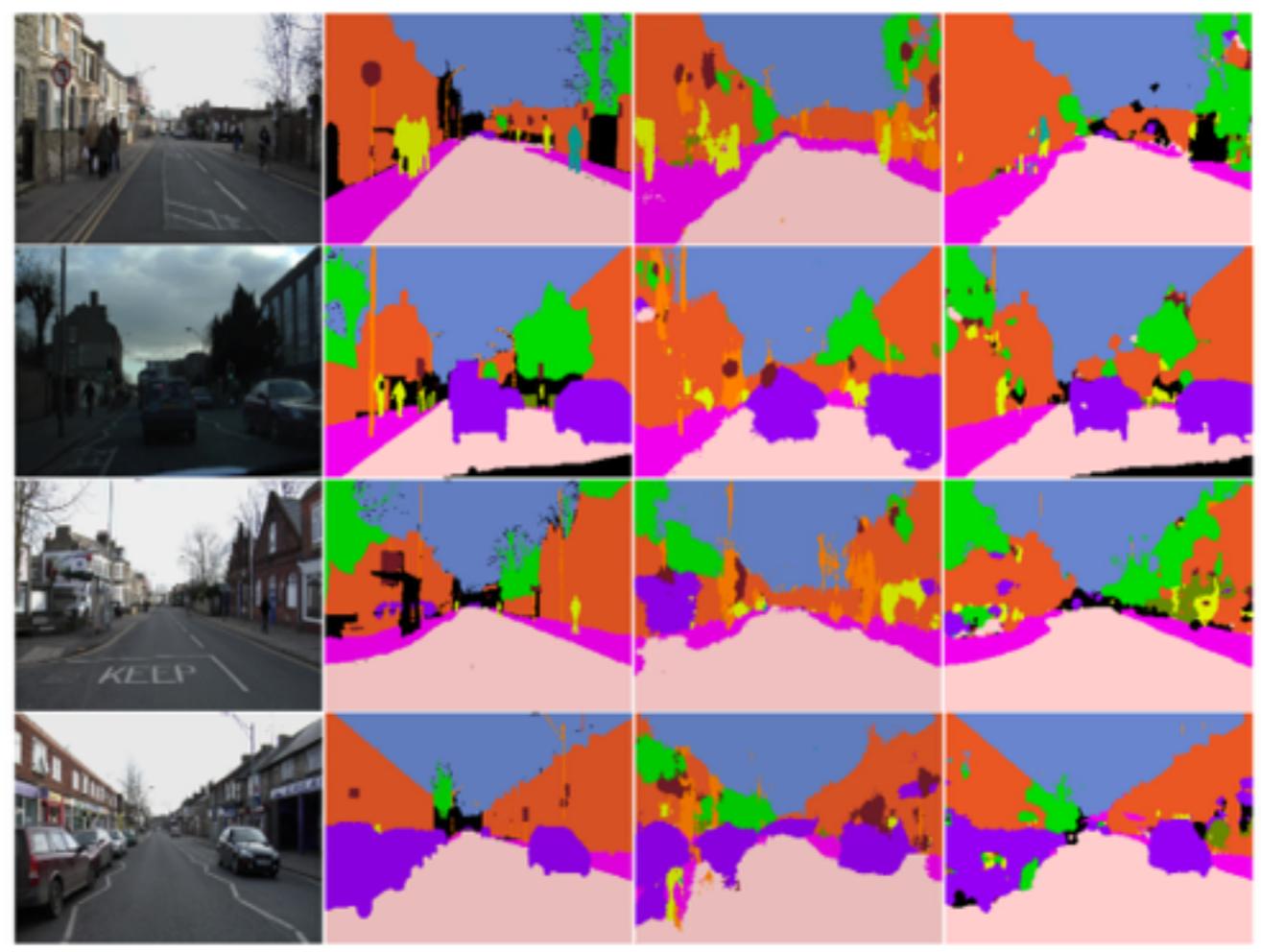


many to many



many to many





Patraucean et al. 2016

one to one



one to many



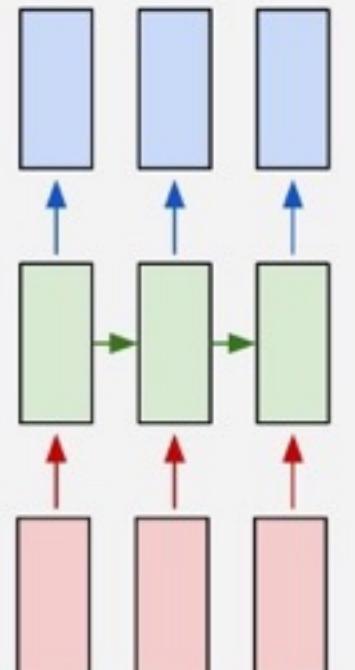
many to one



many to many

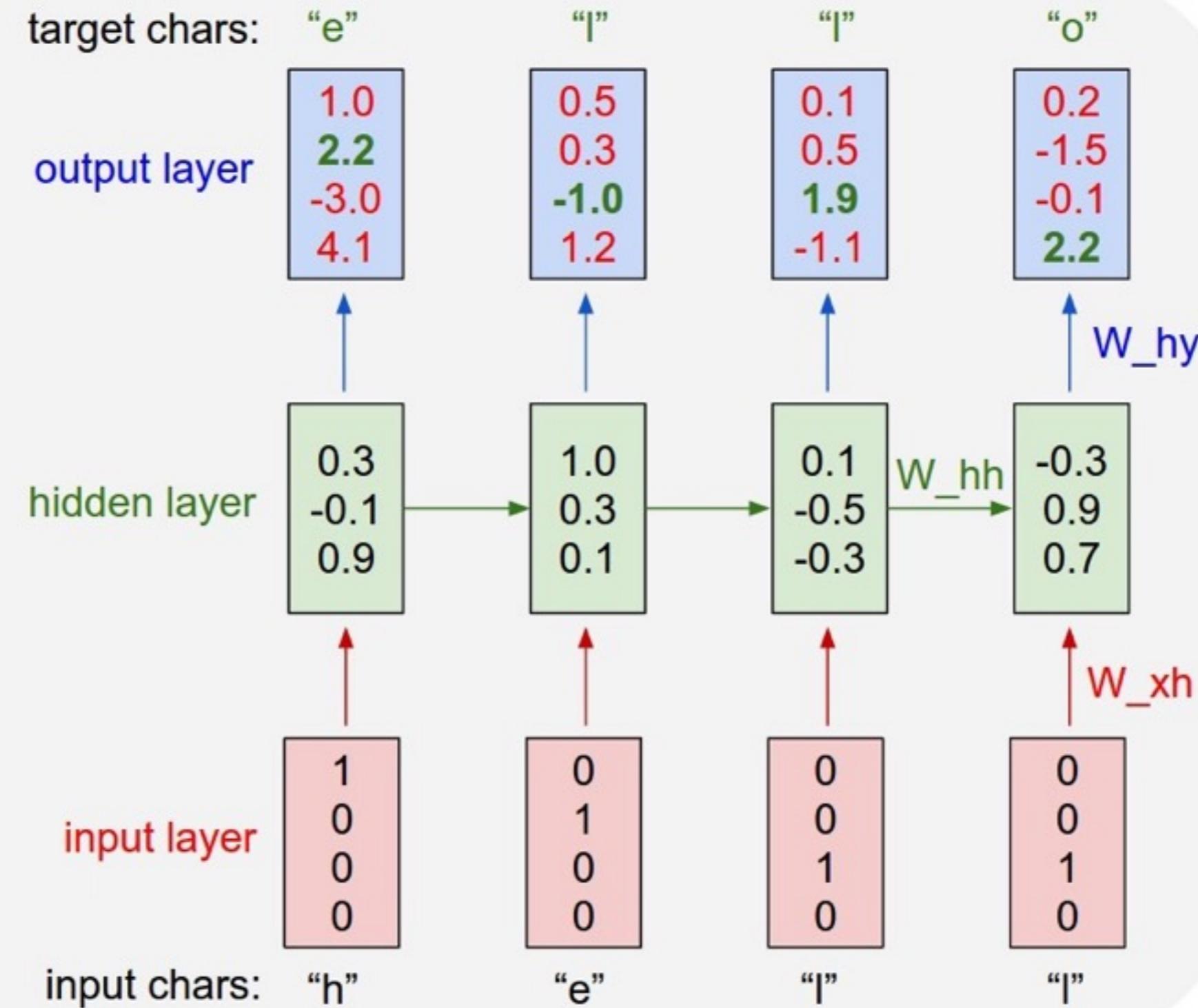


many to many



Network	Sky	Building	Pole	Road	Sidewalk	Vegetation	Traffic sign	Fence	Car	Pedestrian	Cyclist	Class Avg.	Global Avg.
SegNet	89.2	65.4	22.6	92.0	70.7	44.8	14.9	5.38	60.5	25.6	2.73	44.9	75.3
SegNet-flow	92.9	73.4	3.22	97.2	62.9	52.3	2.37	2.35	63.3	14.9	1.70	42.4	76.9

RNNのしくみ



Code! (Linux source code)

```
/*
 * Increment the size file of the new incorrect UI_FILTER group information
 * of the size generatively.
 */
static int indicate_policy(void)
{
    int error;
    if (fd == MARN_EPT) {
        /*
         * The kernel blank will coeld it to userspace.
         */
        if (ss->segment < mem_total)
            unblock_graph_and_set_blocked();
        else
            ret = 1;
        goto bail;
    }
    segaddr = in_SB(in.addr);
    selector = seg / 16;
    setup_works = true;
```

Shakespeare

PANDARUS:

Alas, I think he shall be come approached and the day
When little strain would be attain'd into being never fed,
And who is but a chain and subjects of his death,
I should not sleep.

Second Senator:

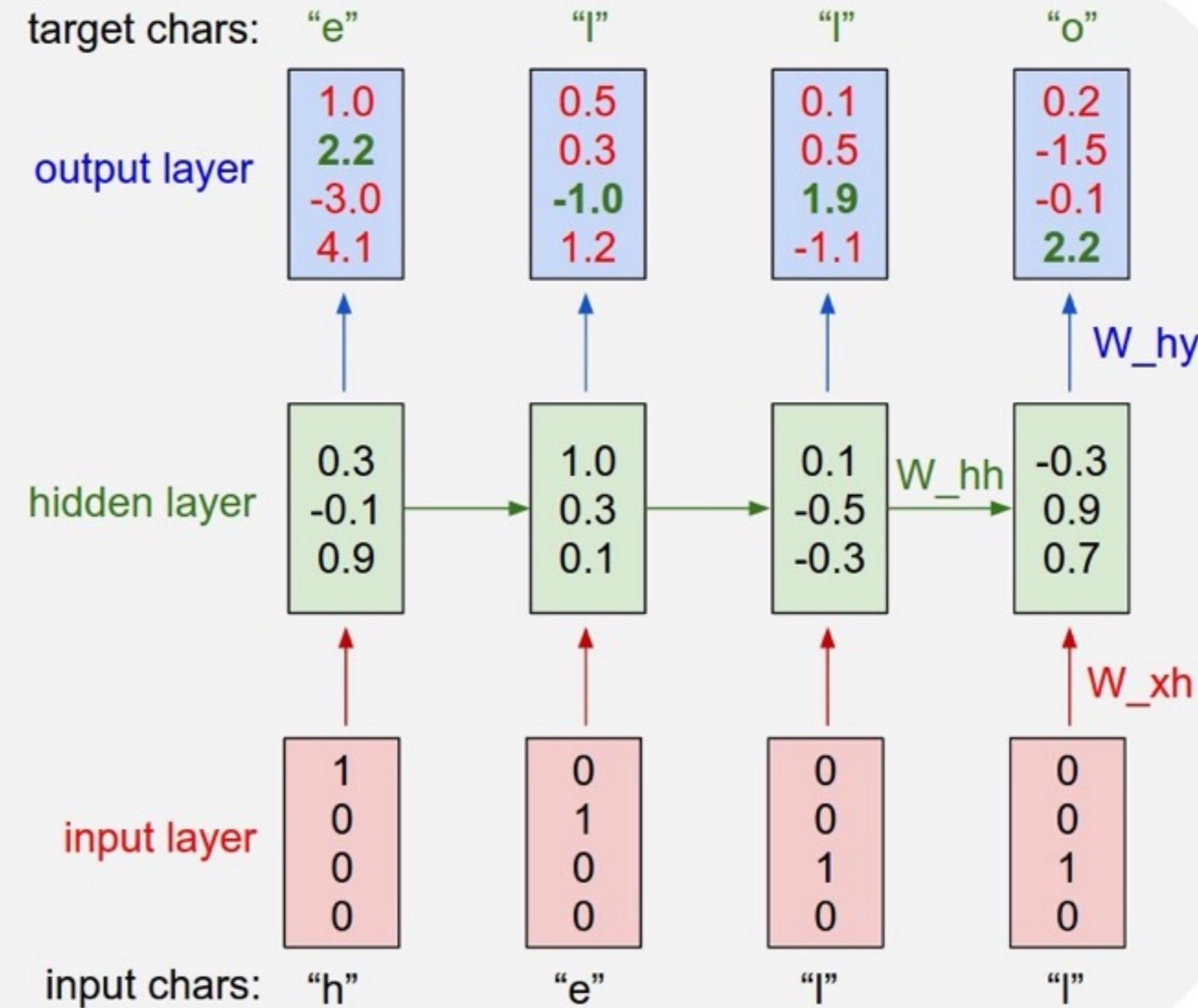
They are away this miseries, produced upon my soul,
Breaking and strongly should be buried, when I perish
The earth and thoughts of many states.

DUKE VINCENTIO:

Well, your wit is in the care of side and that.

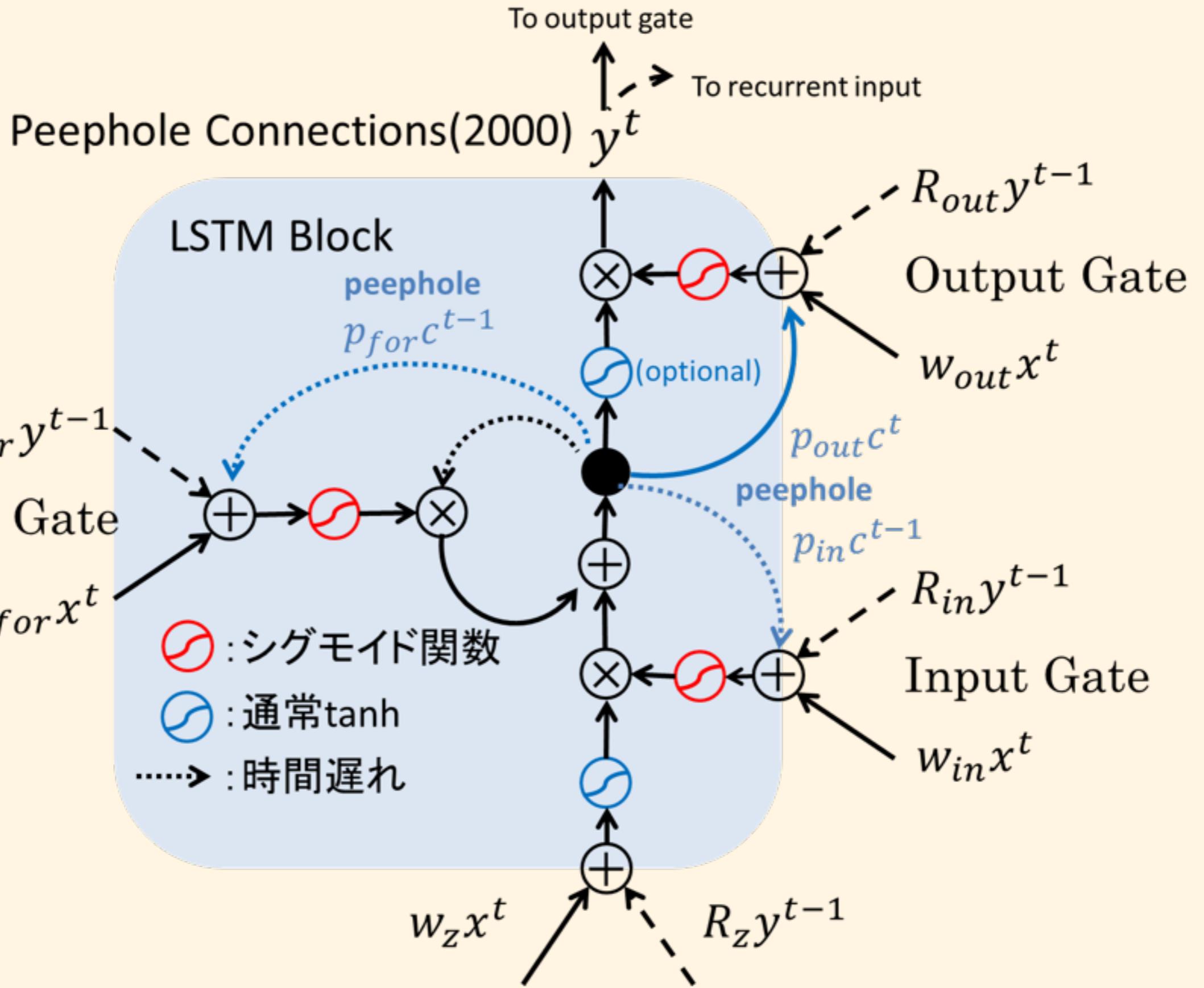
Naturalism and decision for the majority of Arab countries' capitalide was grounded by the Irish language by [[John Clair]], [[An Imperial Japanese Revolt]], associated with Guangzham's sovereignty. His generals were the powerful ruler of the Portugal in the [[Protestant Immineners]], which could be said to be directly in Cantonese Communication, which followed a ceremony and set inspired prison, training. The emperor travelled back to [[Antioch, Perth, October 25|21]] to note, the Kingdom of Costa Rica, unsuccessful fashioned the [[Thrales]], [[Cynth's Dajoard]], known in western [[Scotland]], near Italy to the conquest of India with the conflict.

RNNのしくみ



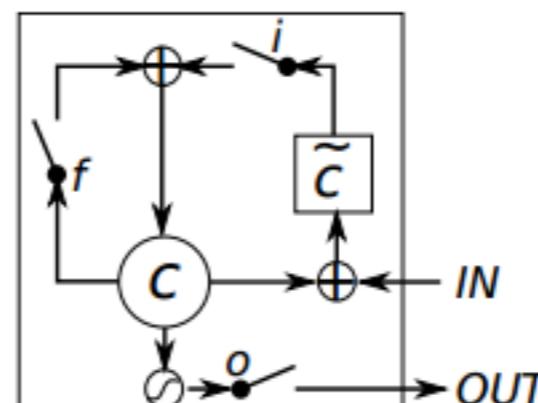
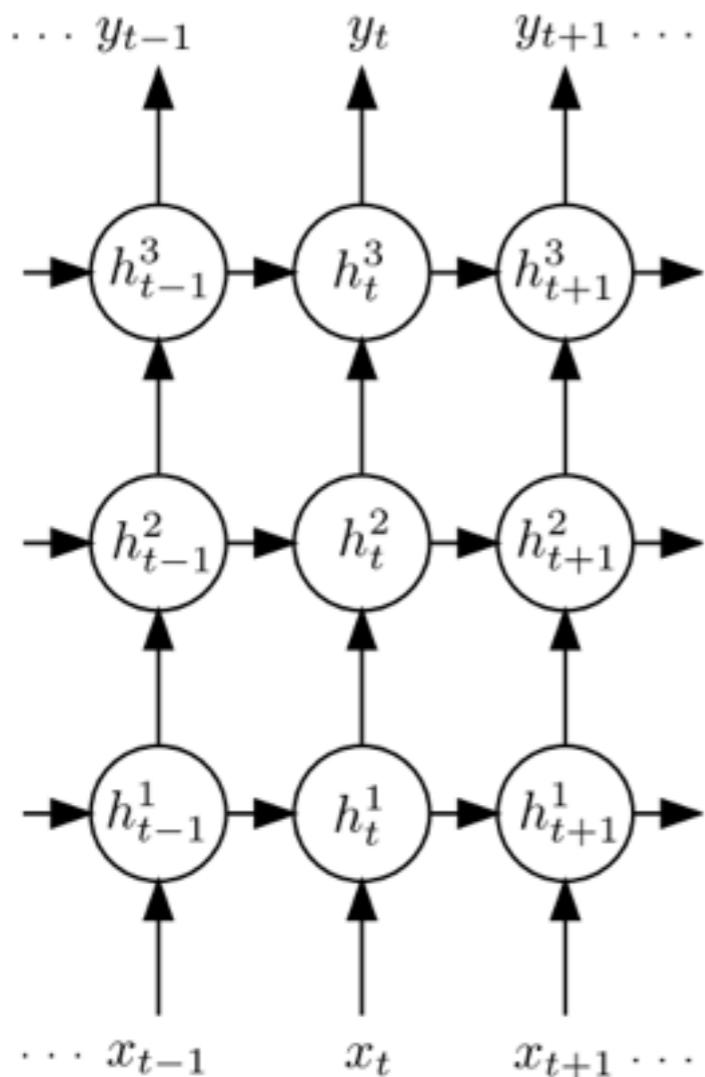
RNNセル

- SimpleRNN
- LSTM (Long-Short Term Memory)
 - わかるLSTM～最近の動向と共に
 - LSTMネットワークの概要
- GRU (Gated Recurrent Unit)

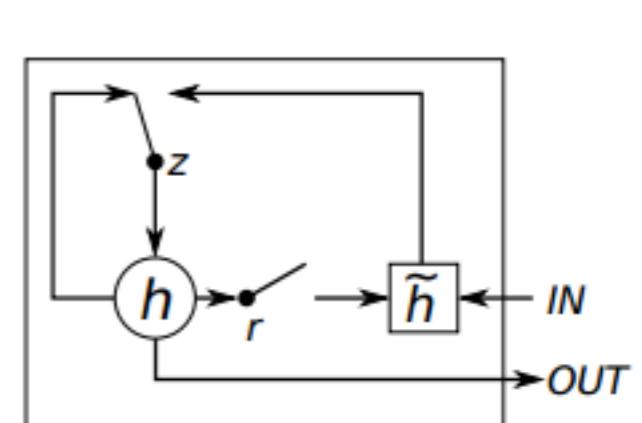


わかるLSTM ~ 最近の動向と共に

Deep LSTM/GRU



(a) Long Short-Term Memory



(b) Gated Recurrent Unit

Figure 1: Illustration of (a) LSTM and (b) gated recurrent units. (a) i , f and o are the input, forget and output gates, respectively. c and \tilde{c} denote the memory cell and the new memory cell content. (b) r and z are the reset and update gates, and h and \tilde{h} are the activation and the candidate activation.

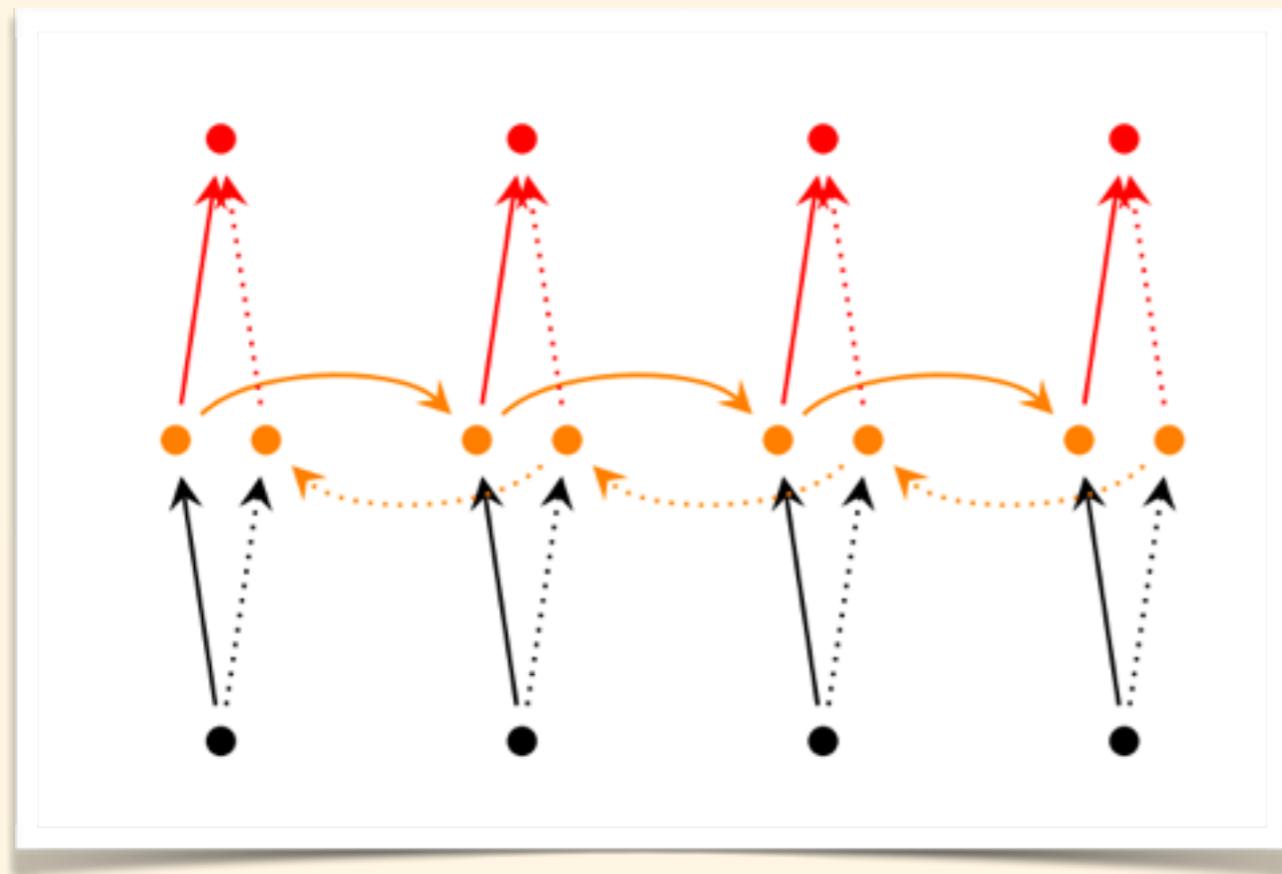
<http://deeplearning4j.org/lstm.html>

Fig. 3. Deep Recurrent Neural Network

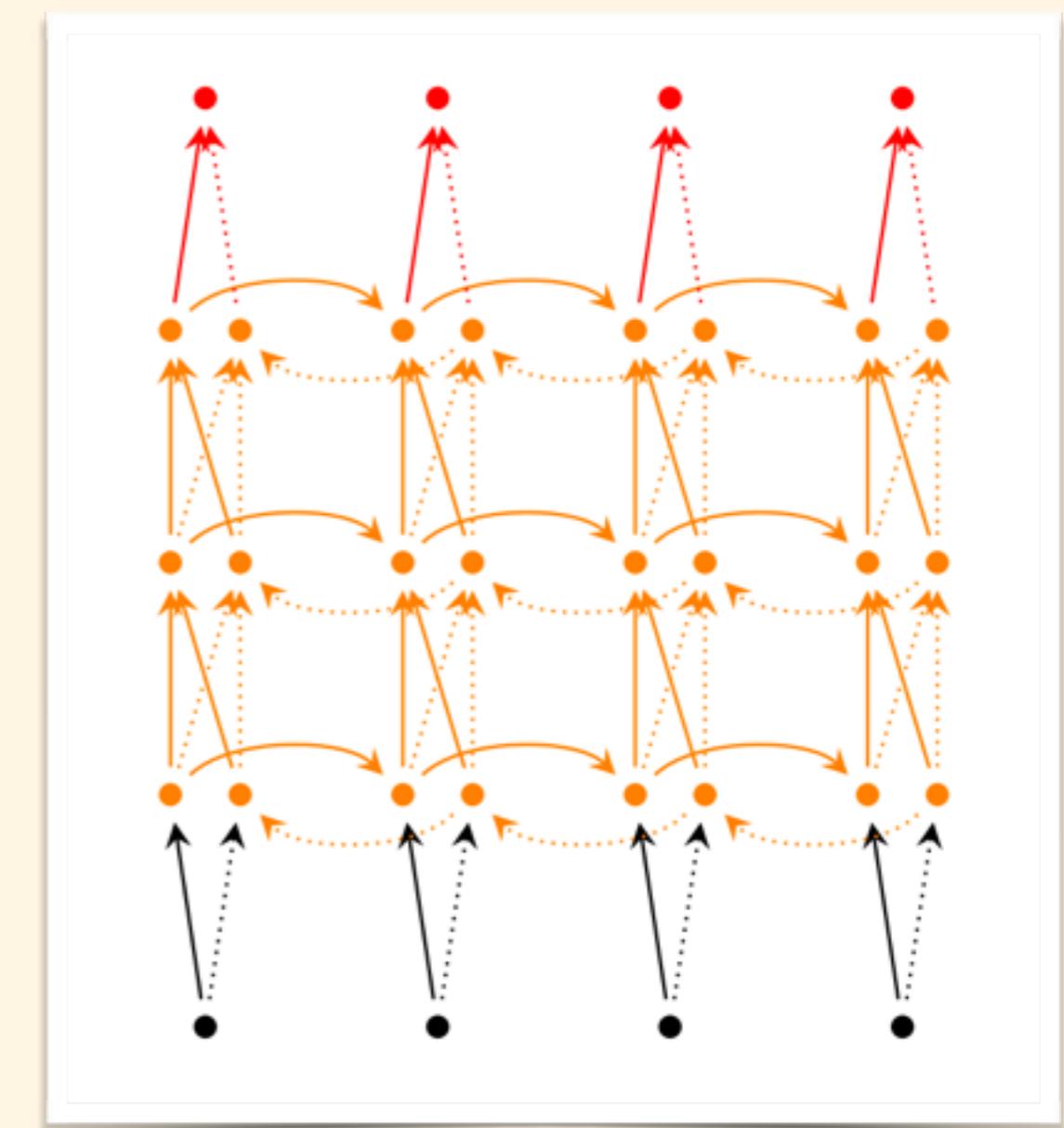
Graves et al., 2013

Bidirectional LSTM

- RNN Tutorial Part 1 (WILDM)
- pythonでBidirectional LSTMを使った分類問題(ゆるふわめも)



Bidirectional LSTM



Deep bidirectional LSTM



[DDBJデータ解析チャレンジ2016] DNA配列からのクロマチン特徴予測

*このコンペティションはDDBJ Data Analysis Challengeとして開催しております。

詳細は<http://www.ddbj.nig.ac.jp/ddbj-challenge2016-j.html>を御参照ください。

[DDBJ データ解析チャレンジ同意書](#)

DDBJでは、高速DNAシークエンサ由来のビッグデータDDBJ SRAを提供しています。このコンペティションでは、SRAを再解析したクロマチン特徴注釈データ（ChIP-Atlasデータベース）を用いて、入力DNA配列に対応するゲノム領域にクロマチン特徴領域が含まれるか否かを予測します。クロマチン特徴領域は遺伝子発現のオンオフ機能に関する領域であり、ChIP-Atlasデータベースでのピーク領域に相当します。ChIP-Atlasでは組織(CellTypeクラス)や機能種類(Antigenクラス)により条件が設定されています。課題データは8条件で構成されています。

問題の種類 分類

評価指標 平均ROC-AUC

状態 開催中

開始日時 2016/07/06 00:00 (Japan Standard Time)

終了日時 2016/08/31 23:59 (Japan Standard Time)

公開設定 公開（誰でもコンペティションの内容を閲覧できます）

参加者制限 制限なし（ユーザ登録済みであれば誰でもコンペティションに参加できます）



[DDBJデータ解析チャレンジ2016] DNA配列からのクロマチン特徴予測

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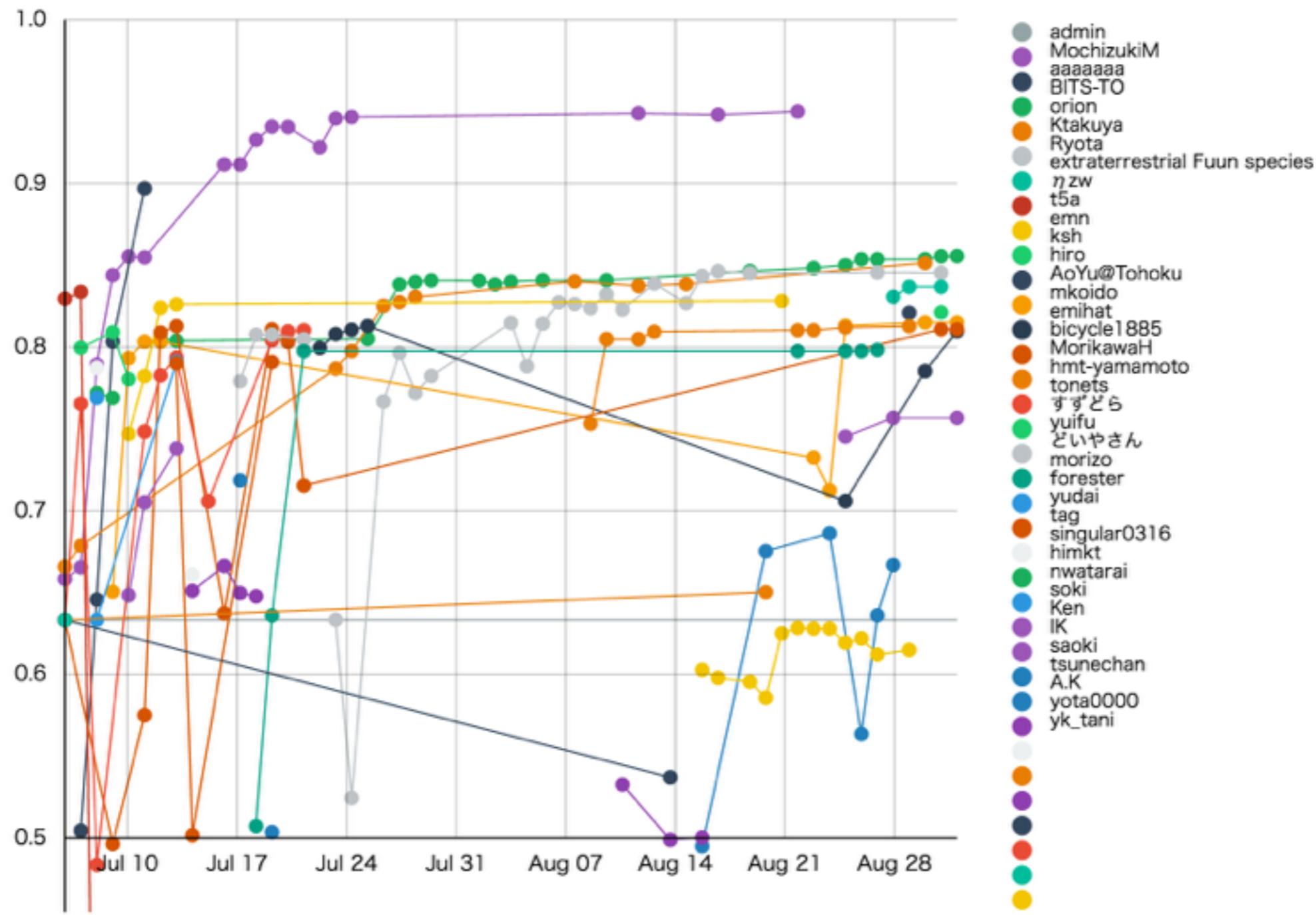
理解できる

理解できない…

- Q 遺伝研スパコンを必ず使う必要がありますか？
- A 遺伝研スパコンを使っても、使わなくてもどちらでも結構です。
- Q 遺伝研スパコンの利用申請時に、フリーランス(または会社員)なので責任者を記入できません。
- A フリーランスの方は経歴情報を、会社員の方はご所属の会社情報を、[遺伝研スパコンお問い合わせ窓口](#)までご連絡ください。
- Q Tutorialでは遺伝研スパコンのメモリ要求は24GBです。自分のプログラムではメモリエラーになりました。
- A TutorialはMATLAB線形判別分析用のメモリ設定になっています。
最大64GBまで設定可能 (-l mem_req=64G, -l s_vmem=64G) なので、プログラム毎に最適な値を指定してください。
64GBを超えた値を設定すると、core dump 出力でジョブは強制終了しますので御注意ください。

DDBJ Challenge (4/39)

スコアの推移（中間スコア）



では、やってみましょう