Creative Writing 101

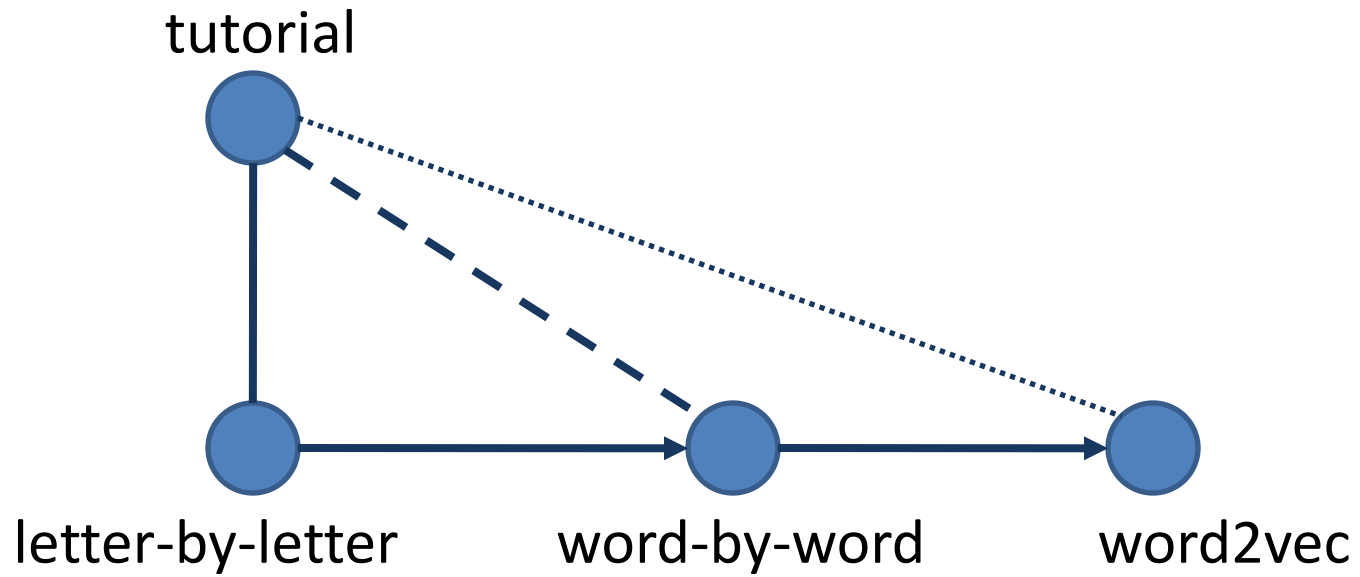## Machines Expressing their thoughts

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Intro

- Machine Learning – but how do they actually think?

- Creative text is reflecting the thinking patterns

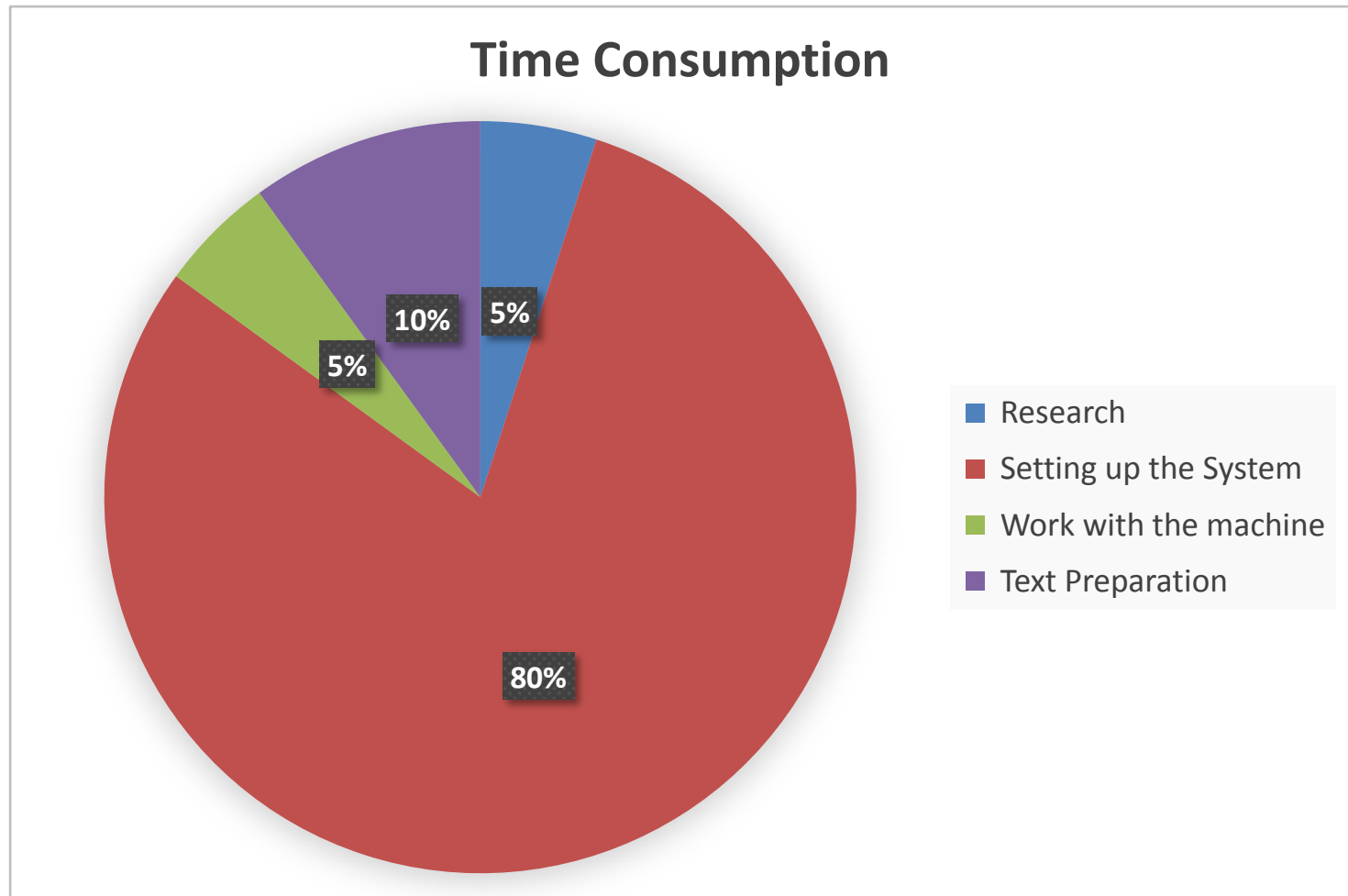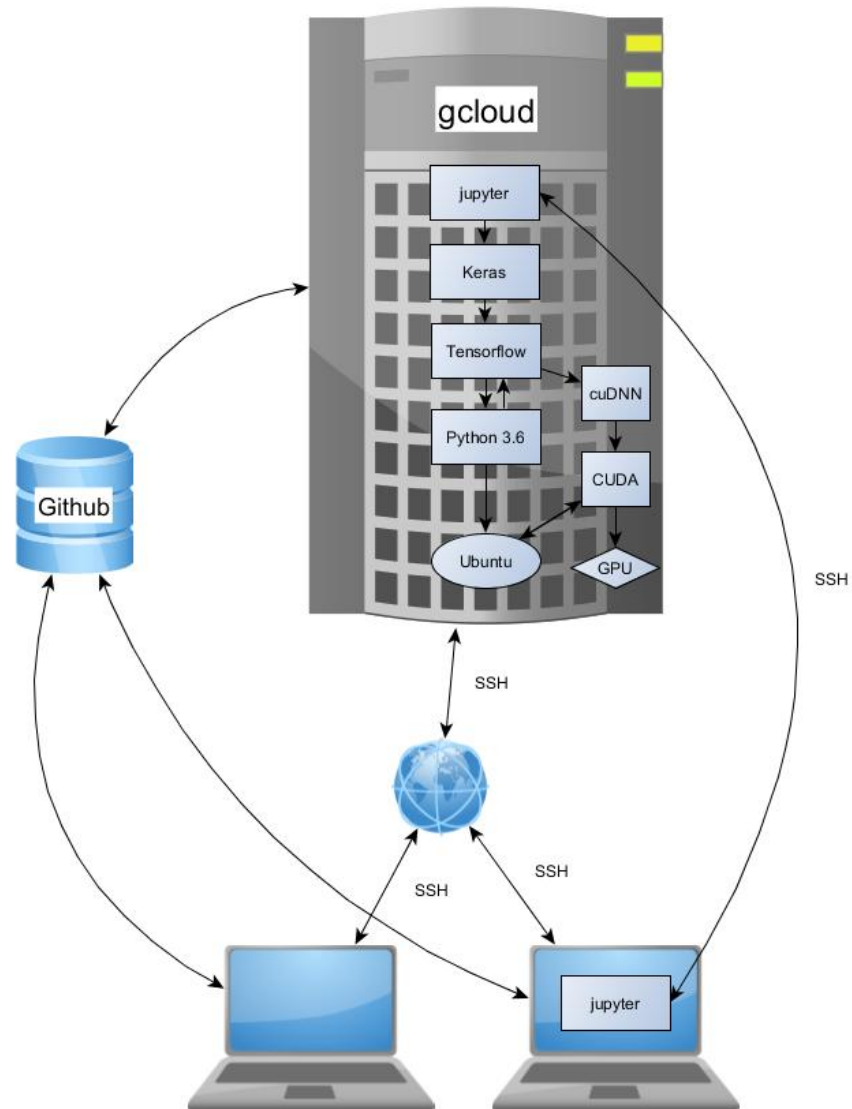- Personal main goal: Learning to implement Deep Learning

Plan

Sources

- L. Tolstoy: War and Peace – multi language

- Jeff Inlo: Delver Magic

- J.R.R. Tolkien: Lord of the Rings – big text body

- Shakespeare – difficult theater style

From Dream to Reality

Time Consumption

- 5% Research
- 80% Setting up the System
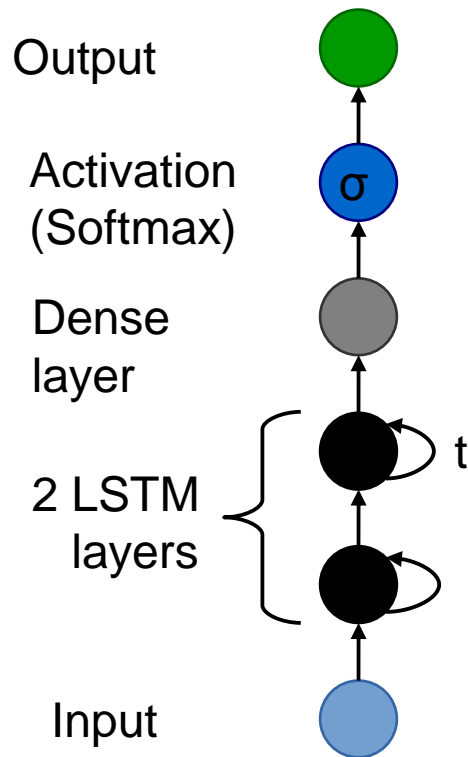- 5% Work with the machine
- 10% Text Preparation
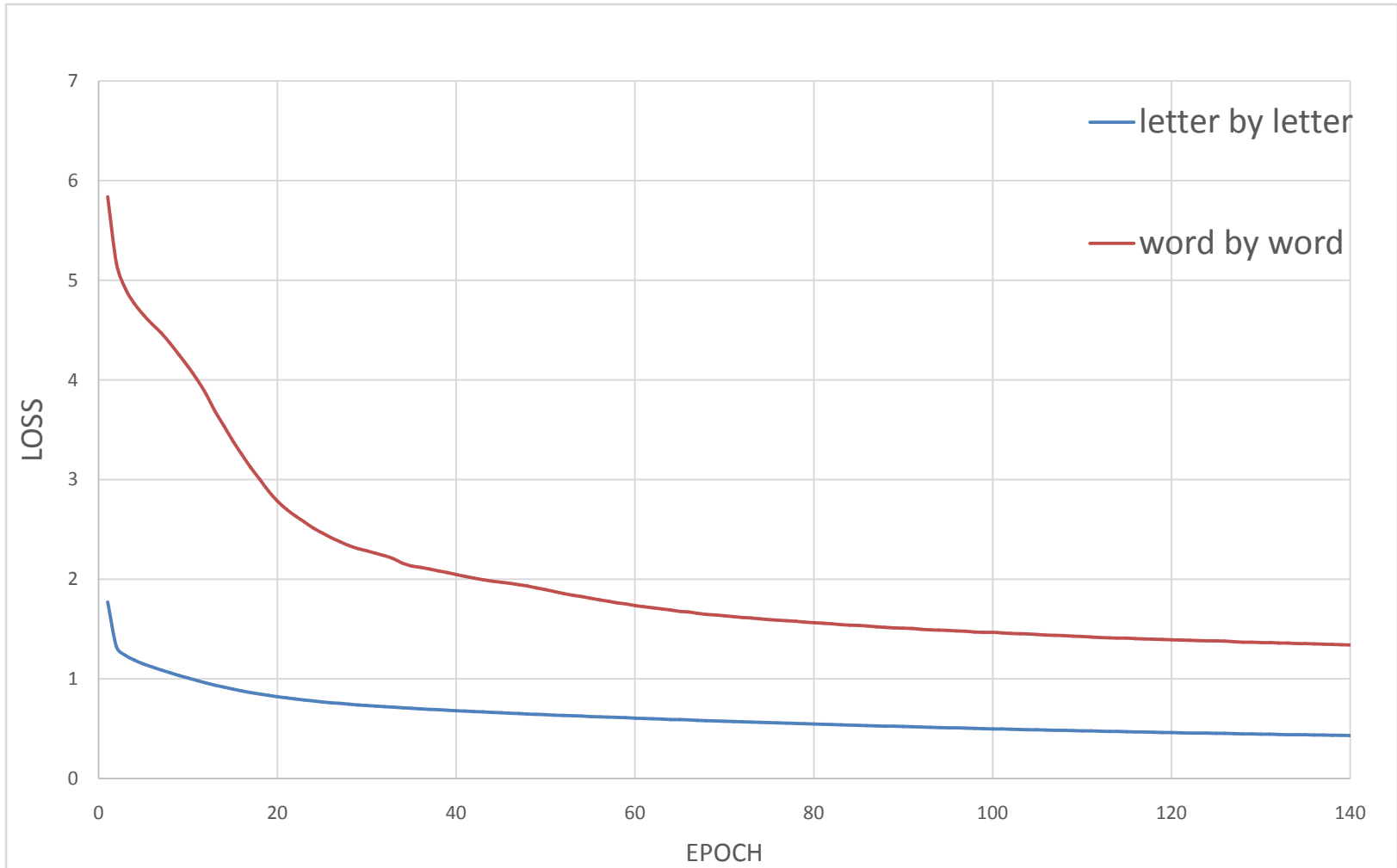
System Setup

Model

- Standards for Text Generation:
RNN, LSTM, GRU

- RNN has too short memory (vanishing Gradiant)

- Beginning with LSTM (tutorial)

- Next step: GRU

Model : Deep LSTM

Output

Activation
(Softmax)

Dense
layer

2 LSTM
layers

Input

- Dense Layer: Time
  Distributed
- LSTM: capacity=500

Results: Losses

Results: Sentences

Epoch 5:

Words: ..Grows ' of , unknown to , enemy the and and in am not know ' and unknown Frodo and unknown..

Letters: ..xing to the walls of the City, and the strangers were still the strangers and the strangers and the water and the walls of the East and the walls of the East..

Results: Sentences

Epoch 10:

<u>Words:</u> ..Gather the and and in will ' and unknown frodo the and in am sorry ' and unknown but have come a , way the and and in am sorry a the and of in they too rohan a..

<u>Letters:</u> ..? ' said Frodo. 'But I cannot see them and the strength of the house of Elendil and Isildur's Bane. I have not seen the next move. He wondered what he was of the words of the Shire and the sound of the stream that was still to be seen. The sun was shining in the sunlight of steel..

Results: Sentences

Epoch 40:

Words: ..Burst it stars to blue of green ' or after full are ever and and i ? The and and unknown we unknown unknown the , road we now ? Yet do but with would name ? ? ?..

Letters: ..Now Sam stirred. 'Well, well! may you leave him already.' He pained his eyes and struggled on the rim of the strange light of the mountain-side when the hearth will of the Entwash. The Shire was greater and stronger. For the moment more to the world..

Results: Sentences

Epoch 140:

Words: ..Backward , first unknown their shire the tell them ' was may be right south sod unknown our unknown gandalf gimli very gandalf..

Letters: ..'Yes, we'll go soon,' said Frodo, as he draided his long lists, all about the shadows of the grey trees, save for a fleeting man in Hobbiton and King Elendil are west of the Shire, and the rest may break out for them in the northern arcover..

Conclusion

- We could clearly see how the machines learn and understand the structure of language

- Encoding words as simple integers seems to stripe them from inner context

- Does maybe mo<u>ther</u>, fa<u>ther</u>, bro<u>ther</u> have inner structure the machine understands?

- Are children learning the same way?

Prospect/Perspective

- Using word2vec to keep word contexts
- Compare LSTM w/ GRU

Sources

- https://chunml.github.io/ChunML.github.io/project/Creating-Text-Generator-Using-Recurrent-Neural-Network : tutorial

- http://papers.nips.cc/paper/5166-training-and-analysing-deep-recurrent-neural-networks.pdf : DLSTM proposition(3layer)

- https://diplernin.github.io/ : Inspiration : DLSL group last year