



# Deep Learning for Language Analysis

## Deep Learning Introduction – Text Generation

**Research Goal**

**Retrieve Data**

**Prepare Data**

**Model Data**

**Text Generation with Neural Network**



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# **Research Goal**

Generate text by using a Machine Learning algorithm

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# Retrieve Data

## General

- > Model should accept any kind of text data
- > You can choose text from Shakespeare to Trump to  
Source code to anything you like
- > We provide a sample data set

# Retrieve Data

## Open Data Sites

- > <http://www.gutenberg.org/>
- > <http://qwone.com/~jason/20Newsgroups/>
- > <https://skymind.ai/wiki/open-datasets>
- > Or just Google what you want :)

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# Prepare Data

## Base model

- > We choose a Character based embedding in order to generate text
- > Each Character is a one-hot-encoded vector

### Example:

*Assume:* We have a 4 letters alphabet: „H“, „E“, „L“, „O“

*Goal:* Predict word „Hello“, e.g.

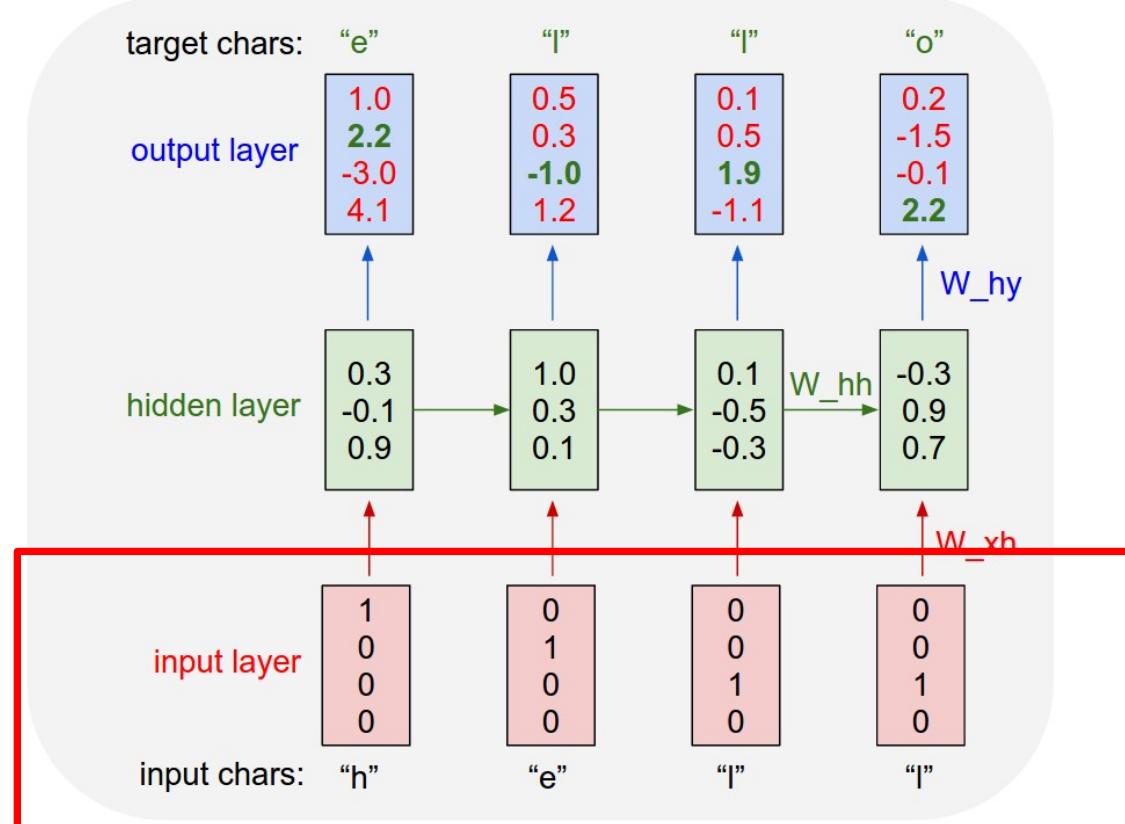
„H“ ⊕ „ello“

„He“ ⊕ „llo“

...

# Introduction

## One-Hot-Encoding



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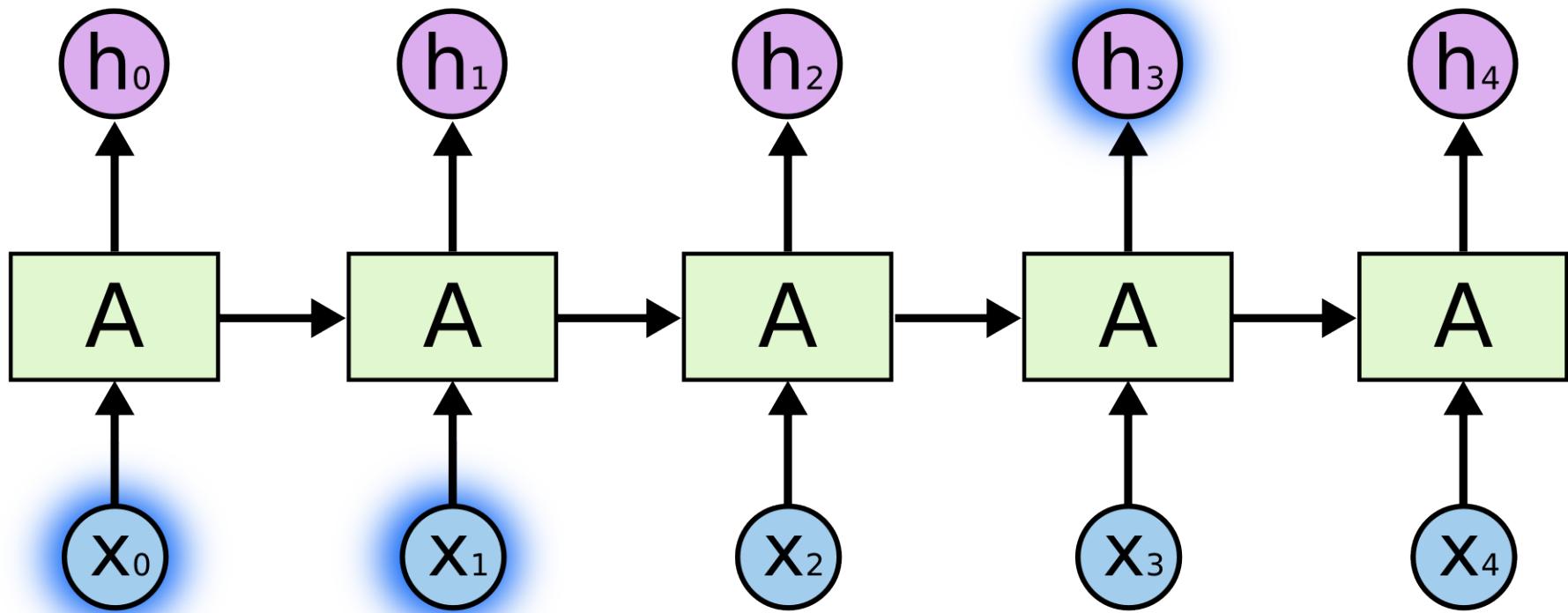


## Recurrent Neural Network

- > Recurrent Neural Network (RNN) as model
- > RNNs have a „memory“
- > Takes not only input into calculation for each neuron but also the result of previous neurons
- > Much more like the human brain (reading, speaking, etc.)

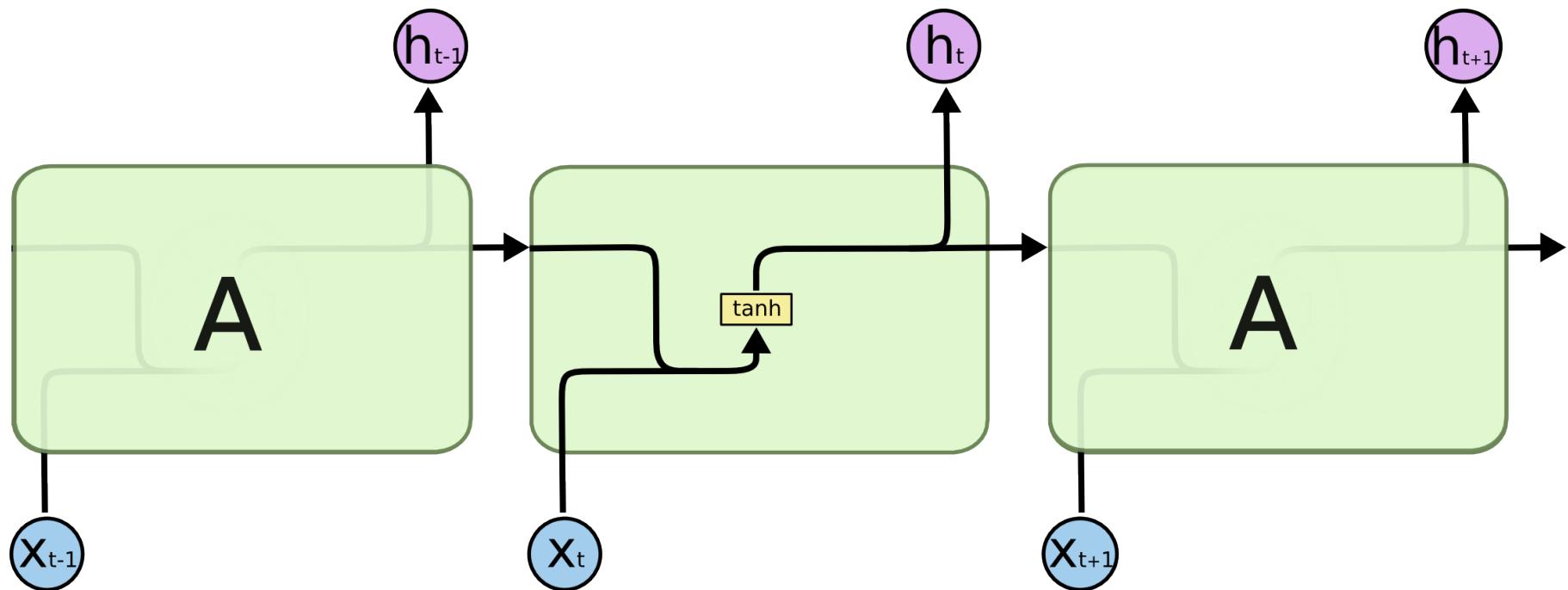
# Model Data

## Recurrent Neural Network – Remember previous



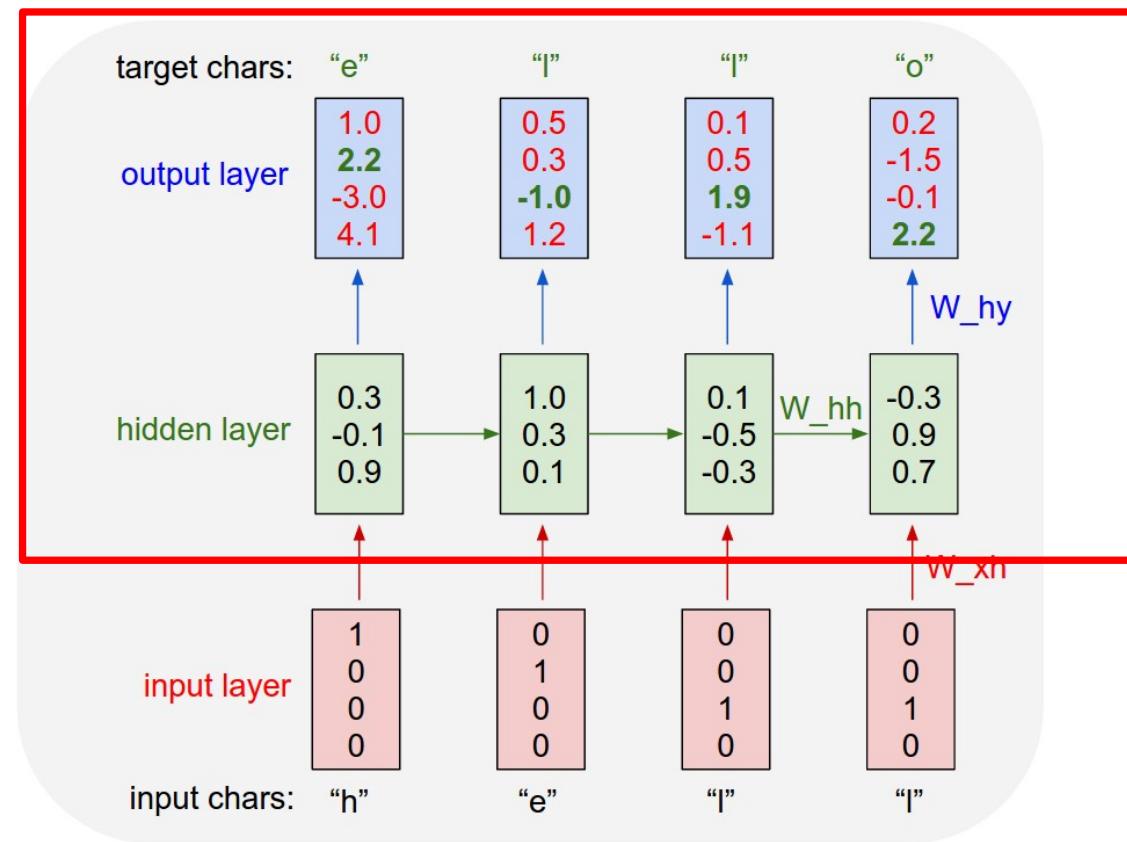
# Model Data

## Recurrent Neural Network – Internal Calculation



# Model Data

## Recurrent Neural Network – Example



**Research Goal**

**Retrieve Data**

**Prepare Data**

**Model Data**

**Summary**



# **Text Generation with Neural Network**

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**Let's get our hands dirty! – again**