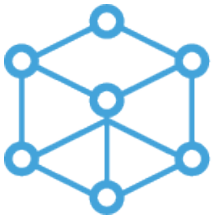


DATA BOT BOX | bitfusion

# ‘Build your Own AI-Driven Bot’ Workshop

# A Brief History

- Chatbots were developed from the artificial intelligence sub-discipline of Conversational Informatics first initiated in 1960s
  - Conversational informatics is the study of communication between:
    - Humans and other humans
    - Humans and intelligent agents (artificial intelligence-driven agents)
    - Intelligent agents (artificial intelligence-driven agents)
  - Key ‘forefathers’ of Conversational Informatics include:
    - Toyoaki Nishida, Atushi Nakazawa, Yoshimasa Ohmoto, Yasser Mohammad, many others
  - Modern conversational agents or Chatbots sometimes talk to humans or even to each other!

DATA BOT BOX



bitfusion

# Conversational Informatics as a Discipline

- Conversational informatics combines the study of:
  - Linguistics
  - Natural Language Processing
  - Machine Learning, Neural Networks
  - Cognitive Processes such as Intent
  - Speech Act Theory
  - Non-verbal communication
  - Implicit and explicit communication

DATA BOT BOX



bitfusion

# Goals of Conversation 

- Conversation is a tool both humans and artificial agents use to achieve specific goals including:
  - *Entertainment*: conversations and language can be considered like playing a 'game' with another person or group of people
  - *Social*: Building a joint story to share in a community
  - *Understanding*: Articulating tacit thoughts and examining other's tacit thoughts
  - *Sales and Marketing*: Facilitation of transactional relationships (buying, selling goods for example)
  - *Information gathering*: Survey, testing
- **The Turing Test:** Developed by Alan Turing in 1950, is a test of a machine's ability to exhibit intelligent behavior equivalent to, or indistinguishable from that of a human

DATA BOT BOX



bitfusion

# Common Elements of Conversation

- Asking
- Informing
- Asserting
- Proposing
- Summarizing
- Checking
- Building
- Including
- Excluding
- Self-promotion
- Supporting
- Disagreeing
- Avoiding
- Challenging
- Attacking
- Defending
- Blocking
- Building rapport

DATA BOT BOX



bitfusion

# An Overview of Conversational Agents

- Common Chatbot/Conversational Agents:
  - Intent-driven
  - Information Retrieval

- Types of Chatbot Dialog Generation –
  - Generative (the most challenging)
    - Conversation is generated de novo from single words or groups of words called ‘utterances’
  - Narrative (the most common)
    - A conversation tree is generated and a story board or ‘narrative’ is created
    - Design thinking is a helpful technique in creating this type of chatbot

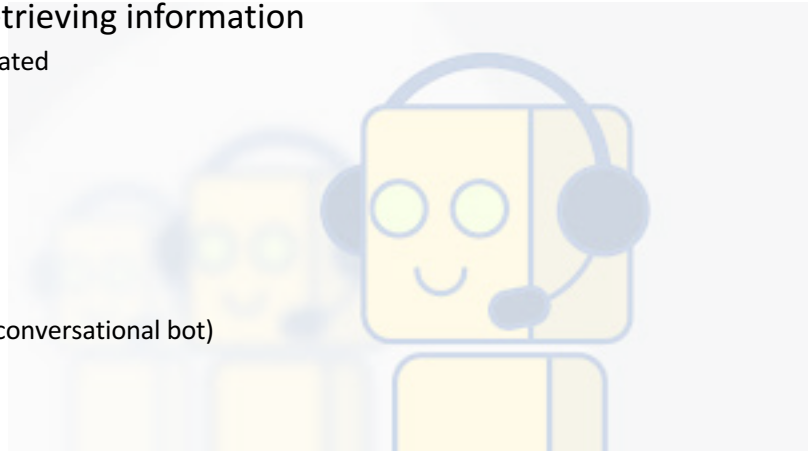
DATA BOT BOX



bitfusion

# Chatbot Conversation Tactics

- **Intent-Driven** – guiding a decision through understanding of customer's intent
  - Facebook messenger chatbots in which businesses can send targeted consumers promotional messages
- **Exploratory/Information Retrieval** – exploring a topic, retrieving information
  - Whole Foods Market chatbot for finding recipes with emoji incorporated
- **Debate** – arguing with zero sum
  - Heyday's chatbot using Donald Trump tweets
- **Discussion** – open conversation
  - Amazon Lex conversational interfaces (make your own open-ended conversational bot)
- **Deliberation** – joint decision making
  - X2AI AI chatbots for mental-health services
  - Narrative driven chatbots (more on this later)



DATA BOT BOX



bitfusion

# Intent-Driven Conversational Agents

- Companies can interact with shoppers in real-time
  - Answer questions shoppers have about a product
  - Steer shoppers to a particular product or suite of products
  - Suggest ‘add-on’ products
  - No attempt to pass the Turing Test as these chatbots are clearly utilitarian

DATA BOT BOX



bitfusion

# Information Retrieval Agents

- Examples:
  - Alexa, Siri, Google Home, Sirius (open source intelligent personal assistant)
  - Typically based upon knowledge graphs (more later)
  - Can easily retrieve information and answer complex questions
  - Do not display empathy well typically
  - Do not understand human emotion
  - Do not understand social cues
  - Does not pass the Turing Test

# Types of Dialog for Conversational Agents

- Generative Dialog
  - Common use case Seq-to-seq on Tensorflow uses a recurrent neural net consisting of stacks of ‘Long Short Term Memory’ architecture (LSTM cells), and an attention mechanism
  - Requires large quantities of ‘utterances’
    - Typical dataset would be Ubuntu Dialog Corpus ~ 1 million multi-turn dialogs
- Narrative dialog
  - Dialog narrative is generated by writers based upon conversation trees
  - Software to assist with this process is available, but generally anyone who is familiar with design thinking or movie script writing techniques can write a good narrative
  - Popular software to assist with narrative dialog generation includes:
    - Pullstring
    - BotSociety.io

DATA BOT BOX



bitfusion

# Generative Dialog

- Generative Dialog
  - Common use case Seq-to-seq on Tensorflow uses a recurrent neural net consisting of stacks of ‘Long Short Term Memory’ architecture (LSTM cells), and an attention mechanism
  - Requires large quantities of ‘utterances’
    - Typical dataset would be Ubuntu Dialog Corpus ~ 1 million multi-turn dialogs

DATA BOT BOX



bitfusion

# Challenges with Generative Dialog

- Large quantities of data are required to obtain a relatively good chatbot
- Chatbots will often exhibit poor grammar
- Even a well-trained chat bot will occasionally misinterpret the intent of the human in the conversation

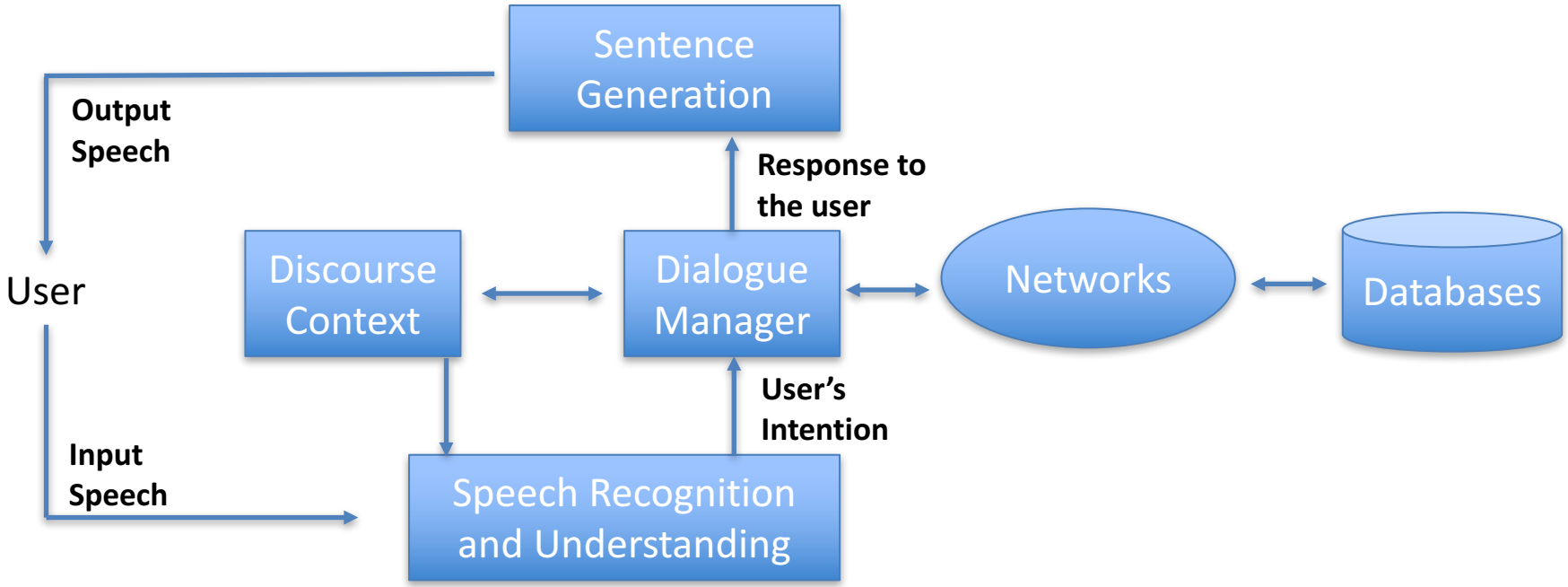
This intelligent agent does come closer to passing the Turing test as it can interpret on its own, the human's intent

DATA BOT BOX



bitfusion

# Architecture of a Generative Dialog Conversational Agent




DATA BOT BOX



bitfusion

# Narrative Dialog

- Narrative dialog
  - Dialog narrative is generated by writers based upon conversation trees
  - Software to assist with this process is available, but generally anyone who is familiar with design thinking or movie script writing techniques can write a good narrative
  - Popular software to assist with narrative dialog generation includes:
    - Pullstring
    - BotSociety.io

DATA BOT BOX



bitfusion

# Challenges with a Narrative Dialog

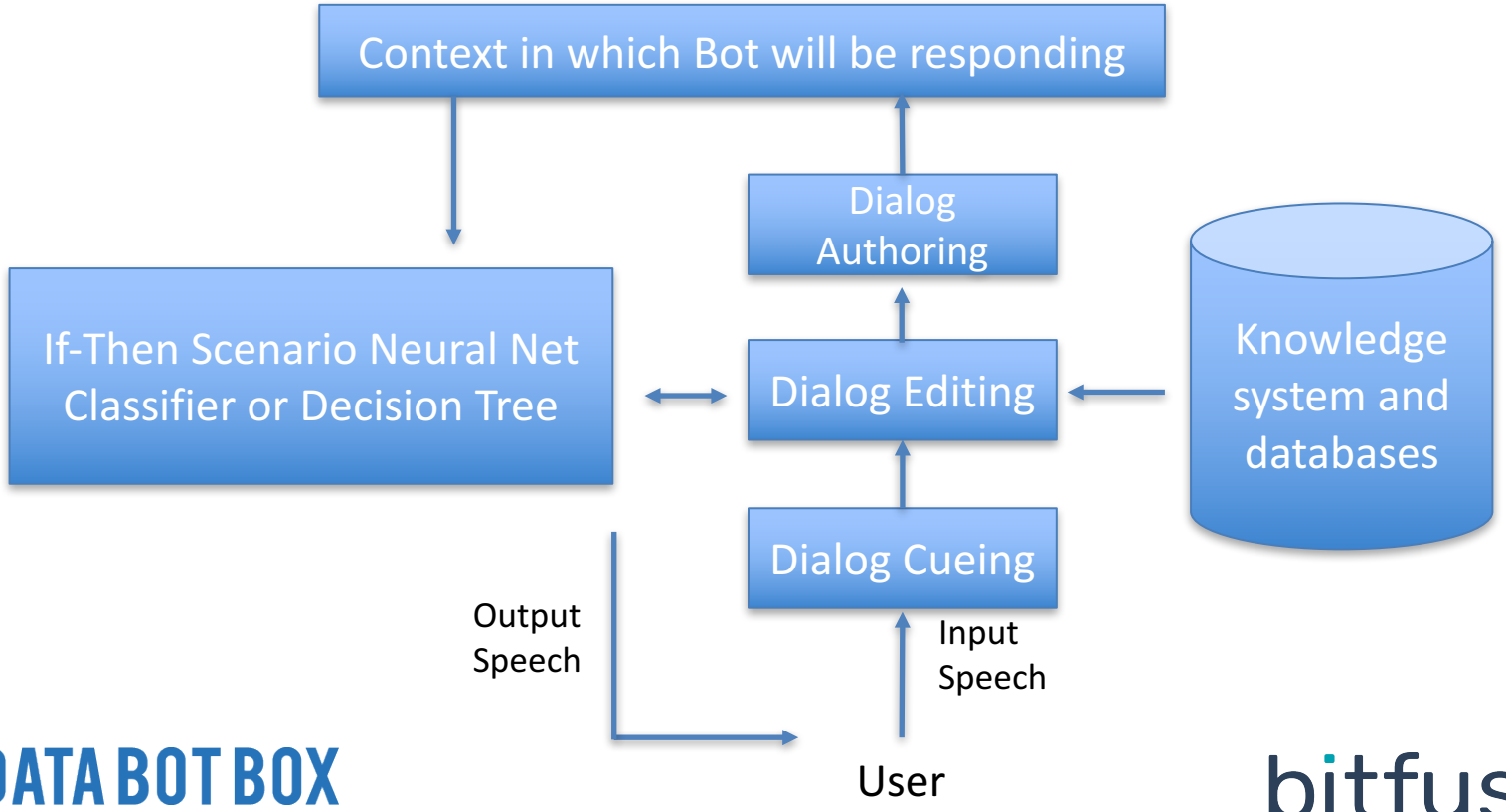
- Dialog can seem contrived
- Narrative is always semi-situated
- Not all situations will be covered by the narrative so many times the chatbot will not know how to respond to items that are ‘off script’

DATA BOT BOX



bitfusion

# Architecture of a Narrative Dialog Conversational Agent




DATA BOT BOX



bitfusion

Some Artificial Intelligence Advancements

# ADVANCED CONVERSATIONAL AGENTS

# Conversational Agents with Computer Vision

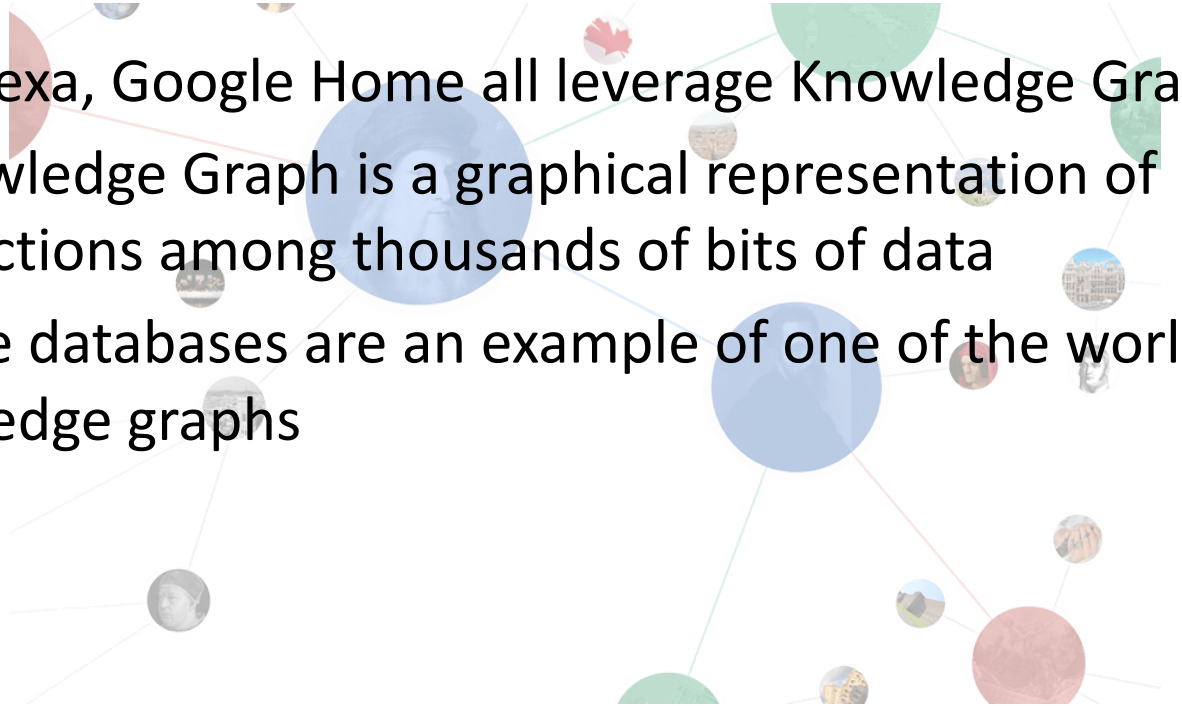
- Computer vision allows for facial recognition
- Computer vision allows for recognition of emotion
- Cameras are common on mobile phones, tablets and computers
- Most chatbots in the future will incorporate computer vision

DATA BOT BOX



bitfusion

# Conversational Agents Leveraging Knowledge Graphs



- Siri, Alexa, Google Home all leverage Knowledge Graph
- A Knowledge Graph is a graphical representation of connections among thousands of bits of data
- Google databases are an example of one of the world's largest knowledge graphs

# Conversational Agents Embedded within Robotics

- Most robots have Conversational Agents Embedded
- Some famous ones include Pepper but more advanced one such as Q.bo use complex AI for movement, speech and emotive qualities



DATA BOT BOX



bitfusion

# Emotionally Intelligent Conversational Agents

- Emotive Agents were first proposed by Justine Cassell
- The SARA project at Carnegie Mellon University Aims to integrate social intelligence into a Conversational Agent

- At Fjord, we built a multi-modal, emotionally intelligent bot for this year's SXSW.
  - https://www.engadget.com/2017/03/16/party-bot-decides-whos-on-the-guest-list/
  - https://digitaltrends.com/cool-tech/party-bot-ai-sxsw/#/2

DATA BOT BOX



bitfusion

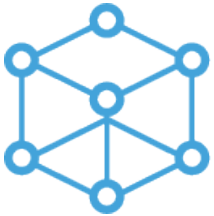
# Steps To Making Your Own Conversational Agent

- Determine overall goal of the conversational agent
- Determine conversational tatics to be employed
- Determine style of dialog
- Determine expected outcomes
- Determine deep learning and other appropriate algorithms
- Determine platform and DevOps requirements
- Determine data requirements

DATA BOT BOX



bitfusion



DATA BOT BOX | bitfusion

# WORKSHOP AND CODE

Jennifer Dawn Davis and Tim Gasper

# Styles of Seq-to-Seq Chatbots

## Google's Seq-to-seq Style

- Consists of series of Long term-Short-term Memory functions
- Does not need rules-based logic
- Uses Tensorflow library with Keras on the backend
- Remember Tensorflow does not place constraints on data input pattern
- Let's watch: https://youtu.be/SJDEOWLHYVo

## Facebook Innovation

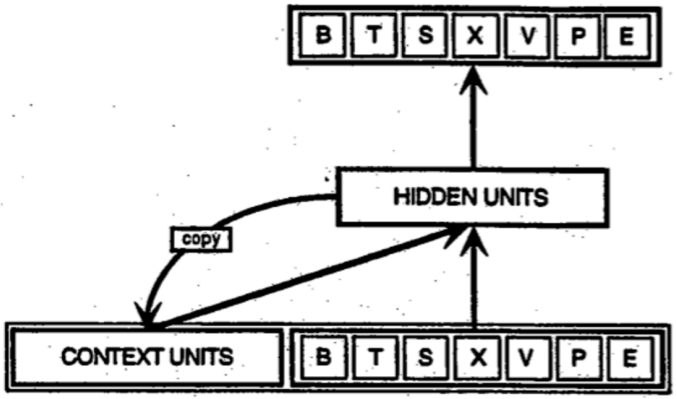
- Dynamic memory network
- Creates a question-and-answer question for large volumes of data for chatbots
- Does not need rules-based logic
- Consists of series of stacked LSTM with an activity function linking them
- Remember neither Keras or Tensorflow place constraints on data input patterns
- Uses Keras
- Let's watch: https://youtu.be/t5qgjJIBy9g

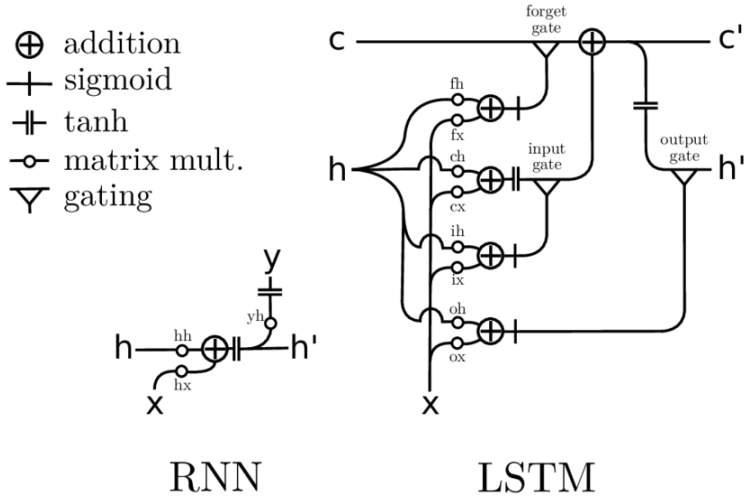
DATA BOT BOX



bitfusion

# Neural Nets & LSTM



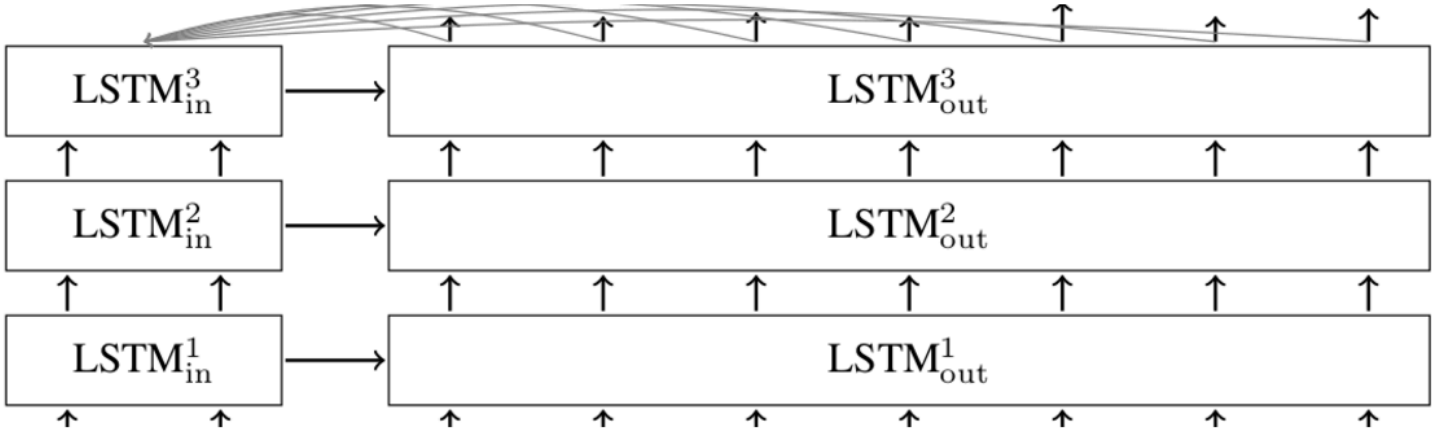

https://deeplearning4j.org/lstm
Advances in Humanoid Control & Percentpion, Stollenga, May 2016

DATA BOT BOX



bitfusion

# Seq-2-Seq LSTM Model from Tensorflow




https://www.tensorflow.org/tutorials/seq2seq

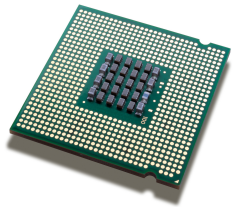
DATA BOT BOX



bitfusion

# CPU vs. GPU and Why it Matters

- Chatbots that run on artificial intelligence require machine learning, deep learning or neural nets that run on LOTS of complex data (TBs at minimum)
- Training can take years if not done is a concurrent fashion
- GPUs will allow for a high level of concurrency
  - Highly parallel structure allows processing of large blocks of data concurrently (1000s of cores)
  - Graphical Processing Unit (GPU) Chip was first popularized by Nvidia in 1999 for Gamers
- CPU (central processing unit) efficiently interprets and executes most of the commands from the computer's other hardware and software (best is 8-16 cores, 16-32 threads)



DATA BOT BOX



bitfusion

# Services to Run Training for AI-Driven Chatbots

- Bitfusion: works out of the box, most AI software programs are pre-loaded
- Pipeline.io: needs to be set-up in a hadoop-like fashion, but will contain most AI software programs
- Google Cloud GPU: Very expensive and you are charged by the minute.  Does not have many of the AI software uploaded
- IBM GPU Cloud: Charged by API Call
- Custom Centers (Typically have NVDIA Tesla GPU) in CUDA environment

DATA BOT BOX



bitfusion

# Examples: A practical understanding of Seq2Seq

- ***Setting up your virtual environment and Tensorflow***
  - In this class our bots will actually talk to themselves  in future classes we can create bots that talk to humans
- ***Example I:*** This example is taken from TensorFlow website
  - We run the code step-by-step although on a regular laptop it will take several hours to run
  - At the end we show and idea of a fun way you can change this code to make a party game where you feed the bot a movie line and responds with another movie line!
  - Possibilities are endless, just use your imagination
- ***Example II*** we will demonstrate a chatbot that is made using twitter data and Seq2Seq, created by Suryadeepan Ram
  - Try changing the data source to Reddit's famous 'Shower Thoughts' for a fun an quirky bot.  Stay tuned for our Github repository for an example of Ram's modified code using Reddit comments!
- ***Example III*** using the Bitfusion platform to train your Reddit bot!

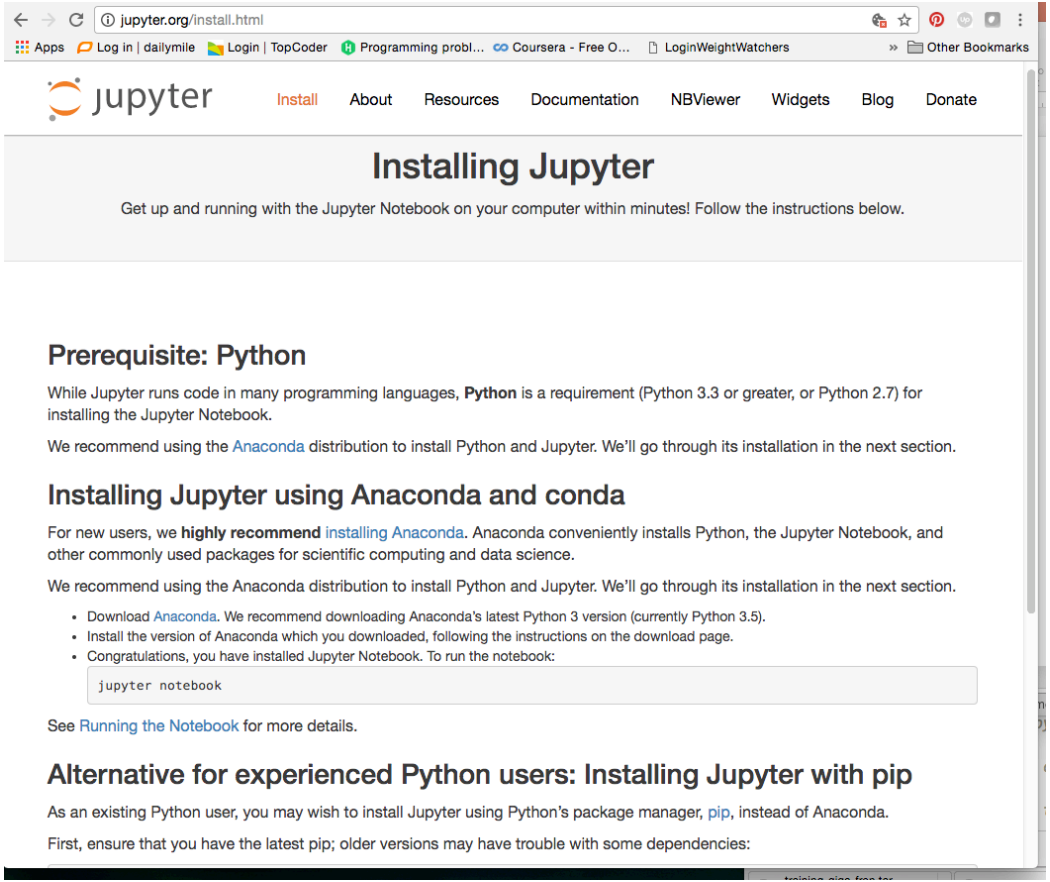
DATA BOT BOX

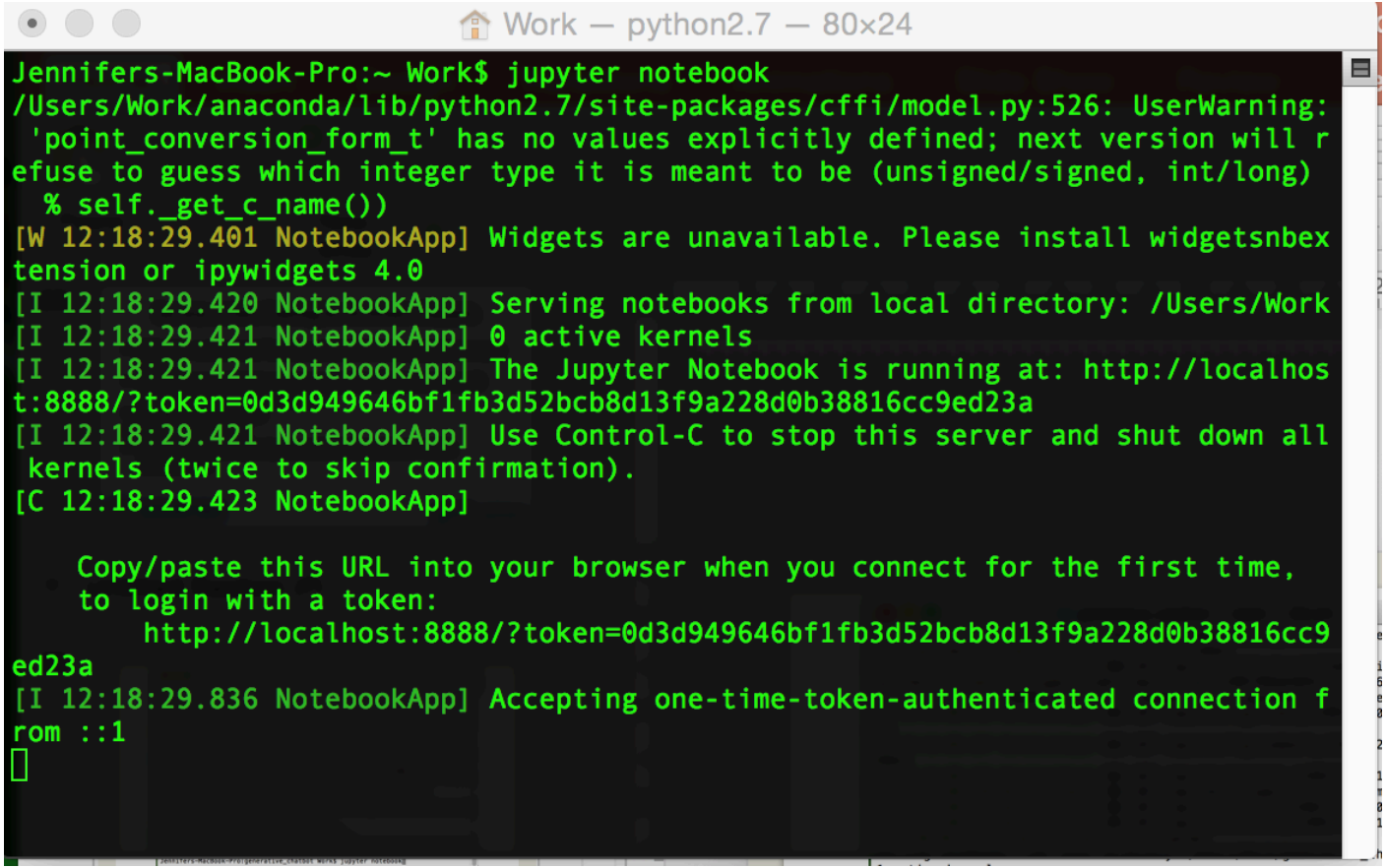


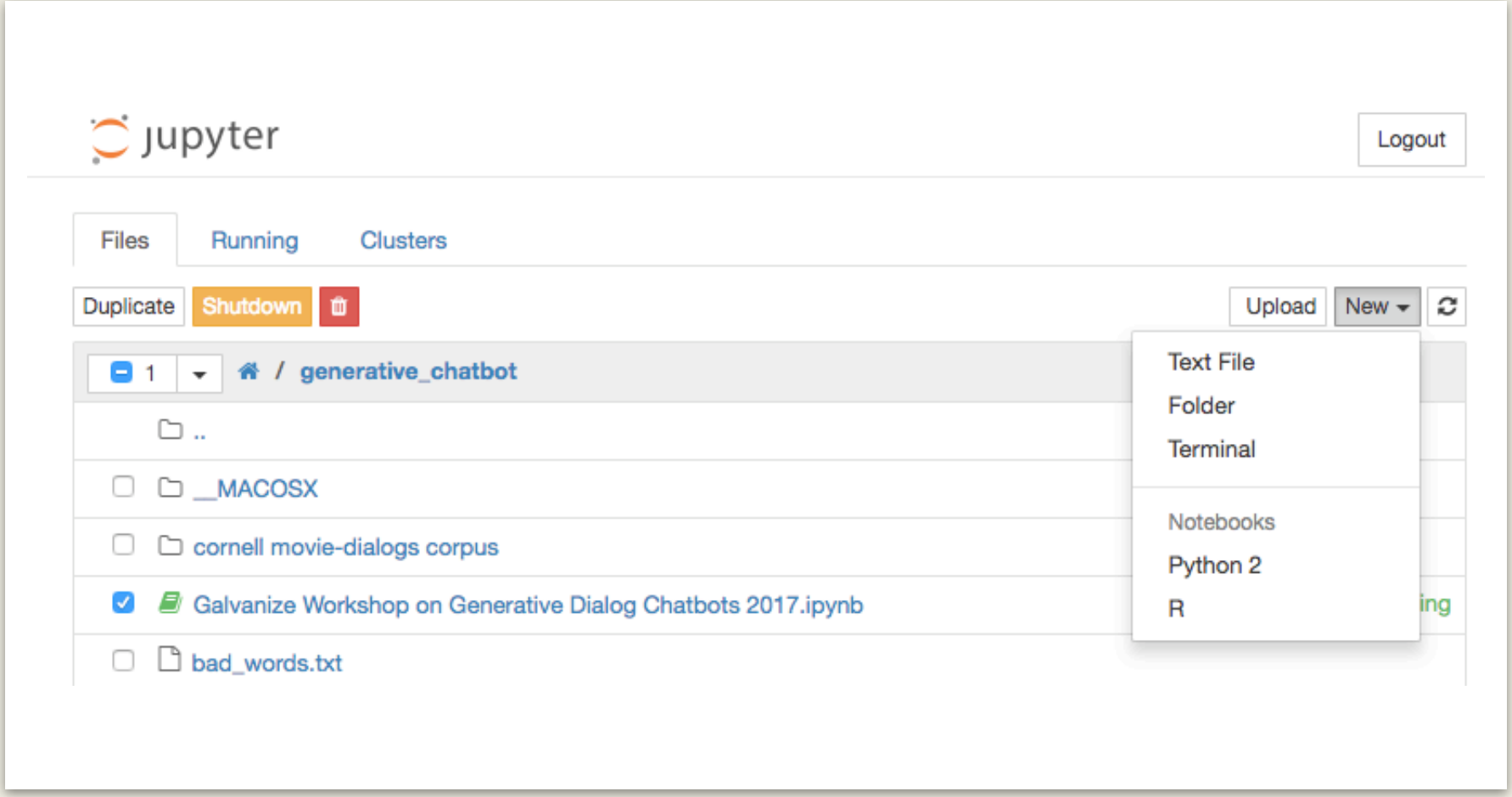
bitfusion

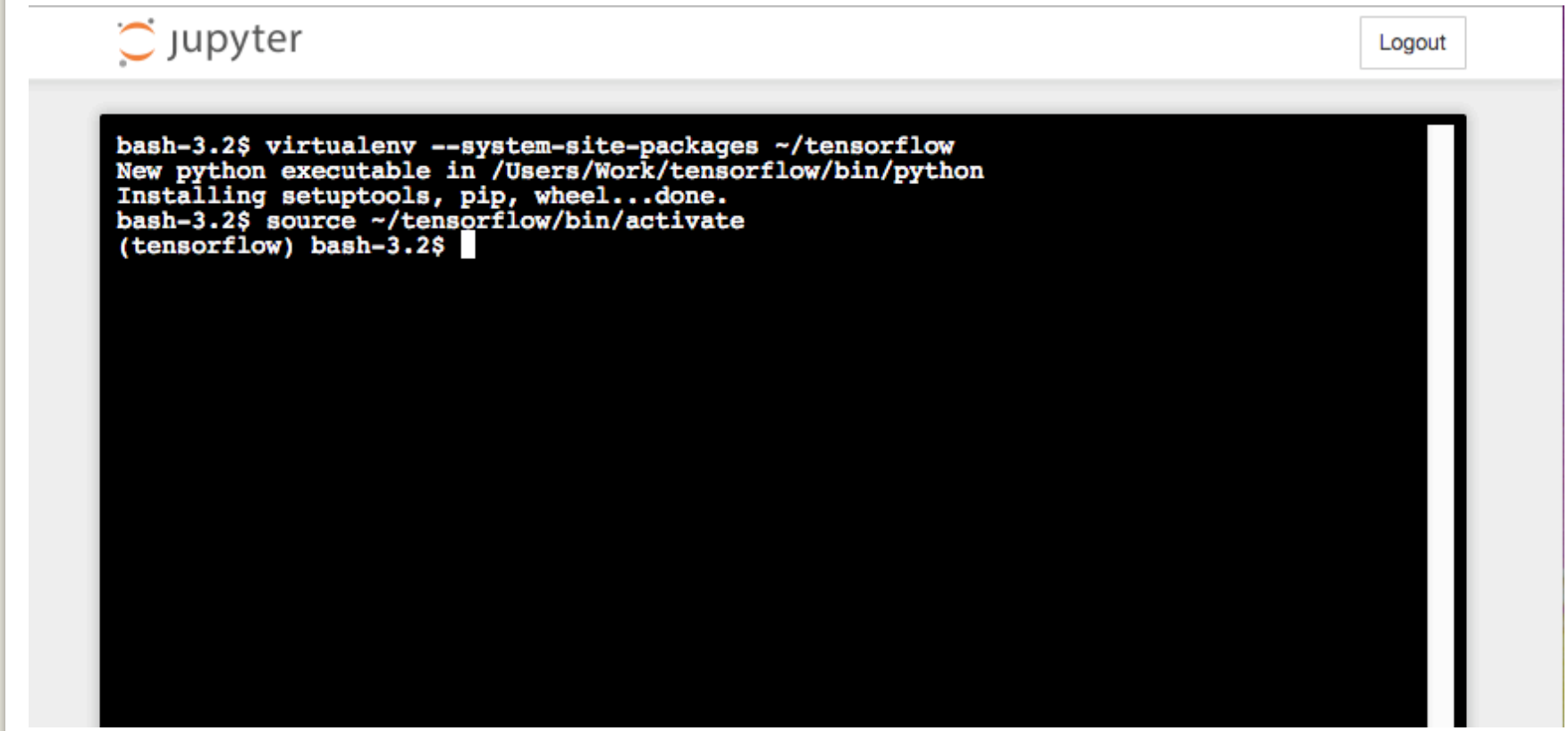
Getting Started

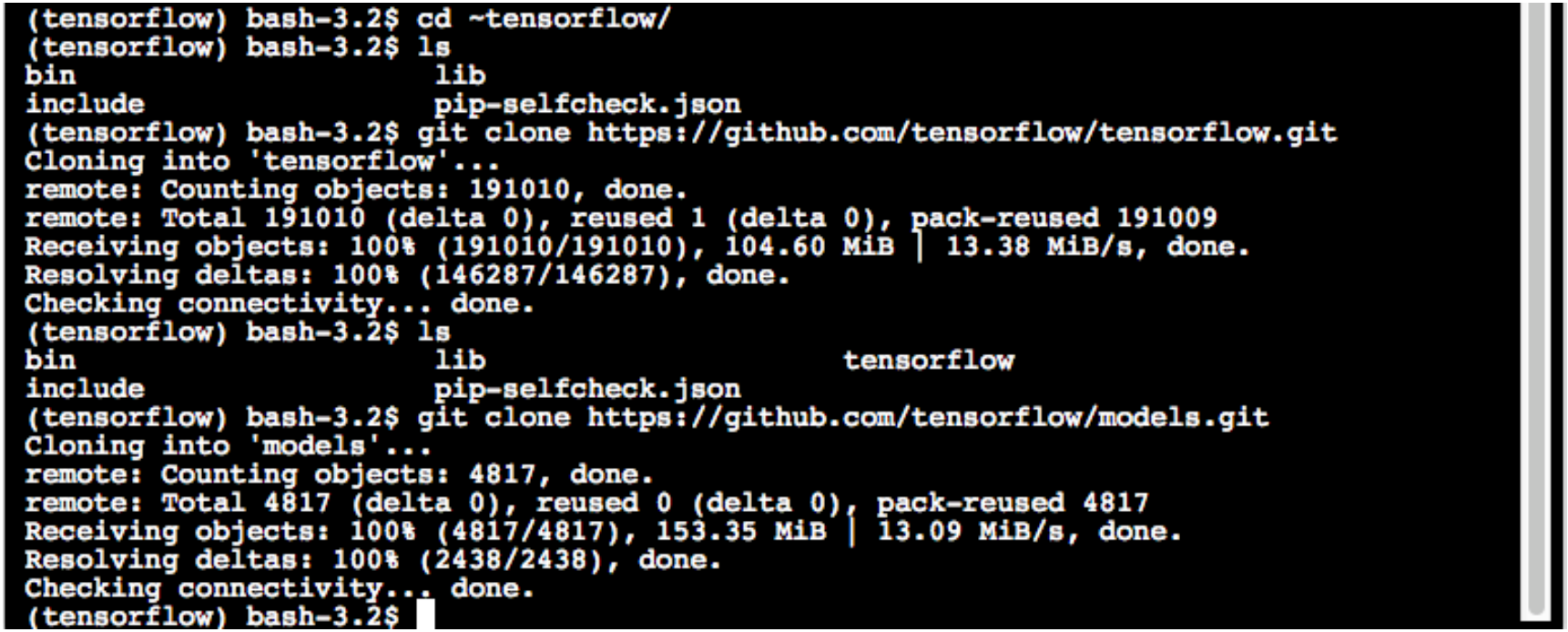
# SETTING UP TENSORFLOW ON YOUR LAPTOP (NOT IDEAL, AND DEMONSTRATES WHY WE NEED GPU ACCELERATED PLATFORMS LIKE BITFUSION)

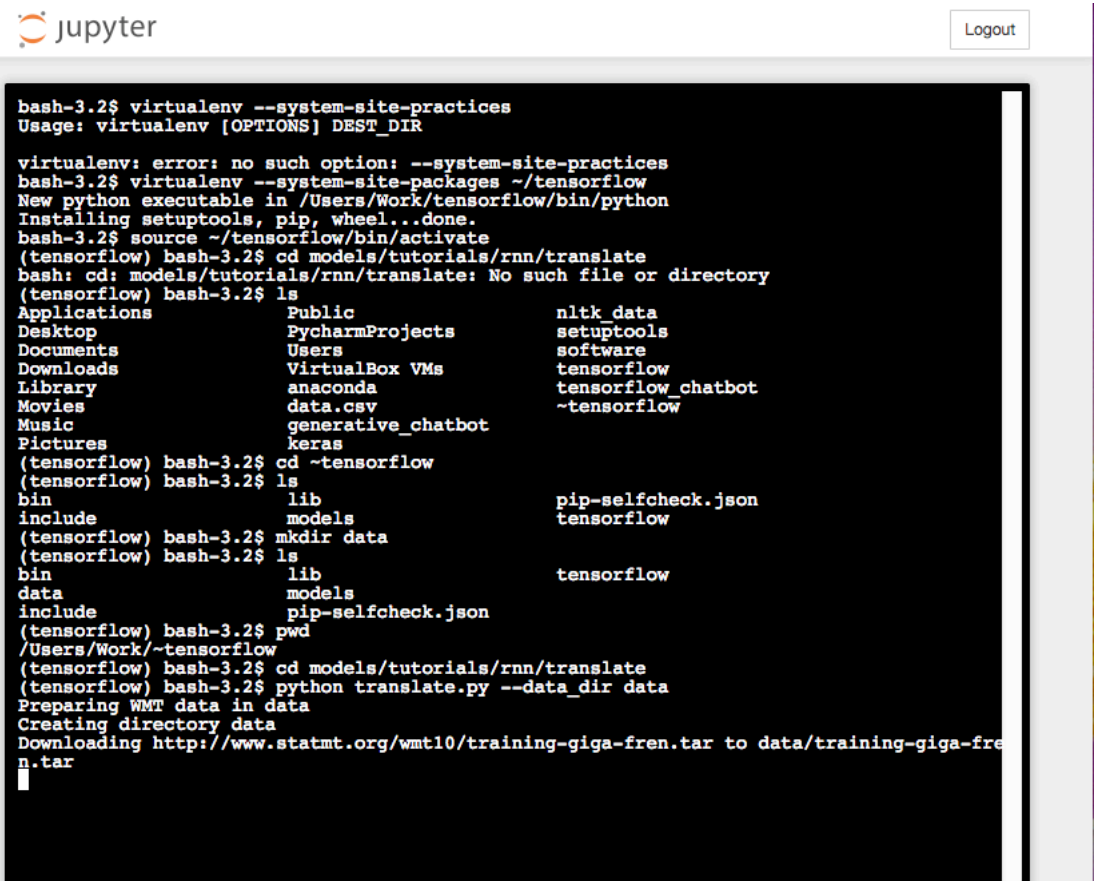






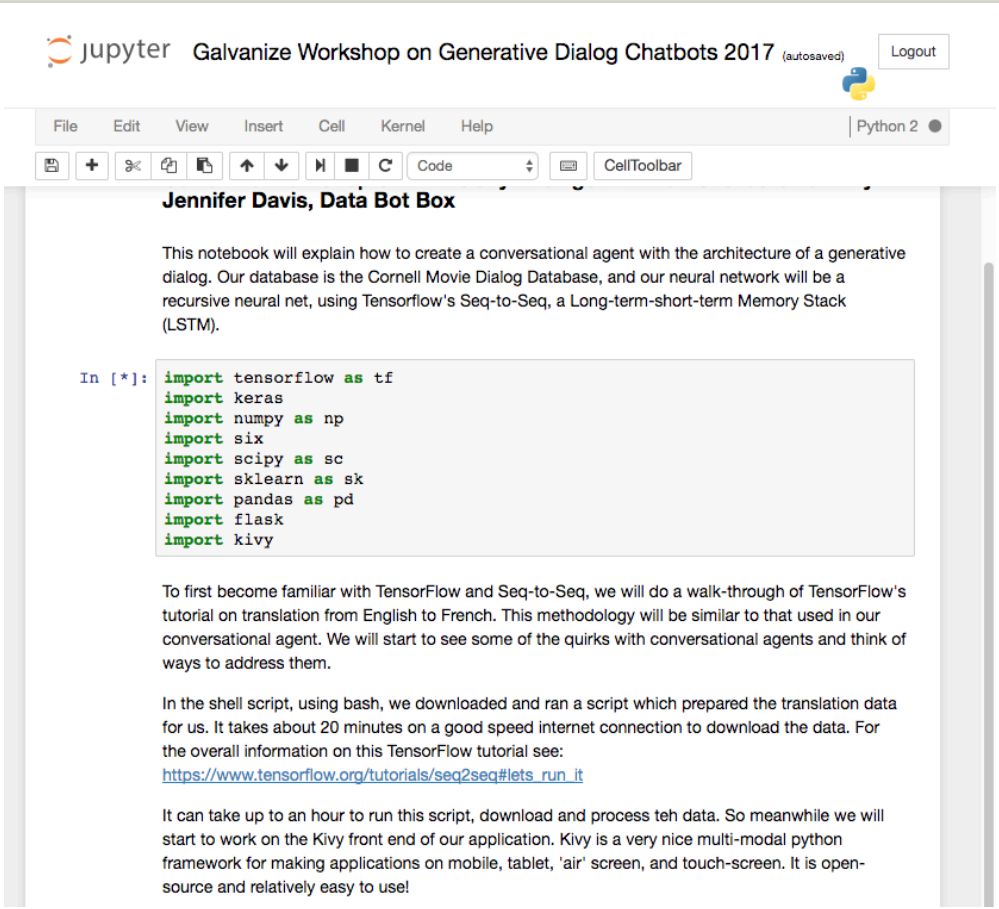




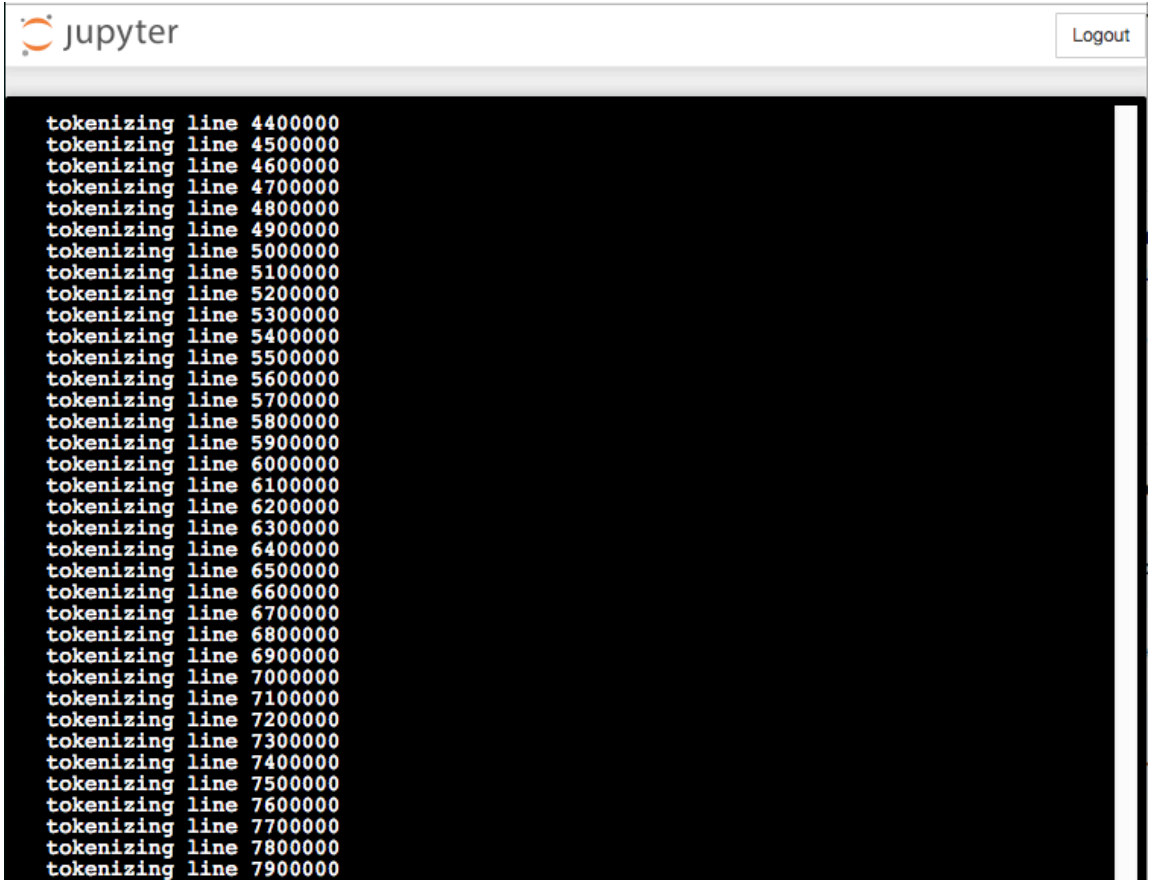


A first example – translation and idea to change to a ‘game’ of movie line quizzes!

# EXAMPLE I: BECOMING FAMILIAR WITH TENSORFLOW SEQ-2-SEQ MODEL WITH AN ENGLISH-FRENCH TRANSLATION



This takes >3 hours on a laptop using CPUs



## Running and Bucketing the translation

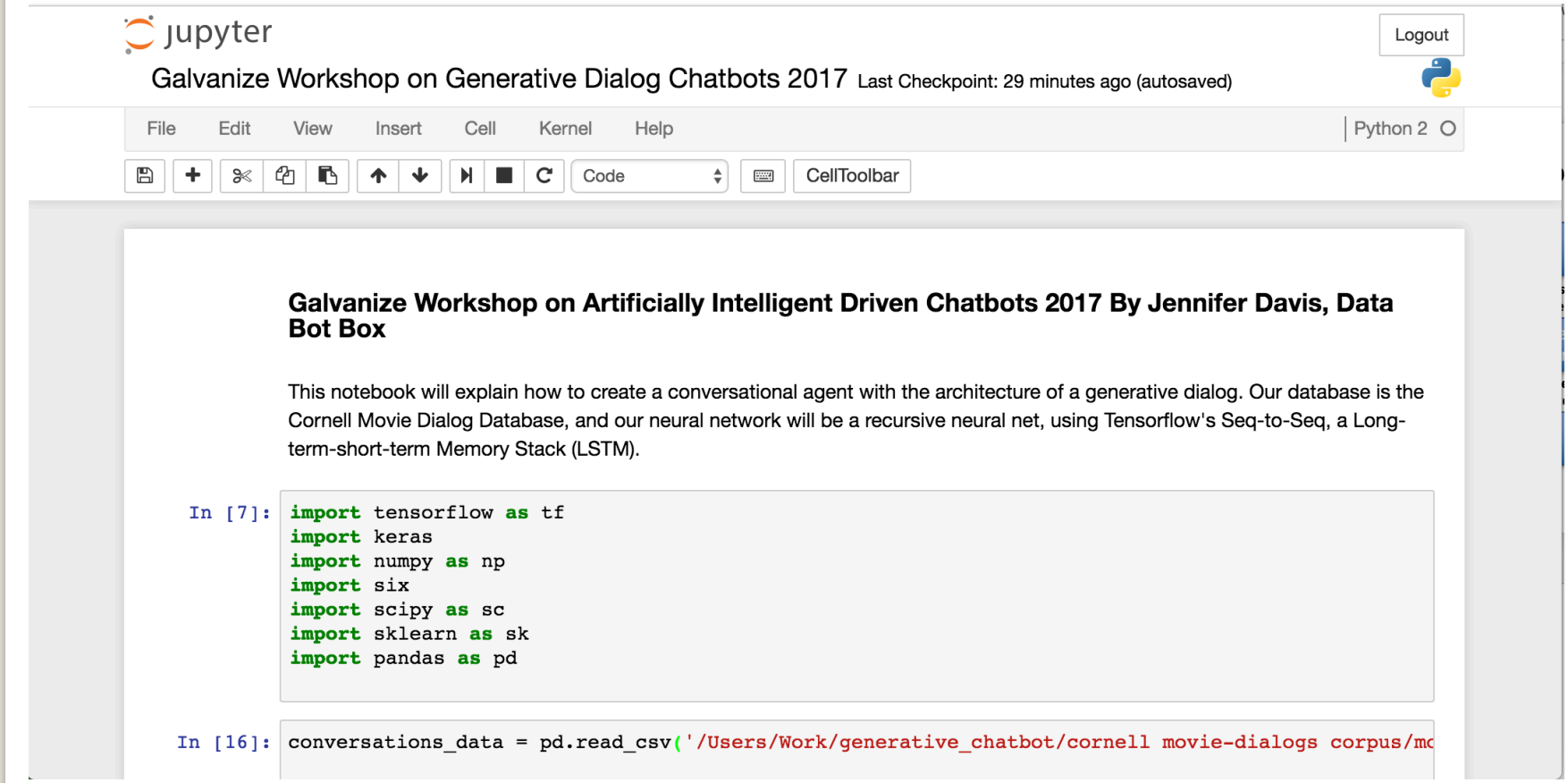
```
global step 200 learning rate 0.5000 step-time 1.39 perplexity 1720.62
  eval: bucket 0 perplexity 184.97
  eval: bucket 1 perplexity 248.81
  eval: bucket 2 perplexity 341.64
  eval: bucket 3 perplexity 469.04
global step 400 learning rate 0.5000 step-time 1.38 perplexity 379.89
  eval: bucket 0 perplexity 151.32
  eval: bucket 1 perplexity 190.36
  eval: bucket 2 perplexity 227.46
  eval: bucket 3 perplexity 238.66
```

## Command to begin translation

```
python translate.py
  --data_dir [your_data_directory] --train_dir [checkpoints_directory]
  --size=256 --num_layers=2 --steps_per_checkpoint=50
```

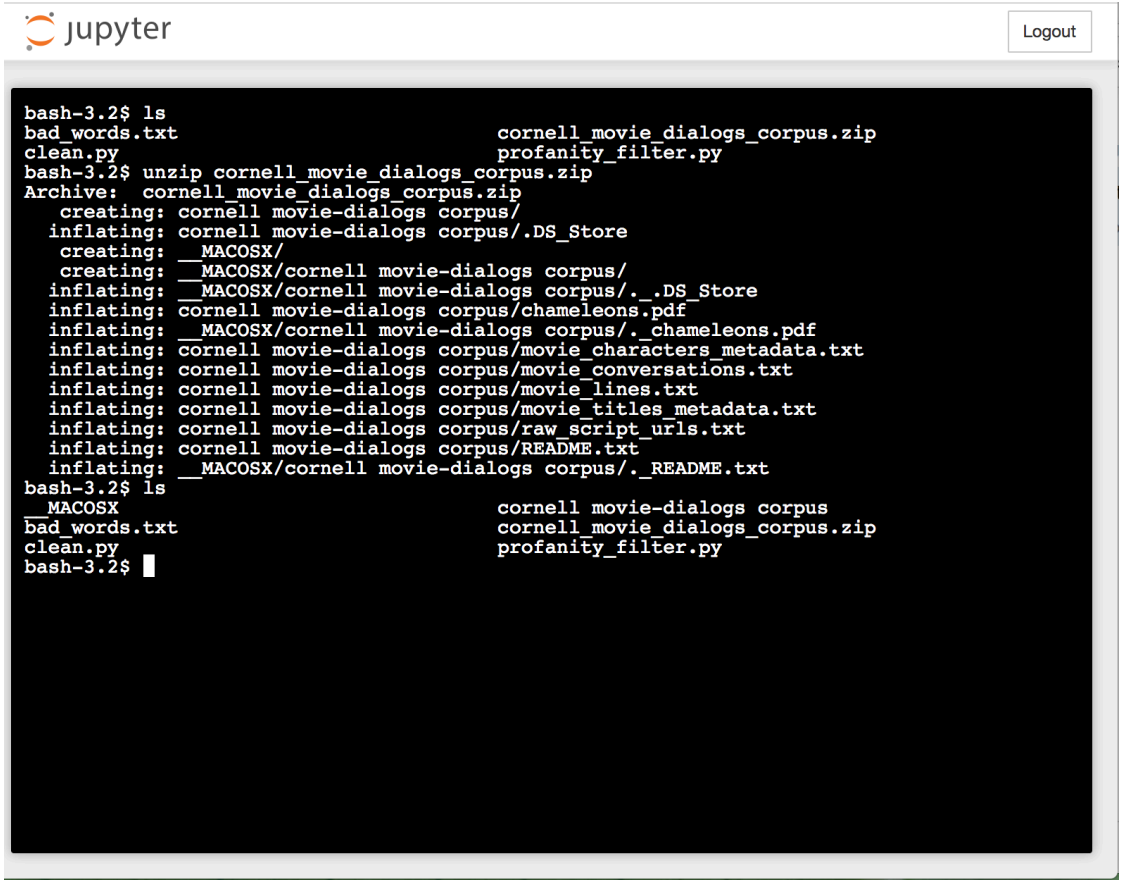
## Output of the translation

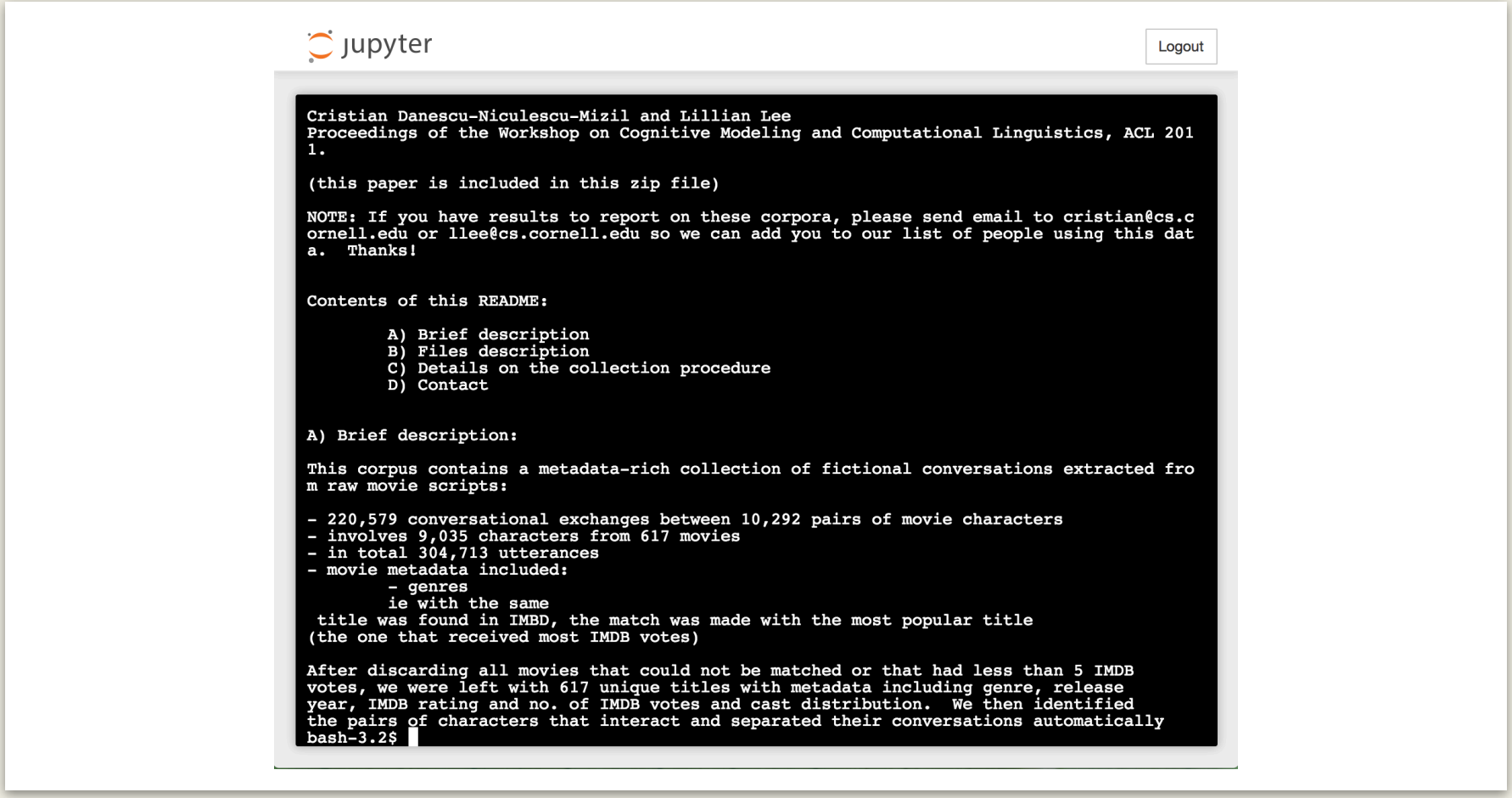
```
python translate.py --decode
  --data_dir [your_data_directory] --train_dir [checkpoints_directory]

Reading model parameters from /tmp/translate.ckpt-340000
>  Who is the president of the United States?
 Qui est le président des États-Unis ?
```



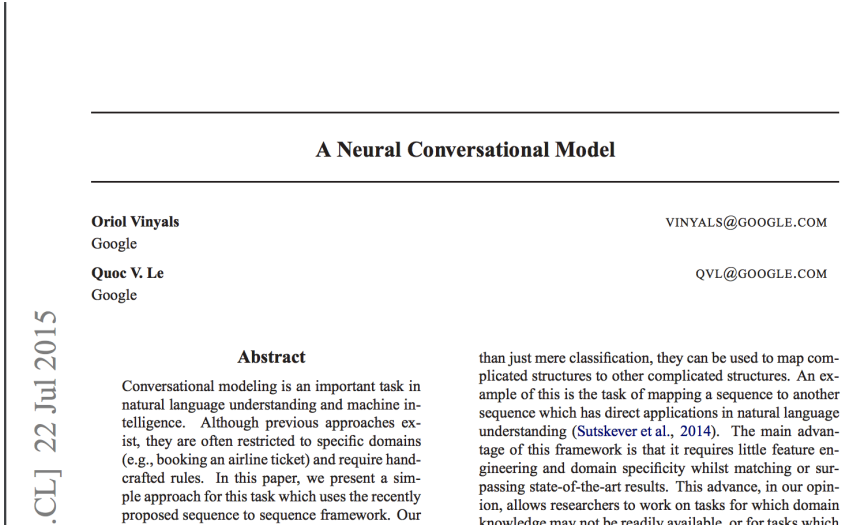
To make a chatbot based on movie dialog one would download the Cornell Movie Dialog Corpus (as demonstrated here) and follow a similar technique.

Instead of question and answer translation, ask the chat a line from a movie and get a response! It's a fun party-game with the correct user interface! Stay tuned to our repository for examples and updates.





# Seq2Seq Chatbots Based on Google's Neural Conversational Model



.CL] 22 Jul 2015

**A Neural Conversational Model**

**Oriol Vinyals** VINYALS@GOOGLE.COM
Google

**Quoc V. Le** QVL@GOOGLE.COM
Google

**Abstract**

Conversational modeling is an important task in natural language understanding and machine intelligence. Although previous approaches exist, they are often restricted to specific domains (e.g., booking an airline ticket) and require handcrafted rules. In this paper, we present a simple approach for this task which uses the recently proposed sequence to sequence framework. Our

than just mere classification, they can be used to map complicated structures to other complicated structures. An example of this is the task of mapping a sequence to another sequence which has direct applications in natural language understanding (Sutskever et al., 2014). The main advantage of this framework is that it requires little feature engineering and domain specificity whilst matching or surpassing state-of-the-art results. This advance, in our opinion, allows researchers to work on tasks for which domain knowledge may not be readily available, or for tasks which

[Example of Seq2Seq Chatbot on the Web]

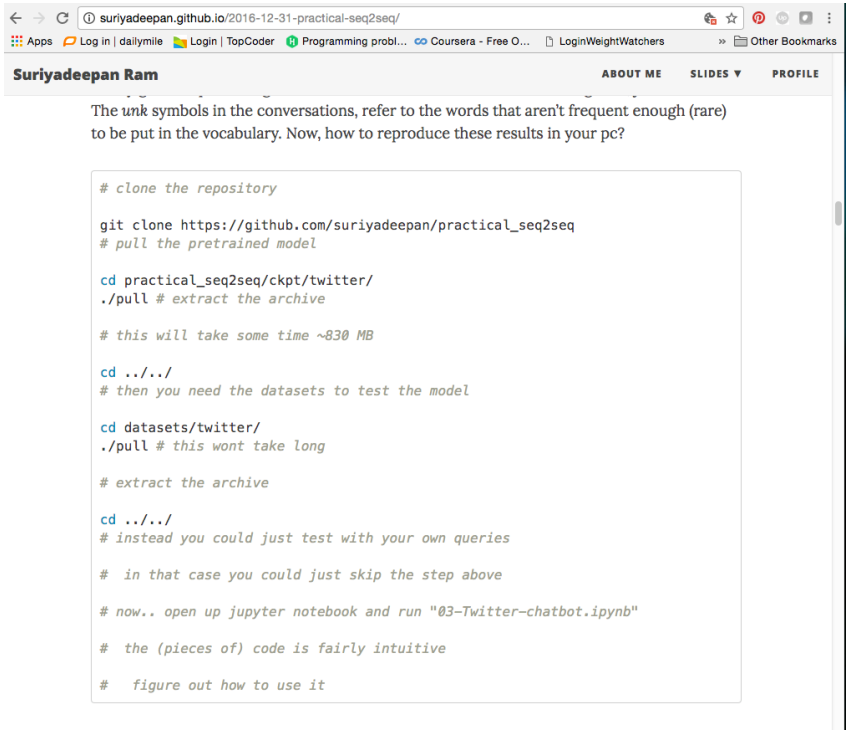
DATA BOT BOX



bitfusion

What would twitter say if it could talk to itself?

# EXAMPLE II: A CHATBOT MADE FROM TWITTER DATA



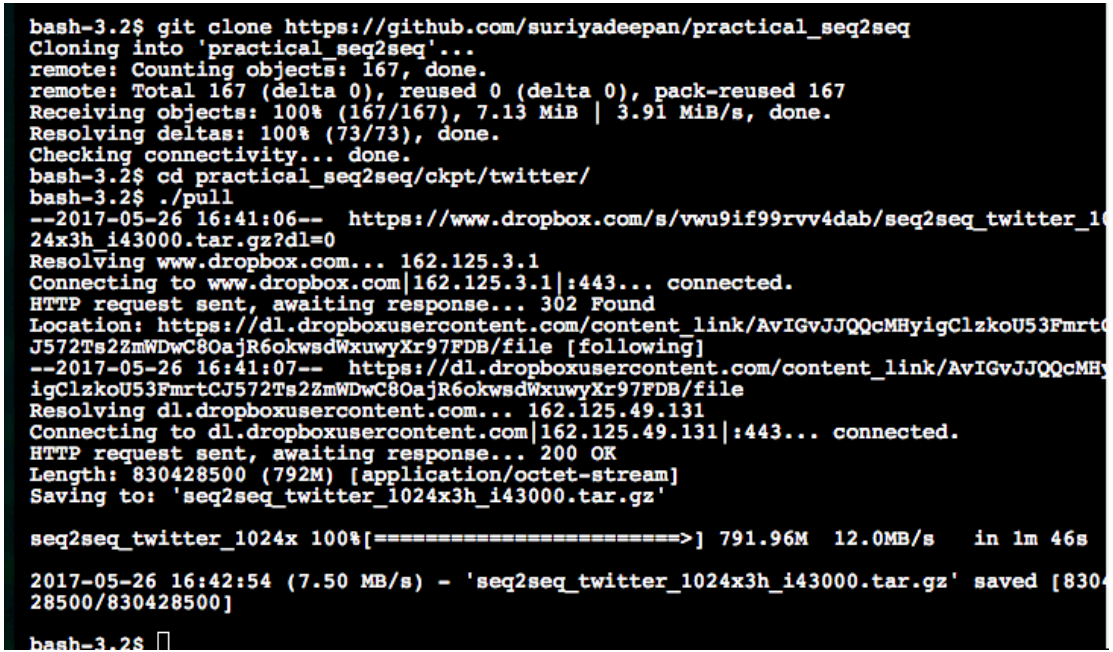
First we will clone Suriyadeepan's Practical Seq2Seq repository. He has very clear instructions on how to run his code.

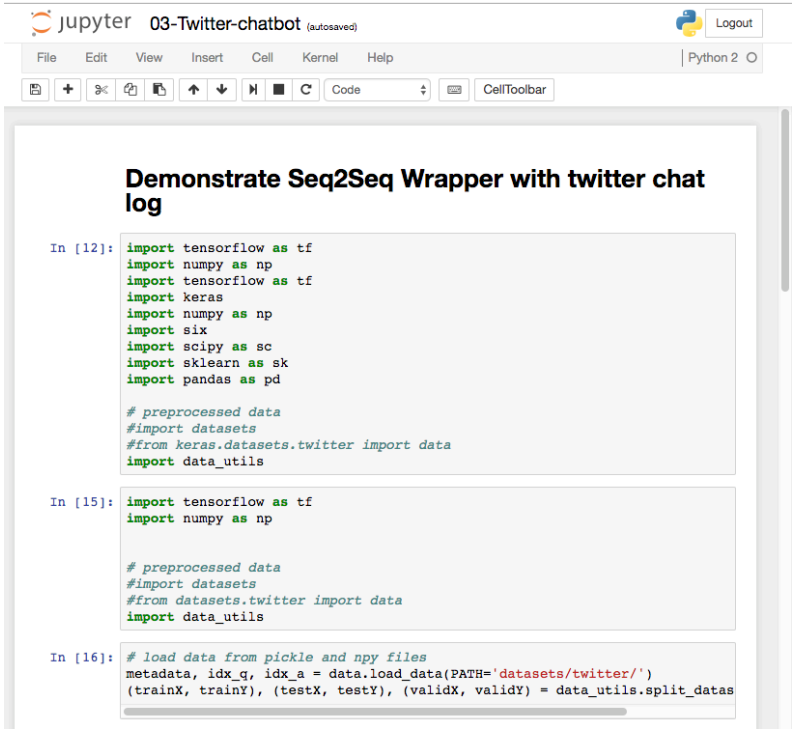
*For fun, try running his twitter bot on Reddit data. We'll post that after today's workshop so stay tuned to the Github repo!!*

```
bash-3.2$ git clone https://github.com/suriyadeepan/practical_seq2seq
Cloning into 'practical_seq2seq'...
remote: Counting objects: 167, done.
remote: Total 167 (delta 0), reused 0 (delta 0), pack-reused 167
Receiving objects: 100% (167/167), 7.13 MiB | 3.91 MiB/s, done.
Resolving deltas: 100% (73/73), done.
Checking connectivity... done.
bash-3.2$ cd practical_seq2seq/ckpt/twitter/
bash-3.2$ ./pull
--2017-05-26 16:41:06--  https://www.dropbox.com/s/vwu9if99rvv4dab/seq2seq_twitter_1
24x3h_i43000.tar.gz?dl=0
Resolving www.dropbox.com... 162.125.3.1
Connecting to www.dropbox.com|162.125.3.1|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://dl.dropboxusercontent.com/content_link/AvIGvJJQQcMHyigClzkoU53Fmrt
J572Ts2ZmWDwC8OajR6okwsdWxuwyXr97FDB/file [following]
--2017-05-26 16:41:07--  https://dl.dropboxusercontent.com/content_link/AvIGvJJQQcMH
igClzkoU53FmrtCJ572Ts2ZmWDwC8OajR6okwsdWxuwyXr97FDB/file
Resolving dl.dropboxusercontent.com... 162.125.49.131
Connecting to dl.dropboxusercontent.com|162.125.49.131|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 830428500 (792M) [application/octet-stream]
Saving to: 'seq2seq_twitter_1024x3h_i43000.tar.gz'

seq2seq_twitter_1024x 100%[=======================>] 791.96M  12.0MB/s   in 1m 46s

2017-05-26 16:42:54 (7.50 MB/s) - 'seq2seq_twitter_1024x3h_i43000.tar.gz' saved [830
28500/830428500]

bash-3.2$
```

Okay, now you have downloaded all the data, processed it, and run your twitter bot! Let's go to the graphical user interface in our Jupyter notebook to see what kinds of responses we achieved!

*For fun, try running his twitter bot on Reddit data. We'll post that after today's workshop so stay tuned to the Github repo!!*





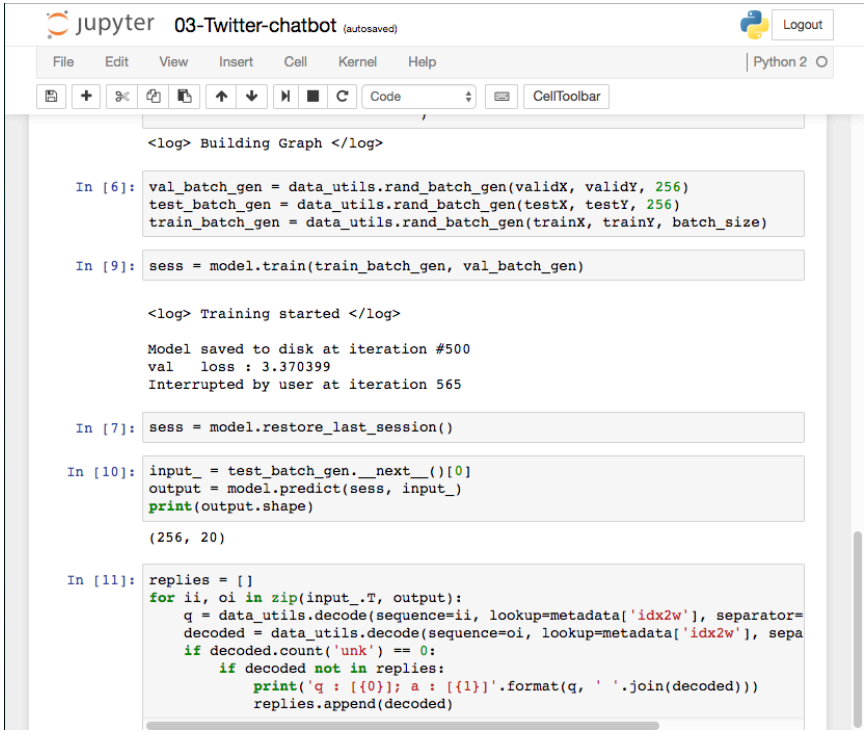
In [4]:
```
import seq2seq_wrapper
```

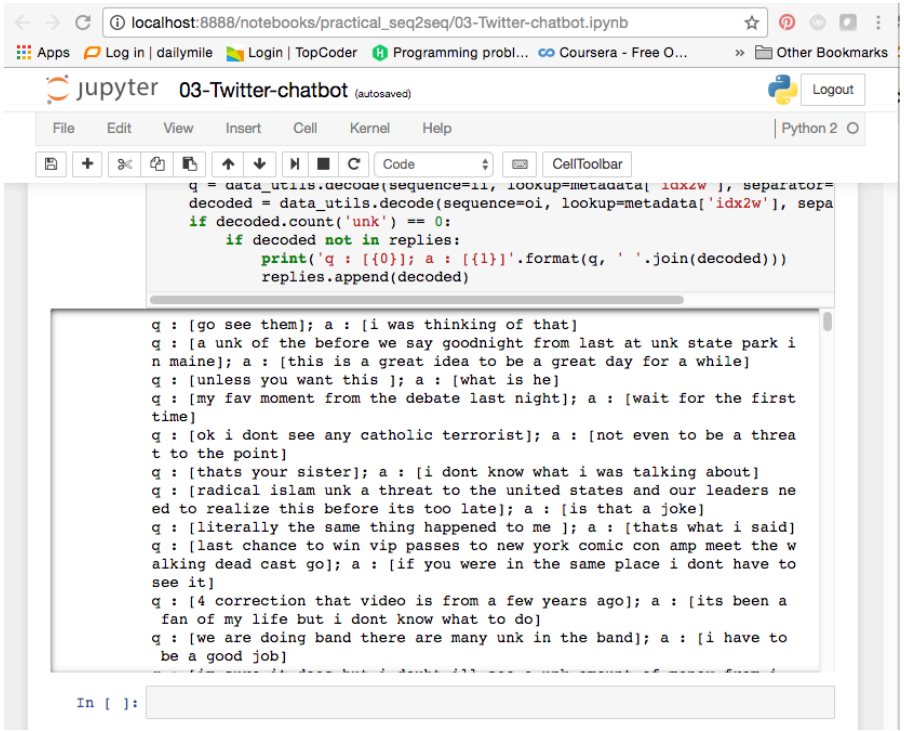
In [6]:
```
import importlib
importlib.reload(seq2seq_wrapper)
```

Out[6]:
```
<module 'seq2seq_wrapper' from '/home/suriya/_/tf/tf-seq2seq-wrapper/seq2
seq_wrapper.py'>
```

In [5]:
```
model = seq2seq_wrapper.Seq2Seq(xseq_len=xseq_len,
                                yseq_len=yseq_len,
                                xvocab_size=xvocab_size,
                                yvocab_size=yvocab_size,
                                ckpt_path='ckpt/twitter/',
                                emb_dim=emb_dim,
                                num_layers=3
                                )
```

```
<log> Building Graph </log>
```

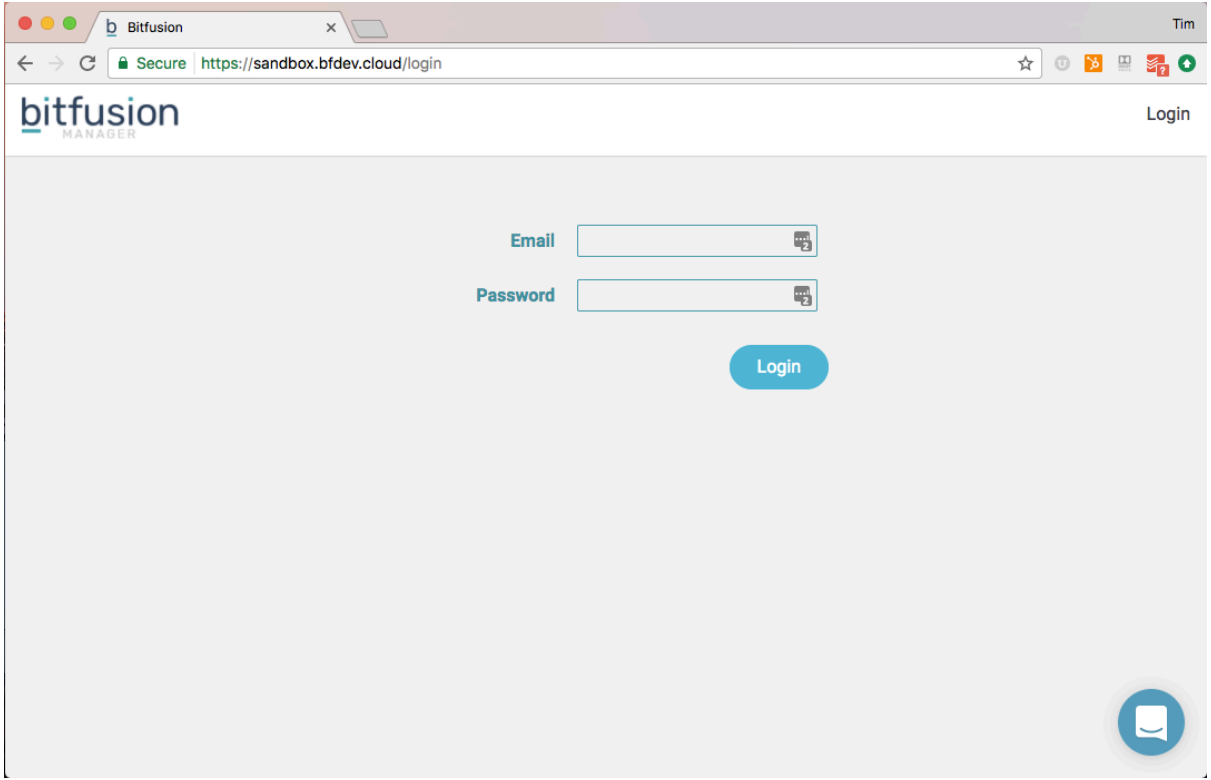




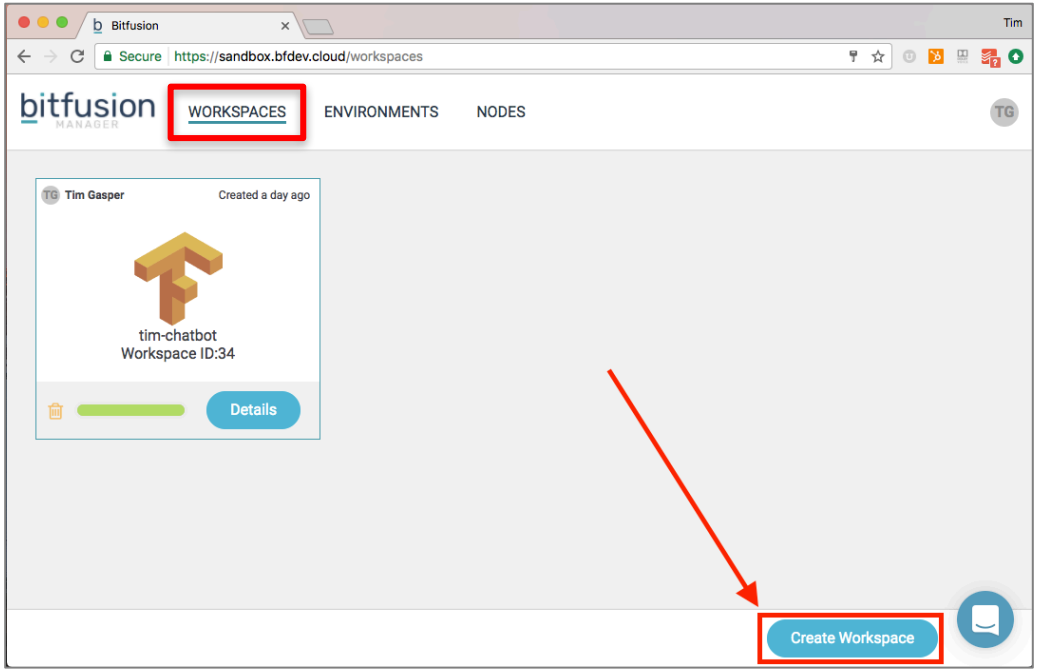
Why use GPU/CPU Platforms?

# EXAMPLE III: THE BENEFITS OF USING A GPU PLATFORM LIKE BITFUSION TO TRAIN AN AI-DRIVEN CHATBOT

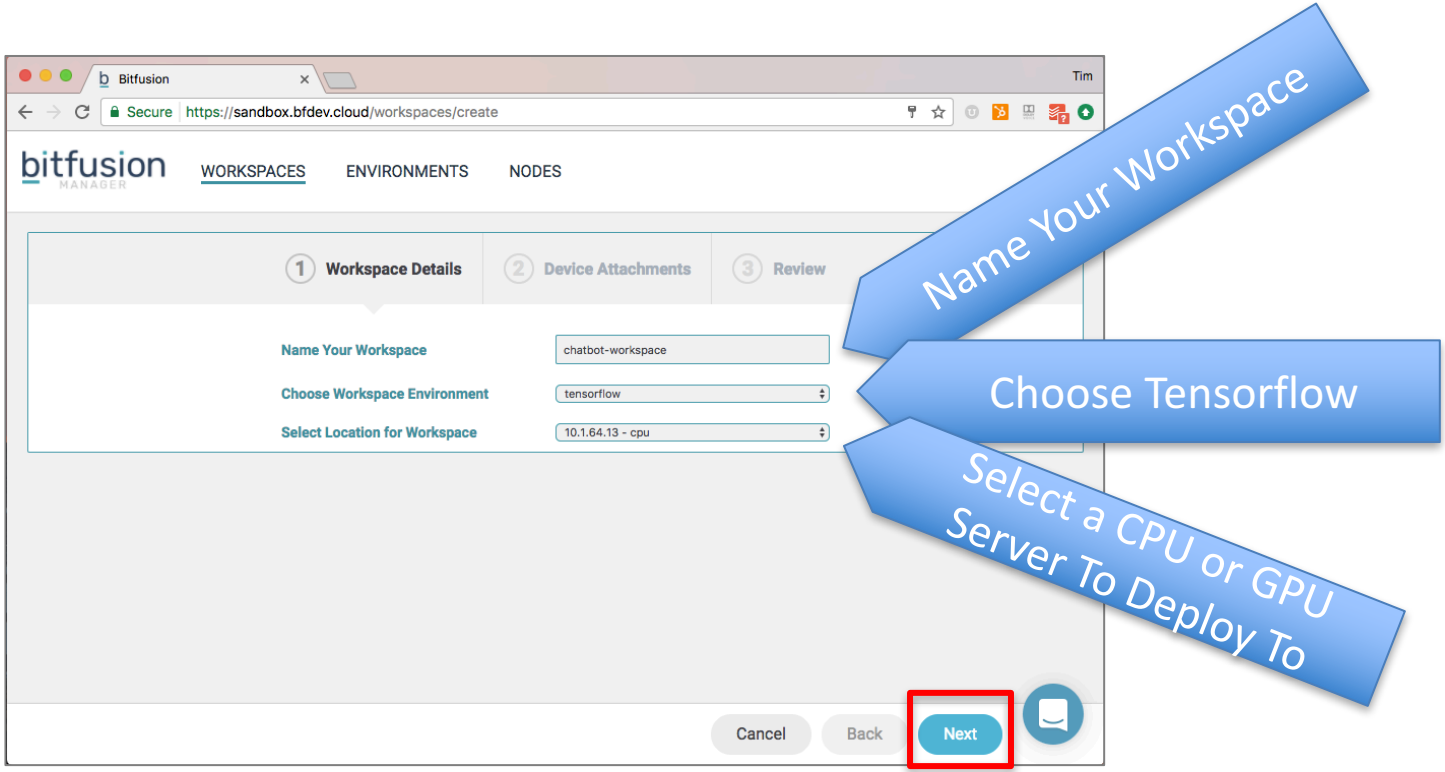
# Step I: Log-in to the platform



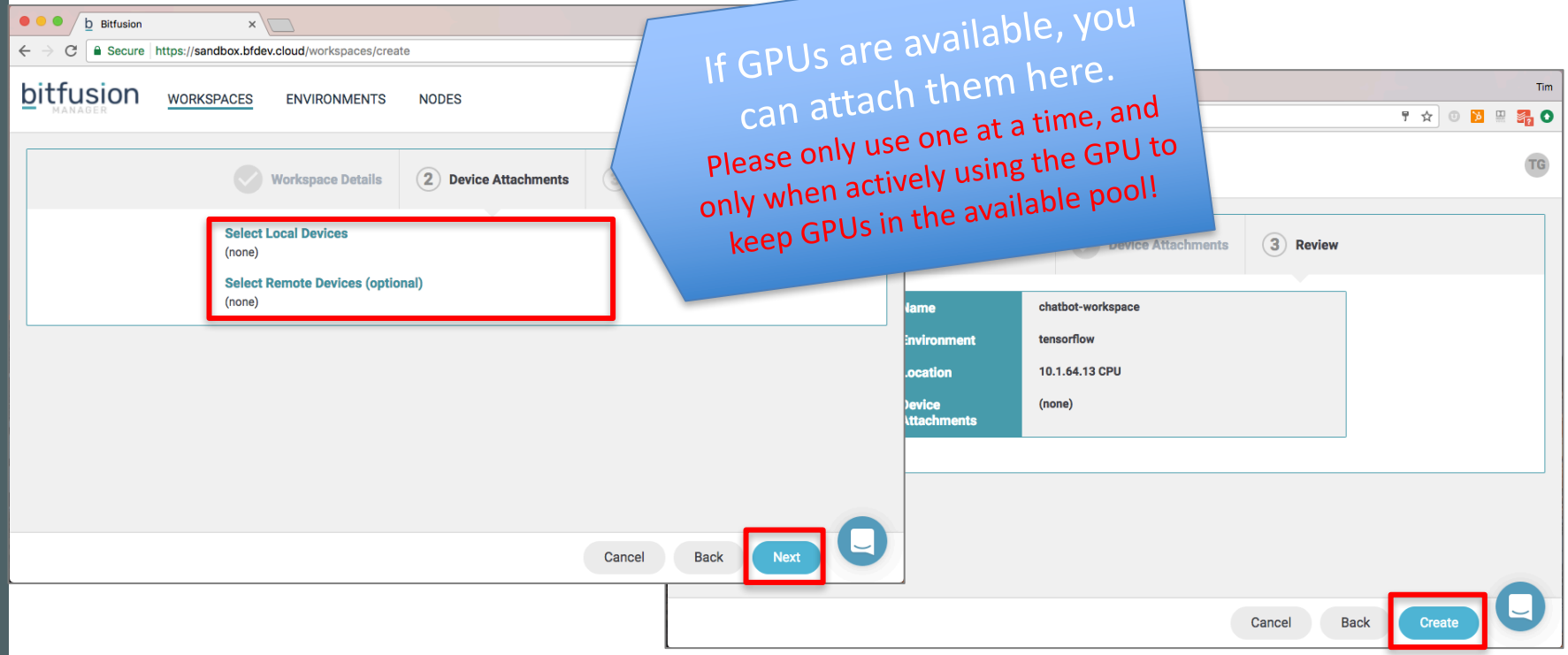
# Step 2A: Create a Workspace



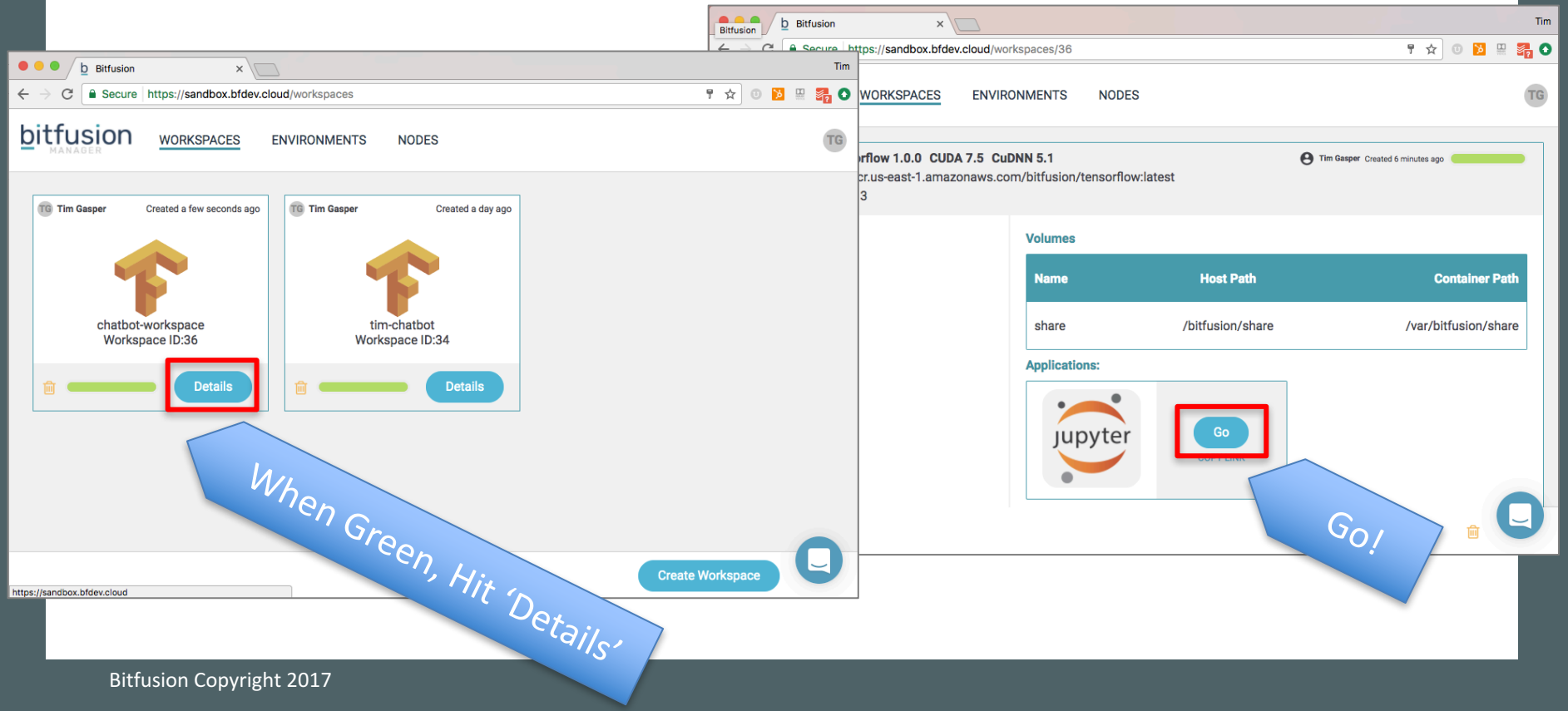
# Step 2B: Create Workspace Details



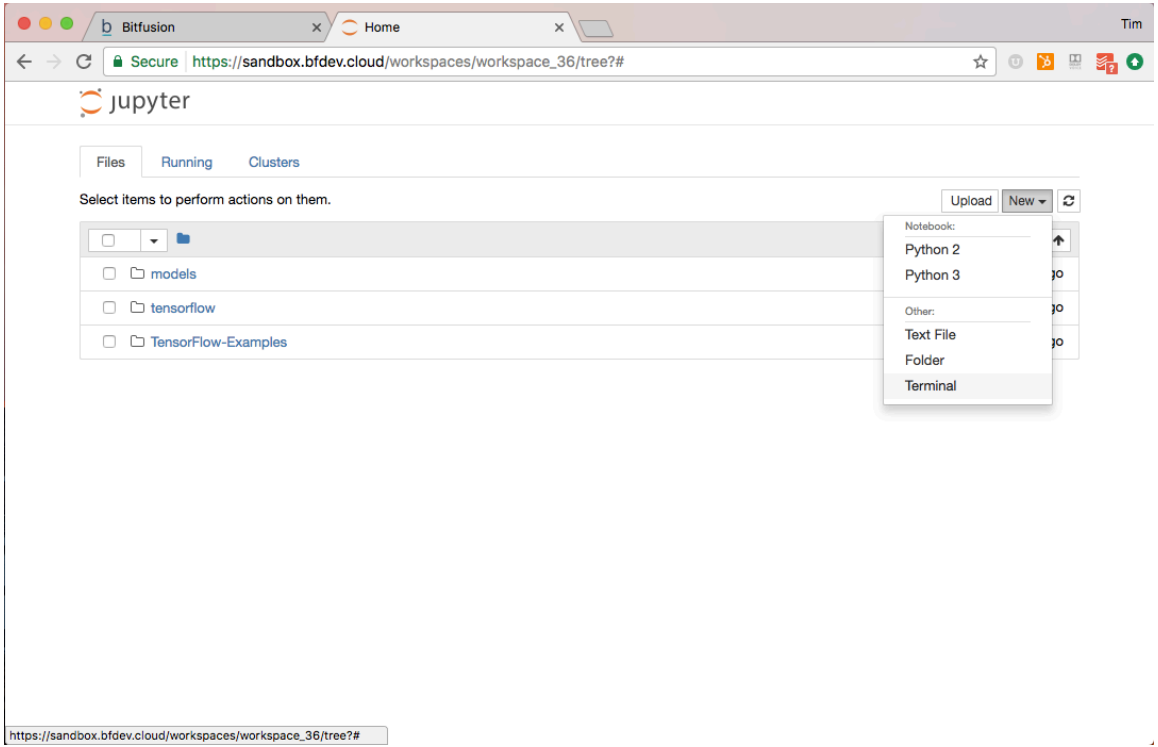
# Step 2C: Finalize Workspace Options



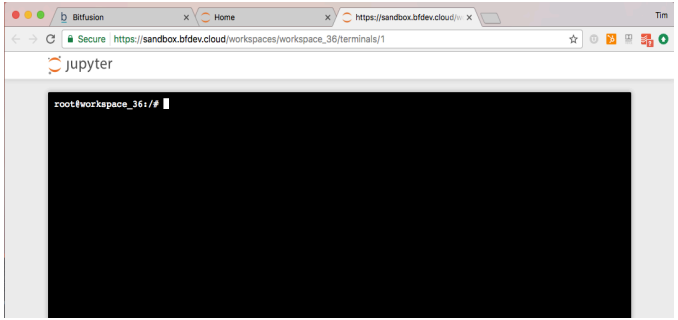
# Step 3: Access Jupyter



# Step 4: Open Terminal



# Step 5: Run the Following Commands

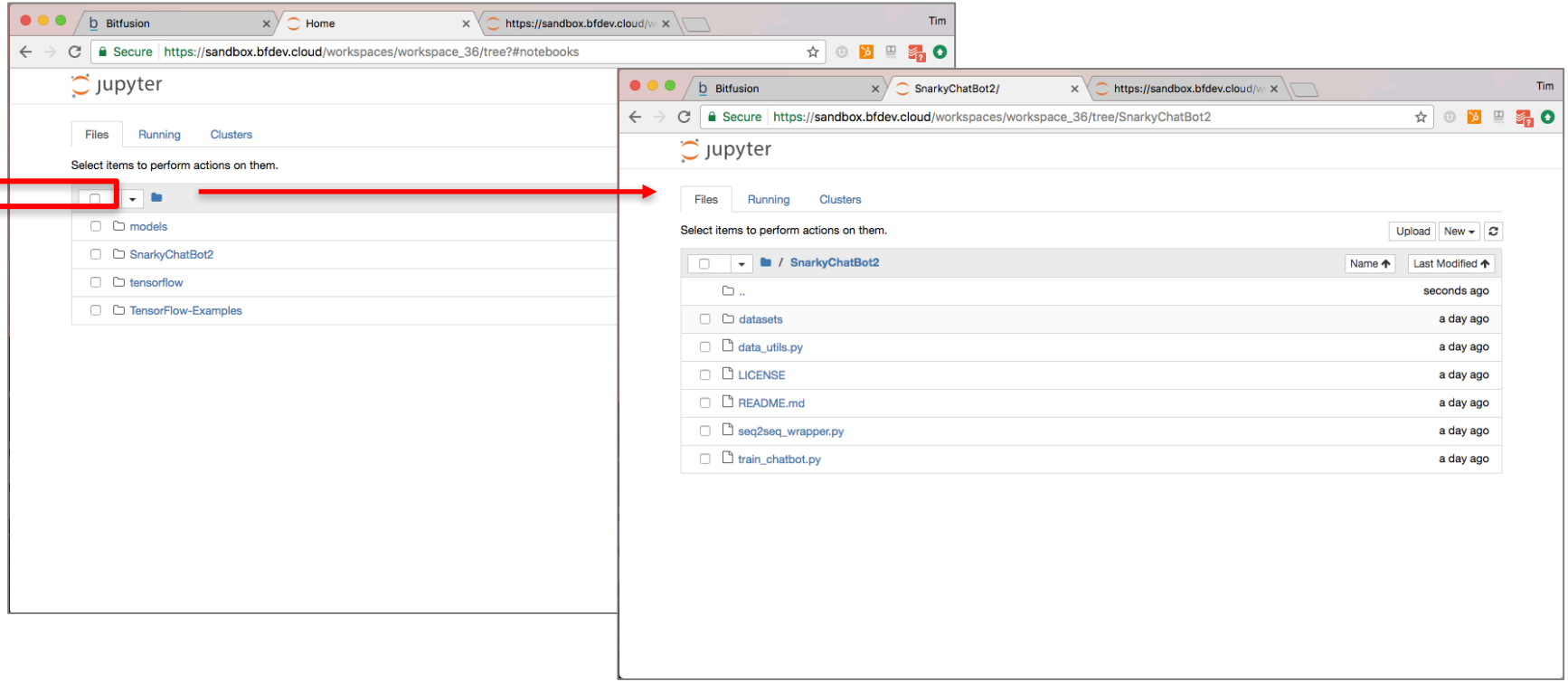



We have the data and code you need in the shared filesystem! Link it into Jupyter by running:

- `ln -s /var/bitfusion/share/SnarkyChatBot2/ /opt/pynb/SnarkyChatBot2`

(if you want to assume there is no shared filesystem and set up from scratch ping me tim@bitfusion.io and I'll send you an additional set of instructions)

# Step I: Log-in to the platform



jupyter train_chatbot.py ✔ Yesterday at 10:00 AM

File Edit View Language Python

```python
# preprocessed data
from datasets.may_reddit import data
from data_utils import split_dataset, rand_batch_gen
import seq2seq_wrapper

# load data from pickle and npy files
metadata, idx_q, idx_a = data.load_data(PATH='datasets/may_reddit/')
(trainX, trainY), (testX, testY), (validX, validY) = split_dataset(idx_q,
                                                                   idx_a)

# parameters
xseq_len = trainX.shape[-1]
yseq_len = trainY.shape[-1]
batch_size = 32
xvocab_size = len(metadata['idx2w'])
yvocab_size = xvocab_size
emb_dim = 1024


# In[7]:

model = seq2seq_wrapper.Seq2Seq(xseq_len=xseq_len,
                                yseq_len=yseq_len,
                                xvocab_size=xvocab_size,
                                yvocab_size=yvocab_size,
                                ckpt_path='ckpt/reddit/',
                                emb_dim=emb_dim,
                                num_layers=3)


```

# Step 6A: Chatbot Model Training via CLI

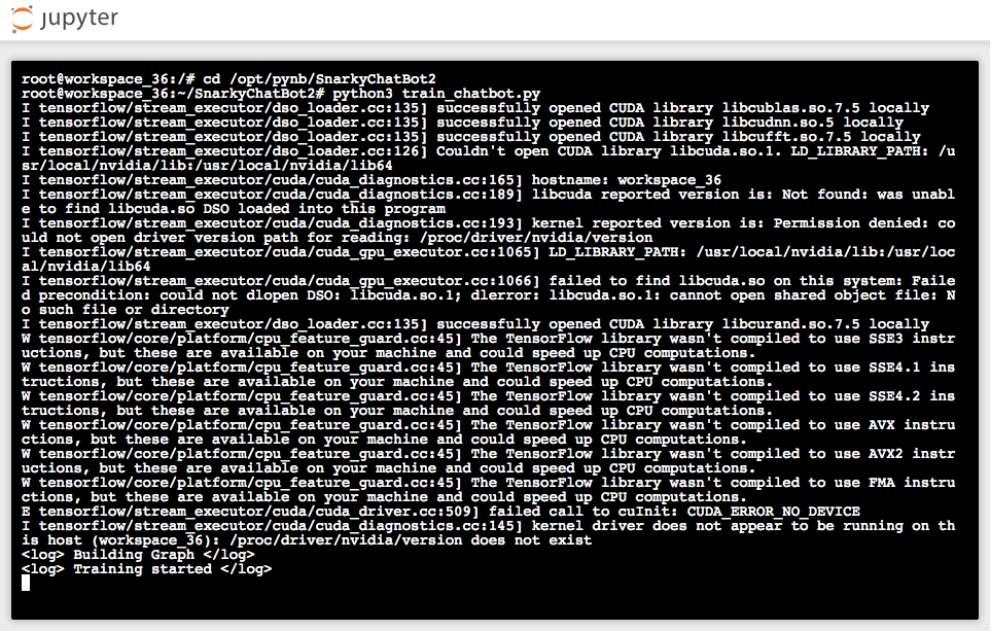
In the terminal window…

Navigate to the SnarkyChatBot2 folder

- `cd /opt/pynb/SnarkyChatBot`

Run train_chatbot.py

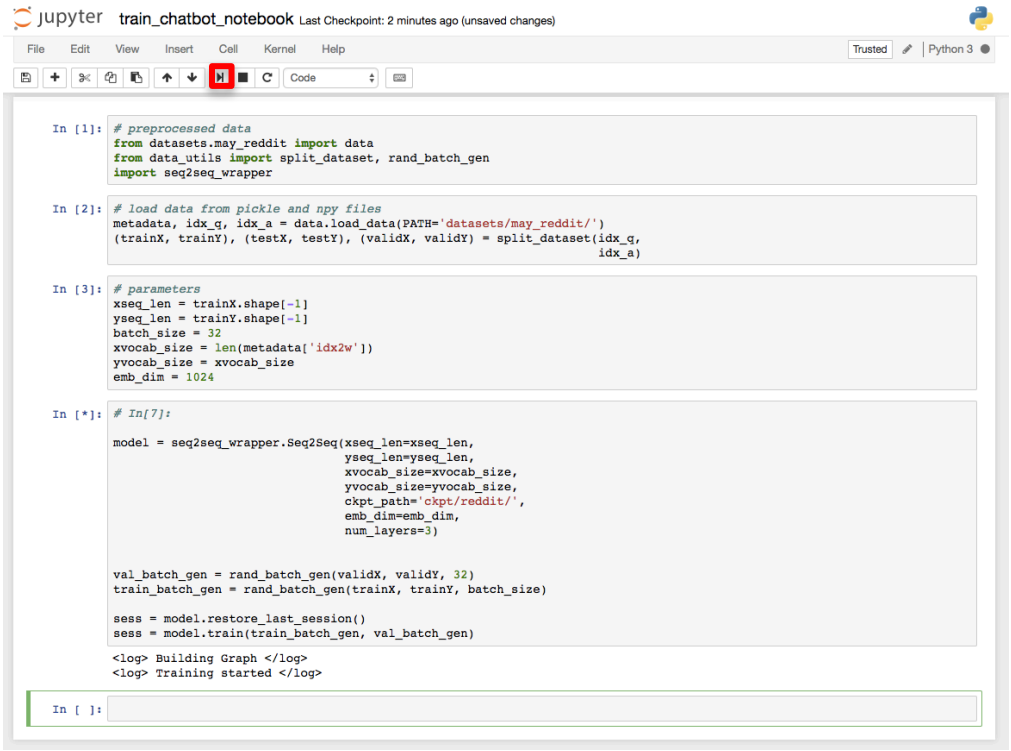
- `python3 train_chatbot.py`



# Step 6B: Chatbot Model Training via Notebook

In Jupyter…

Click on:
train_chatbot_notebook.ipynb
and hit the play/pause button for each of the code cells!



# Bitfusion Platform

- Makes development of AI-driven software simple
- Train, tune and optimize models with low visibility and minimal optimization
- Save several months in development and years in production for artificial intelligence products

DATA BOT BOX



bitfusion

# Benefits of Bitfusion Platform

- Abstracts the need to create a separate training environment (GPU) from the running environment (CPU) for the chatbot
- Removes the need to create a complex Hadoop-like software integration platform de novo

DATA BOT BOX



bitfusion

# DEEP LEARNING AND AI ARE RADICALLY CHANGING OUR LIVES AND THE WAY WE DO BUSINESS

# AI Revolution

| | |
|---|---|
| ROBOTICS | Computer Vision & Speech, Drones, Droids |
| ENTERTAINMENT | Interactive Virtual & Mixed Reality |
| AUTOMOTIVE | Self-Driving Cars, Co-Pilot Advisor |
| FINANCE | Predictive Price Analysis, Dynamic Decision Support |
| PHARMA | Drug Discovery, Protein Simulation |
| HEALTHCARE | Predictive Diagnosis, Wearable Intelligence |
| ENERGY | Geo-Seismic Resource Discovery |
| EDUCATION | Adaptive Learning Courses |
| SALES | Adaptive Product Recommendations |
| SUPPLY CHAIN | Dynamic Routing Optimization |
| CUSTOMER SERVICE | Bots And Fully-Automated Service |
| MAINTENANCE | Dynamic Risk Mitigation And Yield Optimization |

bitfusion

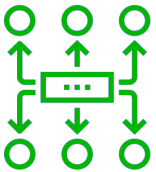
# Deep Learning with the Do-It-Yourself Approach


"The time scale and process for building AI
is more like developing hardware rather than agile software."

# INDUSTRY PROBLEM

## Development Challenges

- Installing and Constantly Updating Software and Drivers
- Transitioning from Development to Training to Deployment
- Single-Threaded Model Training With Massive Wait Times



## Management Challenges

- Expensive, Specialized Infrastructure Sitting Idle
- No Centralized Policy Management
- Poor Tools for Managing and Monitoring GPUs and other Co-Processors

## Scale Challenges

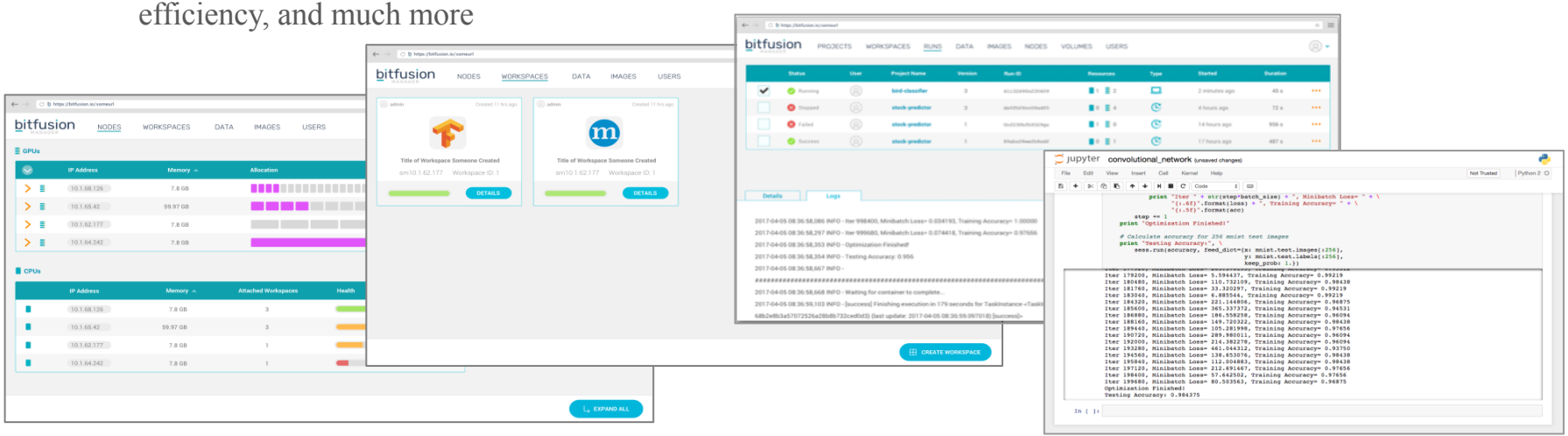
- Massive Increases in Infrastructure Spending to Get Speed Ups
- Managing Shared Resources Across Multiple Workloads, Users, and Data Sets

bitfusion

# Bitfusion Flex

End-to-end, elastic infrastructure for building deep learning and AI applications

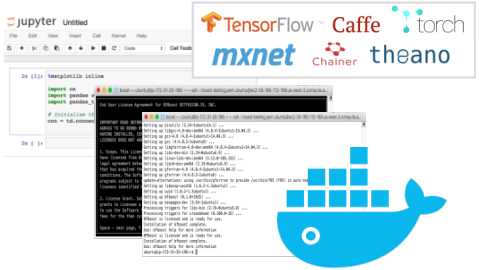
- Can utilize RDMA and Infiniband when remote GPUs are attached
- Never have to transition beyond multi-GPU code environment (remote servers look like local GPUs and can be utilized without code changes)
- Rich CLI & GUI, interactive Jupyter workspaces, batch scheduling, smart shared resourcing for max efficiency, and much more




bitfusion

# The Deep Learning and AI Lifecycle with Bitfusion Flex

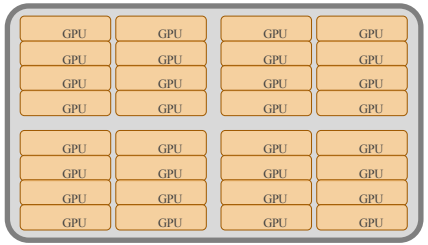
## 1 DEVELOP




Develop on pre-installed, quick start deep learning containers.

- Get to work quickly with workspaces with optimized pre-configured drivers, frameworks, libraries, and notebooks.
- Start with CPUs, and attach Elastic GPUs on-demand.
- All your code and data is saved automatically and sharable with others.

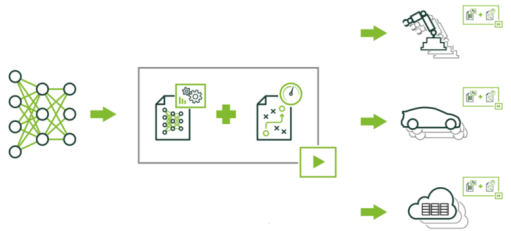
## 2 TRAIN




Transition from development to training with multiple GPUs.

- Seamlessly scale out to more GPUs on a shared training cluster to train larger models quickly and cost-effectively.
- Support and manage multiple users, teams, and projects.
- Train multiple models in parallel for massive productivity improvements.

## 3 DEPLOY



Push trained, finalized models into production.

- Deploy a trained neural network into production and perform real-time inference across different hardware.
- Manage multiple AI applications and inference endpoints corresponding to different trained models.

bitfusion

# Value Proposition

## Deep Learning with the Do-It-Yourself Approach


## Deep Learning with Bitfusion


bitfusion

# Getting Started

## Enterprise
### Software Platform

- Deploy in your own cloud or data center
- Per node pricing
- Manager GUI and command line interface
- No-setup software, interactive workspaces, job runner w/ parallel training, and smart resourcing
- Advanced user, container, and resource management features
- Enterprise support & SLAs available

## Sandbox
### Hosted

- Hosted and managed by Bitfusion
- Free for evaluation purposes
- Manager GUI and command line interface
- No-setup software, interactive workspaces, job runner w/ parallel training, and smart resourcing
- Basic support

bitfusion

# How to Reach Bitfusion (for more of our Awesome Platform)

- How to reach Bitfusion:
  - Business: https://bitfusion.io/
    tim@bitfusion.io
    1-866-750-9656
    @bitfusionio
  - Individual: @timgasper

DATA BOT BOX



bitfusion

# How to Reach Data Bot Box, LLC

- Web: https://www.databotbox.com
  - Business: info@databotbox.com
  - Workshops: jennifer.d.davis@databotbox.com
  - Twitter: @databotbox

DATA BOT BOX



bitfusion

Thanks for your attention!

# THE END

# References


- Conversational Informatics: A Data Intensive Approach with Empahsis on Nonverbal Communication, Nishida et. al., Springer 2014
- Facebook messenger chatbot: Adweek, October 14, 2016: http://www.adweek.com/digital/scott-horn-247-guest-post-chat-bot-technology-consumer-intent/
- WFM chatbot: Venture Beat, July 12, 2016 : https://venturebeat.com/2016/07/12/whole-foods-just-launched-a-messenger-chatbot-for-finding-recipes-with-emojis/
- Heyday chatbot: Business Insider: October 19, 2016: http://www.businessinsider.com/debate-trump-clinton-chat-bots-2016-10
- Amazon Lex: https://aws.amazon.com/lex/
- The Chatbot Will See you Now: The New Yorker, December 25, 2016: http://www.newyorker.com/tech/elements/the-chatbot-will-see-you-now
- Google's Deep Mind Expert, Blog WildMind: http://www.wildml.com/2016/04/deep-learning-for-chatbots-part-1-introduction/


DATA BOT BOX



bitfusion

# Where to find the Code and Datasets

- https://github.com/Data-Bot-Box
- https://github.com/niderhoff/nlp-datasets
- https://www.kaggle.com/reddit/reddit-comments-may-2015
- Suriyadeepan.github.io/2016-06-28-easy-seq2seq/
- https://www.tensorflow.org/tutorials/seq2seq
- https://deeplearning4j.org/lstm
- https://github.com/inikdom/neural-chatbot

DATA BOT BOX



bitfusion

# More on Deep Learning

- https://deeplearning4j.org/lstm.html
- Lowe et. Al. 'The Ubuntu Dialogue Corpus: A Large Dataset for Research in Unstructured Multi-Turn Dialogue Systems'
- Uthus, DC and Aha, DW (2013) The Ubuntu Chat Corpus for Multiparticipant Chat Analysis
- Download the Corpus: http://daviduthus.org/UCC/
- Other tensorflow chatbots:
- https://github.com/llSourcell/tensorflow_chatbot
- https://github.com/Conchylicultor/DeepQA#web-interface
- Facebook chatbot: https://youtu.be/t5qgjJIBy9g
- Google chatbot: https://youtu.be/SJDEOWLHYVo
- Cognition and memory models: http://byuipt.net/564/2013/08/23/cognition-sensory-memory/
- http://neuralconvo.huggingface.co/

DATA BOT BOX



bitfusion