

# Artificial Intelligence and Deep Learning

- [JIRAs](#)
- [Design/Theory Preparation](#)
- [Installing Tensorflow](#)
- [AlaaS](#)
  - [Open Source](#)
    - [Acumos](#)
      - [Docker architecture](#)
  - [Commercial](#)

Developers should be prepared to integrate with and use their deep learning portfolio. Before we get some scope on their API's and endpoints some background in deep learning (a specialized subset of machine learning concentrated on the "**Greedy Layer-Wise Unsupervised Pretraining procedure**" - [Hinton, 2006 - University of Toronto](#)) and the "**Long Short-Term Memory model**" - [Hochreiter and Schmidhuber 1997](#)" will be required.

## JIRAs

[LOG-500](#) - Getting issue details...

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[LOG-511](#) - Getting issue details...

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[LOG-104](#) - Getting issue details...

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## Design/Theory Preparation

Get the following Nov 2016 MIT book from [Amazon](#) by Ian Goodfellow, Yoshua Bengio, Aaron Courville - (one for work, and one for home - as it is usually out of stock). Review your linear transformation and matrix math to prep.

[https://www.amazon.ca/Deep-Learning-Ian-Goodfellow/dp/0262035618/ref=sr\\_1\\_1?ie=UTF8&qid=1486501444&sr=8-1&keywords=deep+learning](https://www.amazon.ca/Deep-Learning-Ian-Goodfellow/dp/0262035618/ref=sr_1_1?ie=UTF8&qid=1486501444&sr=8-1&keywords=deep+learning)

<https://developers.google.com/machine-learning/crash-course/>

## Installing Tensorflow

follow/verify via [https://www.tensorflow.org/install/install\\_mac](https://www.tensorflow.org/install/install_mac)

```

obrien:obrienlabs amdocs$ docker run -it tensorflow/tensorflow bash
Unable to find image 'tensorflow/tensorflow:latest' locally
latest: Pulling from tensorflow/tensorflow
22dc81ace0ea: Pull complete
1a8b3c87dba3: Pull complete
91390alc435a: Pull complete
07844b14977e: Pull complete
b78396653dae: Pull complete
22bb9efa20f2: Pull complete
e385adcc1f05: Pull complete
da0eaa434771: Pull complete
f3ad8e6a231d: Pull complete
1da6064a2568: Pull complete
e701d2aeb76d: Pull complete
cba62e3f7418: Pull complete
3b523741fd2e: Pull complete
Digest: sha256:f3b5484e3335d2eb72940a6addde6f714173ff46c8a13c06aaf10915e96bc539
Status: Downloaded newer image for tensorflow/tensorflow:latest
root@4c49aac50cel:/notebooks# python
Python 2.7.12 (default, Dec  4 2017, 14:50:18)
[GCC 5.4.0 20160609] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>> import tensorflow as tf
/usr/local/lib/python2.7/dist-packages/h5py/__init__.py:36: FutureWarning: Conversion of the second argument of
issubdtype from `float` to `np.floating` is deprecated. In future, it will be treated as `np.float64 == np.dtype
(float).type`.
  from ._conv import register_converters as _register_converters
>>> hello = tf.constant('Hello, TensorFlow!')

>>> sess = tf.Session()

2018-04-22 23:57:53.221560: I tensorflow/core/platform/cpu_feature_guard.cc:140] Your CPU supports instructions
that this TensorFlow binary was not compiled to use: AVX2 FMA
>>> print(sess.run(hello))
Hello, TensorFlow!

```

## AlaaS

### Open Source

#### Acumos

<https://jenkins.acumos.org/>

<https://nexus.acumos.org/>

<https://wiki.acumos.org/display/AC/Acumos+Installation>

<http://docs.acumos.org/en/latest/>

<https://jira.acumos.org/browse/ACUMOS-849>

meetings <https://wiki.acumos.org/pages/viewpage.action?pageId=4653650>

ONAP integration with Acumos - **LOG-264** - Getting issue details... **STATUS** , **LOG-411** - Getting issue details... **STATUS** and <https://jira.acumos.org/browse/ACUMOS-900>

#### Docker architecture

```

ubuntu@ip-172-31-60-228:~$ sudo docker ps
CONTAINER ID        IMAGE                                     COMMAND
CREATED            STATUS
PORTS              NAMES
afa39db75934        kong:0.11                               "/docker-entrypoint.
hour ago Up About an hour 0.0.0.0:80->8000/tcp, 0.0.0.0:8480->8001/tcp, 0.0.0.0:443->8443/tcp, 0.0.0.0:
8443->8444/tcp      acumos_kong_1
952f648ad4cc        nexus3.acumos.org:10004/acumos-portal-fe:1.15.16 "/bin/sh -c 'cd /mav...
hour ago Up About an hour 0.0.0.0:8085->8085
/tcp               acumos_portal-fe_1
757ceefa7345        nexus3.acumos.org:10004/onboarding-app:1.22.0    "/bin/sh -c 'cd /mav...
hour ago Up About an hour 0.0.0.0:8090->8090
/tcp               acumos_onboarding-app_1
b355fa99fdc7        nexus3.acumos.org:10004/federation-gateway:1.1.2 "/bin/sh -c 'cd /mav...
hour ago Up About an hour 9011/tcp, 0.0.0.0:9084->9084
/tcp               acumos_federation-gateway_1
614b7b173da2        nexus3.acumos.org:10004/acumos-portal-be:1.15.16 "/bin/sh -c 'cd /mav...
hour ago Up About an hour 8083
/tcp               acumos_portal-be_1
e69d0230e872        nexus3.acumos.org:10004/acumos-filebeat:1.0.0    "/usr/local/bin/dock...
hour ago Up About an
hour
acumos_filebeat_1
5d317cd0f8bb        nexus3.acumos.org:10004/acumos-azure-client:1.96.0 "/bin/sh -c 'java -X...
hour ago Up About an hour 9081
/tcp               acumos_azure-client_1
d6db55627deb        nexus3.acumos.org:10004/acumos-cms-docker:1.3.2   "/bin/sh -c 'cd /mav...
hour ago Up About an hour 0.0.0.0:9080->9080
/tcp               acumos_cms_1
91b13dfcdabb9       sonatype/nexus3:3.9.0                      "sh -c ${SONATYPE_DI...
hour ago Up About an hour 0.0.0.0:8001-8003->8001-8003/tcp, 0.0.0.0:8081->8081
/tcp               acumos_nexus_1
158802c95df0        postgres:9.5                                "docker-entrypoint.s...
hour ago Up About an hour 0.0.0.0:5432->5432
/tcp               acumos_kong-database_1
f0564e008713        nexus3.acumos.org:10004/ds-compositionengine:0.0.26 "/bin/sh -c 'cd /mav...
hour ago Up About an hour 8088
/tcp               acumos_ds-
compositionengine_1
3d552ab715c6        nexus3.acumos.org:10004/validation-middleware:1.2.1 "python validation_m...
hour ago Up About an hour 9604
/tcp               acumos_validation-
middleware_1
674cb9d41af7        nexus3.acumos.org:10004/validation-engine:1.2.2   "python validation_e...
hour ago Up About an hour 9605
/tcp               acumos_validation-
engine_1
1cdc2b4843b2        nexus3.acumos.org:10004/validation-client:1.2.1   "python validation_c...
hour ago Up About an hour 9603
/tcp               acumos_validation-
client_1
6f91fb238c95        nexus3.acumos.org:10002/common-dataservice:1.14.3 "/bin/sh -c 'cd /mav...
hour ago Up About an hour 0.0.0.0:8000->8000
/tcp               acumos_common-data-svc_1

```

## TensorFlow

[https://www.tensorflow.org/install/install\\_mac](https://www.tensorflow.org/install/install_mac)

## OpenAI

<https://github.com/openai/kubernetes-ec2-autoscaler>

<https://openai.com/systems/>

<http://www.cs.toronto.edu/~fritz/absps/ncfast.pdf>

<http://people.idsia.ch/~juergen/lstm2003tutorial.pdf>

<http://dl.acm.org/citation.cfm?id=1246450&CFID=898083621&CFTOKEN=58541063&qualifier=LU1039002>

<https://deeplearning4j.org/devguide>

## Commercial

<https://aws.amazon.com/machine-learning/amis/>

[https://aws.amazon.com/mxnet/?&trk=ha\\_a131L000005CvfAQAS&sc\\_ichannel=ha&sc\\_icampaign=pac\\_q4\\_site\\_merch\\_sign-in\\_deep\\_learning&sc\\_ioutcome=Product\\_Adoption\\_Campaigns&sc\\_iplace=SignInPage](https://aws.amazon.com/mxnet/?&trk=ha_a131L000005CvfAQAS&sc_ichannel=ha&sc_icampaign=pac_q4_site_merch_sign-in_deep_learning&sc_ioutcome=Product_Adoption_Campaigns&sc_iplace=SignInPage)

<https://www.microsoft.com/cognitive-services/en-us/sign-up>

<https://deepfield.com/cloud-genome/>