

ECBM E4040

Neural Networks and Deep Learning

Introduction to Computing Resources

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Key Course Sites

- 2019: <https://courseworks2.columbia.edu/courses/85261>
- Webpage with instructions <https://ecbm4040.bitbucket.io/>
- Google drive
<https://drive.google.com/drive/folders/1y3b9Wk7dSHH5t0V9rrxjGrJ2l9Rg-O1e>

Deep Learning

Deep Learning Tools, Software, Platforms

Deep Learning Frameworks and tools

- Google TensorFlow (<https://www.tensorflow.org/>)
- PyTorch (<http://pytorch.org/>)
- Keras (<https://keras.io/>)
- cuDNN (<https://developer.nvidia.com/cudnn>)
- ...
- Torch (<http://torch.ch/>)
- Theano (<http://deeplearning.net/software/theano/>)
- Lasagne (<http://lasagne.readthedocs.io/en/latest/index.html>)
- Caffee (<http://caffe.berkeleyvision.org/>)
- ...

Tools

TensorFlow Framework

An open-source **software library** for Machine Intelligence

- for **numerical computation** using data flow graphs.
- **Nodes** in the graph represent mathematical operations, while the **graph edges** represent the multidimensional data arrays (tensors) communicated between them.
- The flexible architecture allows you to deploy computation to **one or more CPUs or GPUs** in a desktop, server, or mobile device with a single API.
- Major changes in TF2.0: eager execution, keras, “pythonic behavior”
- <https://www.tensorflow.org/>

Tools

(Python) Jupyter Notebook

- The Jupyter Notebook is an open-source **web application** that allows you to **create and share documents**
- that contain **live code, equations, visualizations and explanatory text.**
- Uses include: data cleaning and transformation, numerical simulation, statistical modeling, machine learning and much more.
- <http://jupyter.org/>

Tools -Google Cloud - <https://console.cloud.google.com/home/dashboard>

The screenshot displays the Google Cloud Platform (GCP) dashboard. At the top, a blue header bar contains the 'Google Cloud Platform' logo, a dropdown menu for the project 'dltest', a search bar, and several utility icons (notifications, help, etc.). Below the header, the dashboard is organized into a grid of widgets. On the left, a vertical sidebar lists navigation options: Home, Pins, Cloud Launcher, Billing, APIs & services, Support, IAM & admin, and sections for COMPUTE (App Engine, Compute Engine, Container Engine, Cloud Functions) and STORAGE (Bigtable). The main content area is divided into two tabs: 'DASHBOARD' (selected) and 'ACTIVITY'. The 'DASHBOARD' tab shows several widgets: 'Project info' (Project name: dltest, Project ID: dltest-167717, Project number: 321764030731), 'App Engine' (Summary: count/sec), 'Compute Engine' (CPU %), 'SQL' (Storage used: bytes), 'Google Cloud Platform status' (All services normal), 'Billing' (Estimated charges: \$0.00), 'Error Reporting', and 'News'. Many of these widgets display a message: 'You do not have permission to see this information'. Navigation links are provided for each widget to access their respective dashboards. A 'CUSTOMIZE' link is located in the top right corner of the dashboard area.

Google Cloud Platform dltest

Home

Pins appear here

Cloud Launcher

Billing

APIs & services

Support

IAM & admin

COMPUTE

App Engine

Compute Engine

Container Engine

Cloud Functions

STORAGE

Bigtable

DASHBOARD ACTIVITY

CUSTOMIZE

Project info

Project name
dltest

Project ID
dltest-167717

Project number
321764030731

Go to project settings

App Engine

Summary (count/sec)

You do not have permission to see this information

Go to the App Engine dashboard

Compute Engine

CPU (%)

You do not have permission to see this information

Go to the Compute Engine dashboard

SQL

Storage used (bytes)

You do not have permission to see this information

Go to the SQL dashboard

Google Cloud Platform status

All services normal

Go to Cloud status dashboard

Billing

Estimated charges
For the billing period Sep 1 – 4, 2017

\$0.00

View detailed charges

Error Reporting

You do not have permission to see this information

News

Building .NET apps in Visual Studio for GCP: better than ever
3 days ago

Cloud Identity-Aware Proxy: a simple and more secure

Tools

Laptop Execution

TensorFlow

- <https://www.tensorflow.org/install/>

Tools

Git: Github (or Bitbucket)

Github/Bitbucket: Source code control, assignment distribution and collection

- <https://bitbucket.org/product>, <https://guides.github.com/>
- Server side
- Client side (options: command line, GitKraken, SourceTree, ...)

Course-related:

- <https://ecbm4040.bitbucket.io/> for web pages
- assignments distributed through courseworks, or through Github Classroom (2019)

Tools

Google (Lion) Drive: docs, sheets, slides

- see syllabus

Tools

Courseworks, Piazza and Zoom

Courseworks:

- 2019: <https://courseworks2.columbia.edu/courses/85261>
- 2018 - <https://courseworks2.columbia.edu/courses/61441>
- 2017: <https://courseworks2.columbia.edu/courses/39486>

Piazza:

2019 - <https://piazza.com/class/jzvkkbkmfny2el>

Zoom (webinars): To be created as needed

Backup Slides

Various