# Demystifying Artificial Intelligence Sorcery

## (Part 3: Deep Learning)[a]

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[a]Available @ https://github.com/a-mhamdi/isetbz/

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# Roadmap

1. An overview
2. CNN
3. VAE
4. Quizzes

# An overview

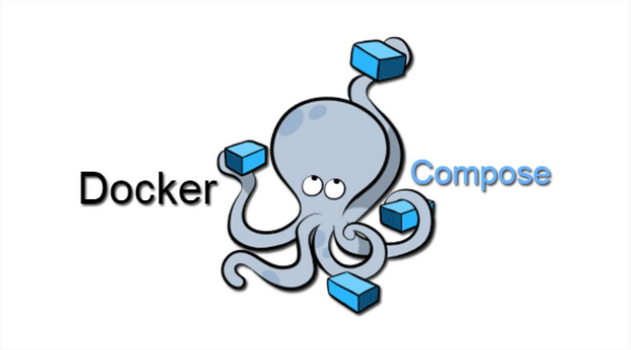

REMINDER

# Programming Language

julialang.org/

# Development Environments





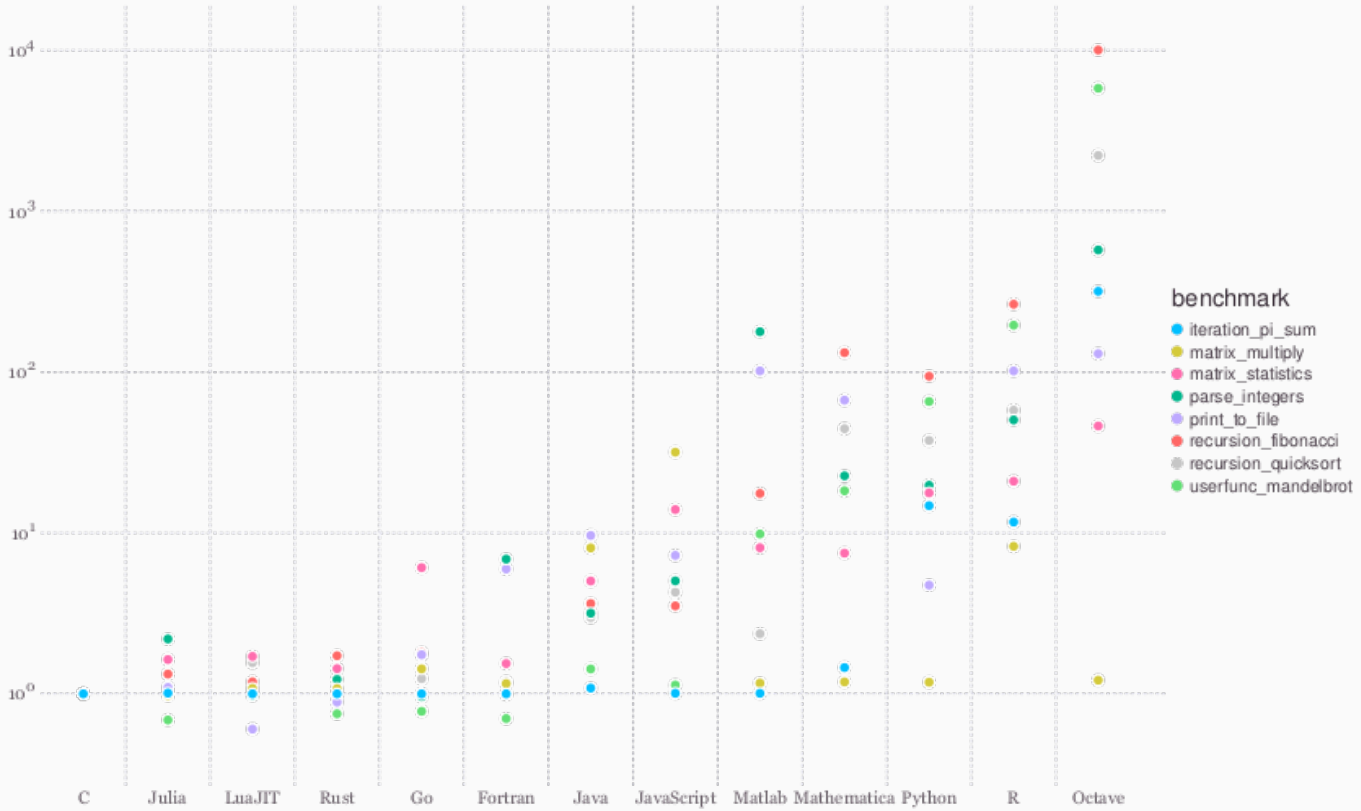

- ▲ $ docker compose up
- ▼ $ docker compose down



# Julia in a Nutshell

- Fast
- Dynamic
- Reproducible
- Composable
- General
- Open Source

# Julia Micro-Benchmarks (1/2)



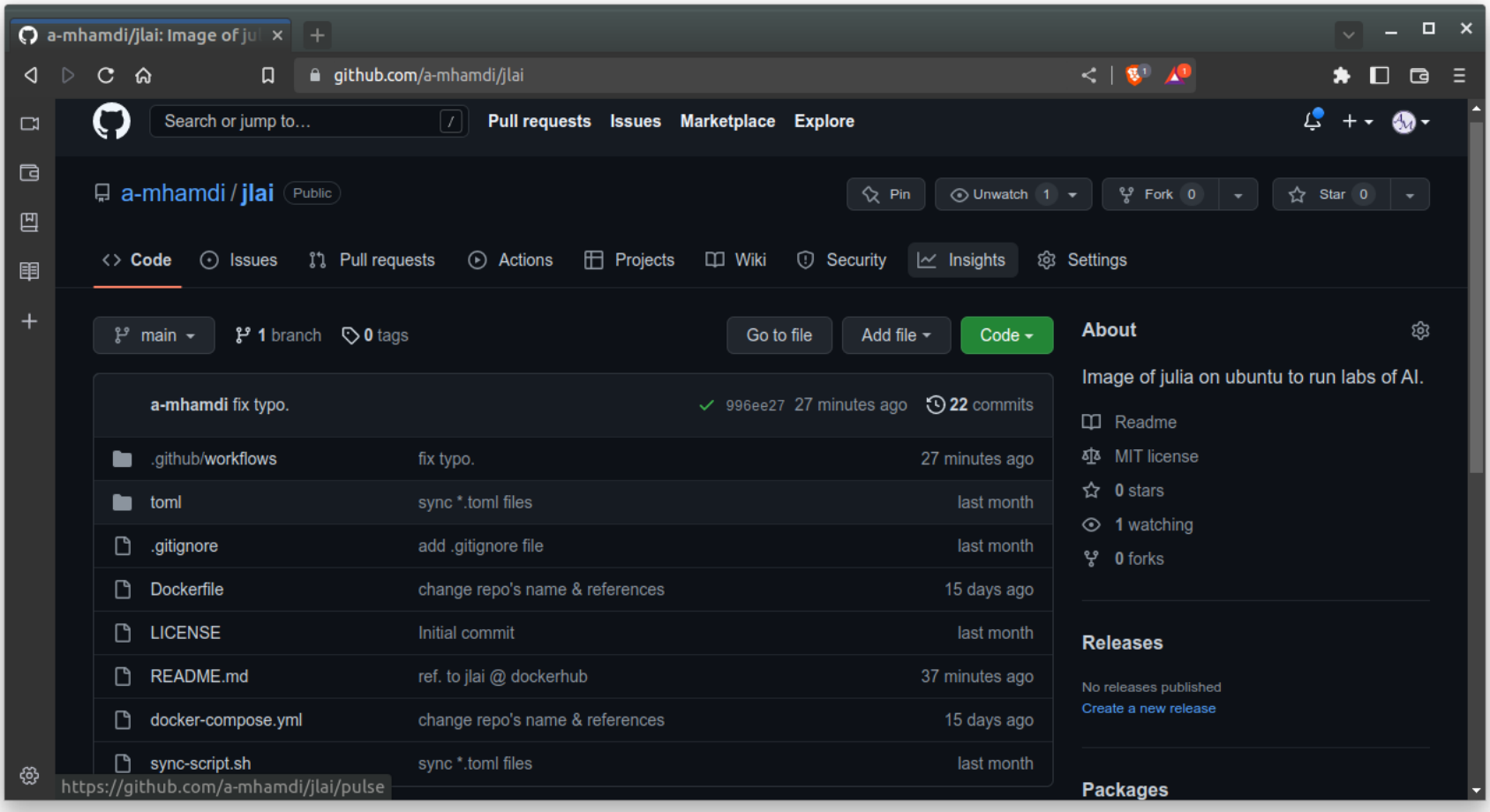

https://julialang.org/benchmarks

# Julia Micro-Benchmarks (2/2)

**Geometric Means of Micro-Benchmarks by Language**

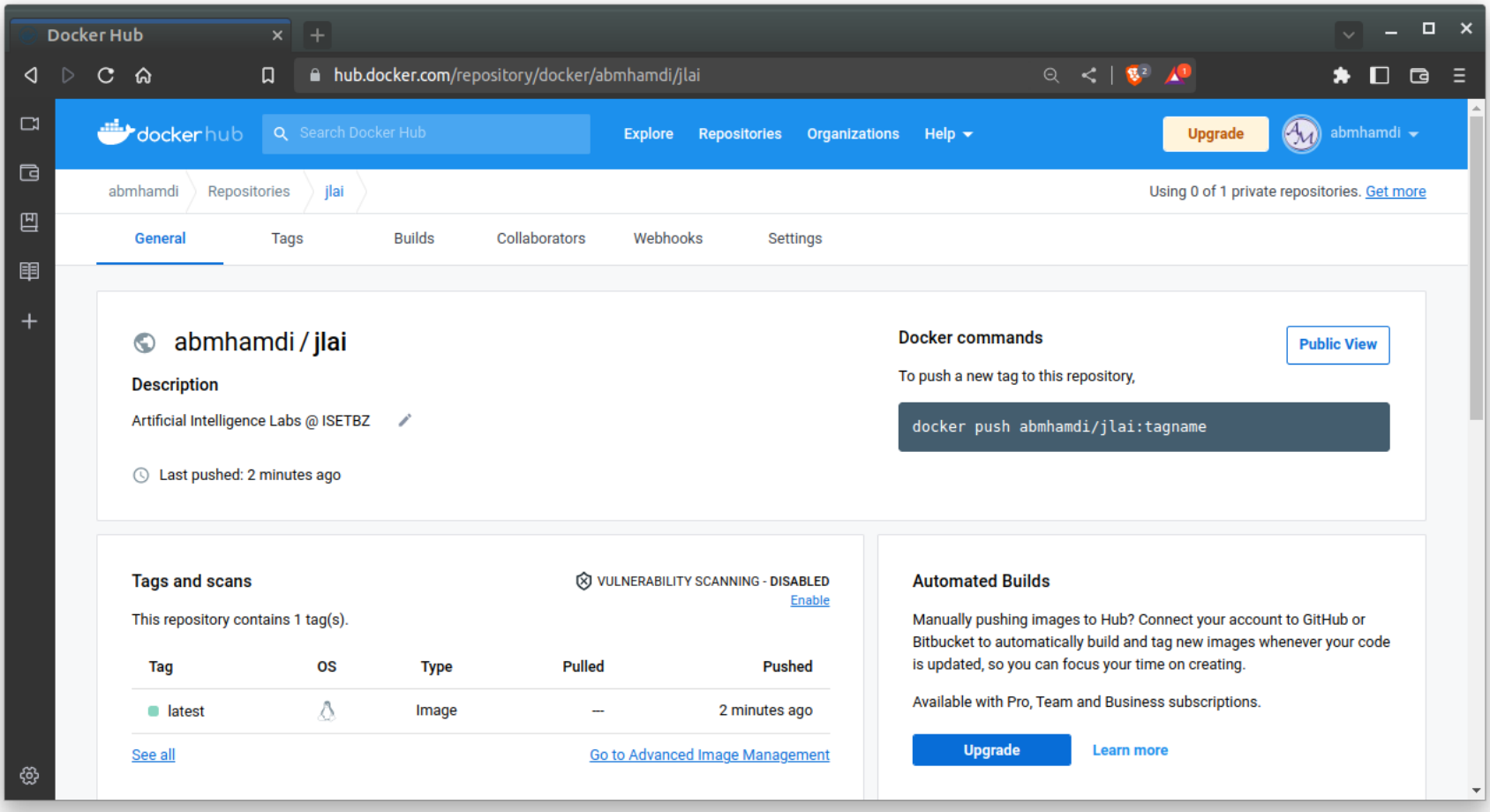
| | | |
|---|---|---|
| 1 | C | 1.0 |
| 2 | Julia | 1.17006 |
| 3 | LuaJIT | 1.02931 |
| 4 | Rust | 1.0999 |
| 5 | Go | 1.49917 |
| 6 | Fortran | 1.67022 |
| 7 | Java | 3.46773 |
| 8 | JavaScript | 4.79602 |
| 9 | Matlab | 9.57235 |
| 10 | Mathematica | 14.6387 |
| 11 | Python | 16.9262 |
| 12 | R | 48.5796 |
| 13 | Octave | 338.704 |

# Source Control Management (SCM)




https://github.com/a-mhamdi/jlai

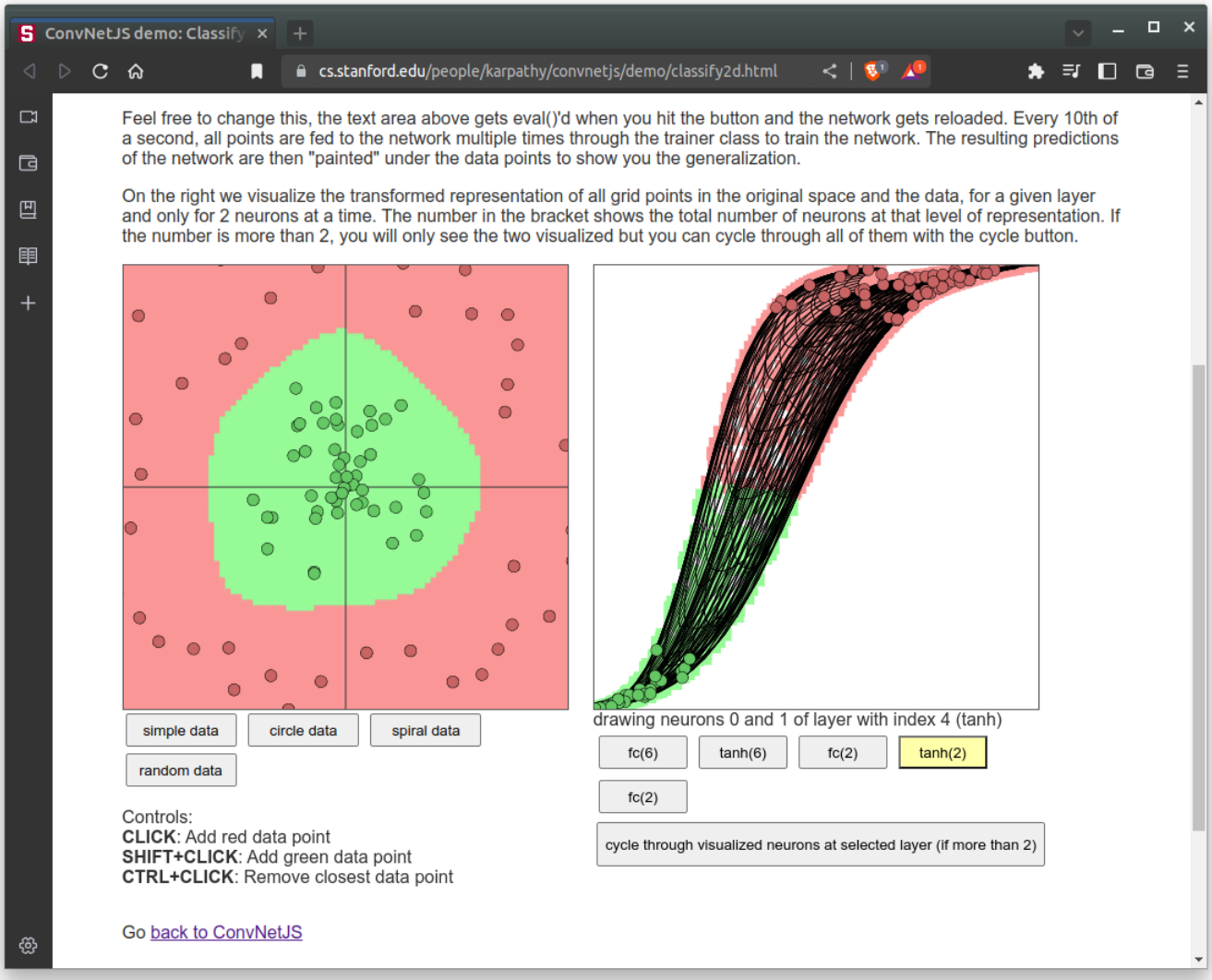
# Continuous Integration (CI)




https://hub.docker.com/r/abmhamdi/jlai

# CNN

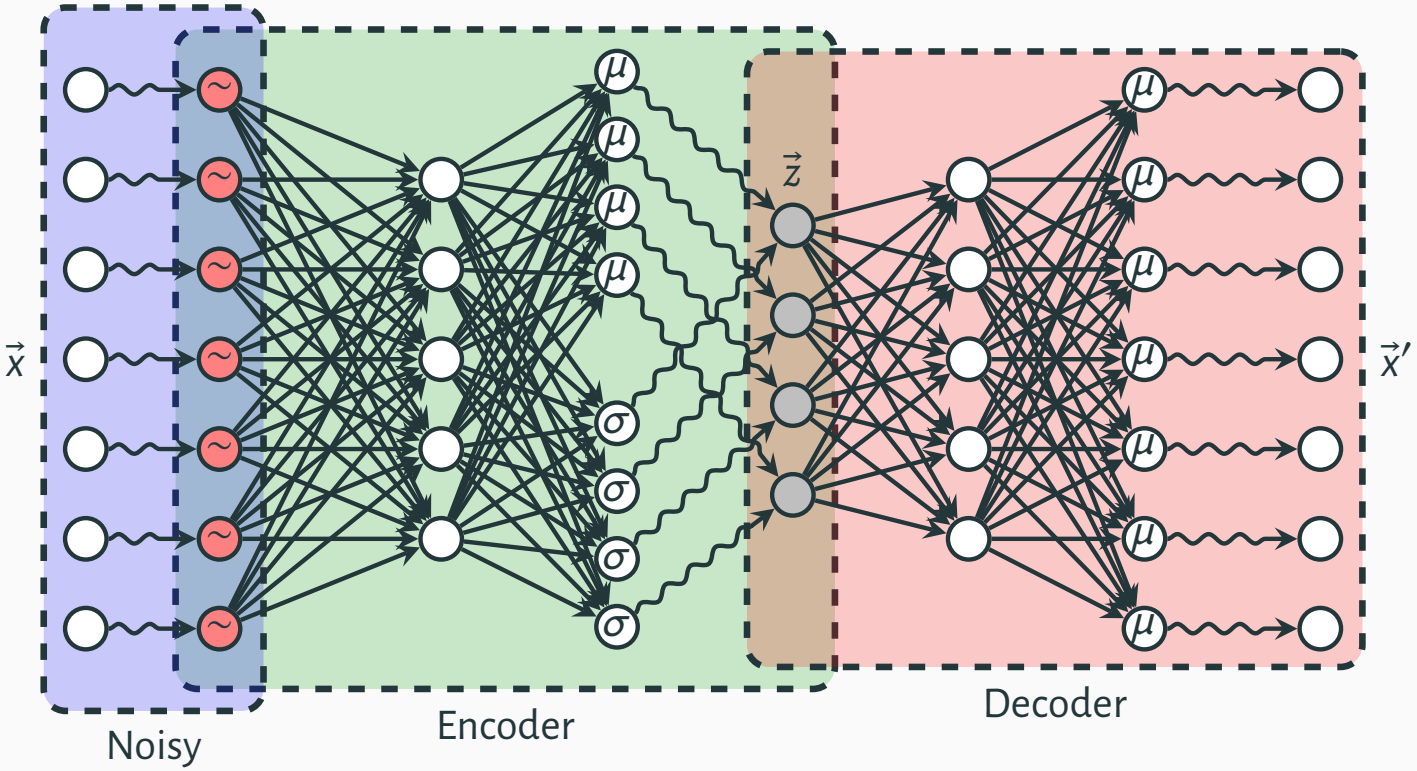
# ConvnetJS Demo




https://cs.stanford.edu/people/karpathy/convnetjs/demo/classify2d.html

# VAE

# Variational Auto-Encoder



# Quizzes

# MCQ (1/1)

1. Your supervisor asks you to create a machine learning system that will help your human resources department classify jobs applicants into well-defined groups. What type of system are you more likely to recommend?
   - × an unsupervised machine learning system that clusters together the best candidates.
   - × you would not recommend a machine learning system for this type of project.
   - × a deep learning artificial neural network that relies on petabytes of employment data.
   - ✓ a supervised machine learning system that classifies applicants into existing groups.
2. Your data science team must build a binary classifier, and the number one criterion is the fastest possible scoring at deployment. It may even be deployed in real time. Which technique will produce a model that will likely be fastest for the deployment team use to new cases?
   - × random forest
   - ✓ logistic regression
   - × KNN
   - × deep neural network
3. The famous data scientist Andrew Ng has been quoted as saying, "Applied machine learning is basically feature engineering." What is feature engineering?
   - × scraping new features from web data
   - ✓ creating new variables by combining and modifying the original variables
   - × designing innovative new user features to add to software
   - × using deep learning to find features in the data

# Some Useful Links

1. https://setosa.io/ev/
2. https://karpathy.ai/
3. http://yann.lecun.com/
4. https://www.hackingnote.com/
5. https://stanford.edu/ shervine/teaching/
6. https://machinelearningmastery.com/
7. https://www.ibm.com/downloads/cas/GB8ZMQZ3
8. https://colah.github.io/posts/2014-03-NN-Manifolds-Topology/

# Further Reading (1/1)