

# Machine Learning in Go

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What is Machine  
Learning?

What Golang  
Machine Learning  
Tools are there?

# What in Machine Learning?

- Artificial Intelligence
- Natural Language Processing
- Supervised Learning
- Unsupervised Learning
- Deep Learning

# AI

“the field of computer science dedicated to solving cognitive problems commonly associated with human intelligence, such as learning, problem solving, and pattern recognition.” - Amazon

- Farming
- E-mail
- Medical
- Gaming
- Enterprise
- Cyber-Security
- Housing
- Networking
- Non-profit

# NLP

- Study of how computers interact with natural language.
- Text converted to mathematical vector representation.
- Translation
- Predict text
- Sentiment analysis

# NLP - Tools

Word to Vec - [Sajari Word2Vec](#)

Work stemming [Sajari Go-Stem](#)

Word Vector Distances [Xrash smetrics](#)

# NLP - Example

Go-vectorDistance

# Supervised Learning

- Learning an algorithm from a labeled data set
- Spam Classifier



# Supervised Learning - Tools

- Linear REgression
  - [Sajari](#)
- Decision Trees
  - Random Forests
  - <https://github.com/sajari/random-forest>
  - <https://github.com/barnjamin/randomforest>
- SVM
  - <https://github.com/datastream/libsvm>
- Bayesian
  - <https://github.com/jbrukh/bayesian>

# Supervised Learning - Example

[go-ml-linear-regression](#)

# Unsupervised Learning

- Discovering patterns and trends in data without a desired pattern
- Clustering, Classification, Pattern Discovery

# Unsupervised Learning - Tools

- SVM
- KNN
  - [Sjwitworth](#)
  - <https://github.com/shuLhan/go-mining>

# Unsupervised Learning - Example

KNN Golang

# Deep Learning

- Using a neural network pattern to train a model using multiple parameter
- CNN
- RNN
- Reinforcement Learning
- Feed forward Network
- Gans

# Deep Learning - Tools

- RNN
- CNN
  - Gorgonia
- Tensorflow
  - Golang tensorflow wrappers for deployed python models

# Deep Learning - Example

<https://speakerdeck.com/owulveryck/onnx-go-neural-networks-made-easy>

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# Tools for Productivity - Concurrency

- Go Routines
- Go Channels
- Data types
- Api
- Binary Deploy

# Tools for Productivity - Tensorflow



Posted by u/loganjspears 1 year ago

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## Tensorflow Support for Go

Anyone have experience using tensorflow in go? Is it still being worked on? I would hate to have to resort to using Python...



18 Comments



Give Award



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Save

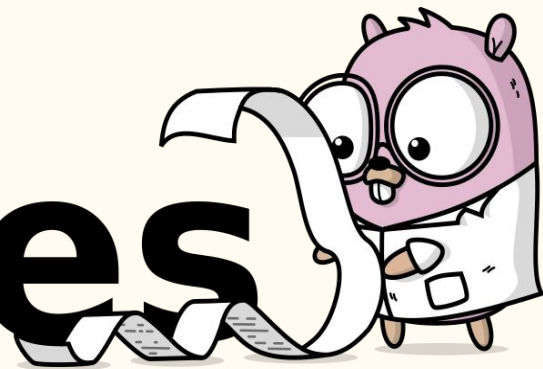
- Use python models in your go app
- [Tensorflow Go API](#)
- [Tensorflow github](#)
- [Tensorflow wrapper](#)

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# Tools for Productivity - JupyterNotebooks

- [Jupyter](#)
- [Gophernotes](#)
- [Mybinder Go support](#)

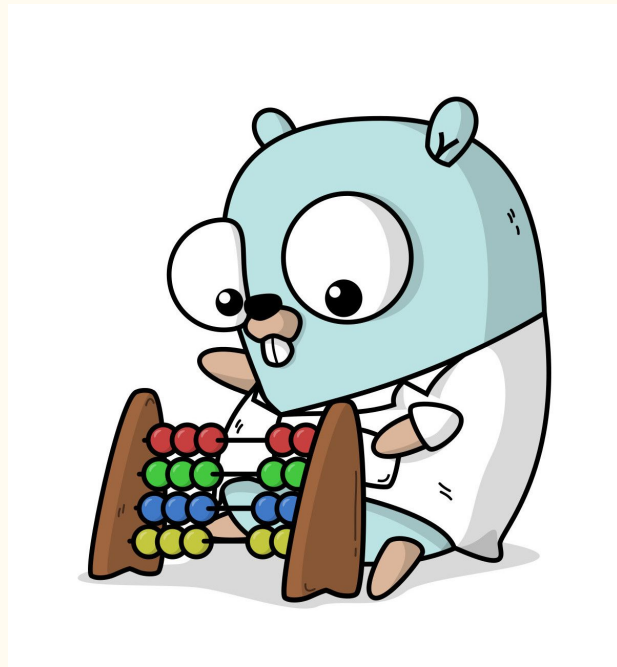
# gophernotes



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# Tools for Productivity - Math libraries

- [Gonum](#)
- [Gonum-plot](#)
- [Go-hep](#)



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# Tools for Productivity - Deployment

- [Docker images](#)
- [Pachyderm](#)
- [Kubeflow](#)

# Room To Grow - Standardization

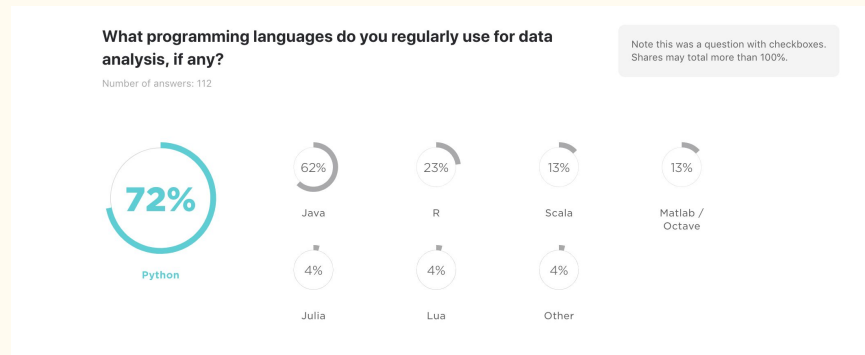
- Pandas, numpy, scipy, matplotlib
- Pytorch, tensorflow, sci-kit learn

## In Go

- Individual projects
- Divided community
- Lack of support

# Room To Grow - Transfer Learning

- Transfer Learning = building of off open-sourced trained models
- Lack of published models
- Ground-breaking work done in Python, R, Java
- Starting from scratch in Go



<https://www.jetbrains.com/research/data-science-2018/>

# Room To Grow - Community Support

- I CAN NAME AND COUNT ON ONE HAND THE NUMBER OF PEOPLE CONTRIBUTING TO GOLANG ML OPENSOURCE!
- WE WANT YOU



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# Additional Resources

Definitions

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# Questions?

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