Exploring Word2vec in Scala

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PHASE

FindLectures.com : A case study on natural language search

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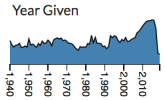
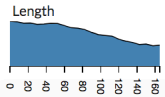
Year Given



Length



Prison Reform: Alternatives to Mass Incarceration with Steven Raphael (29 minutes)

Ian Bostridge and Jeremy Denk on Winterreise: Anatomy of an Obsession (60 minutes)

Re-seeing the Unseen - Advances in Ophthalmology (15 minutes)

Slavery, Ships and Sickness
Speaker: Professor Stuart Anderson
Given On: Monday, 24 October 2011, 1:00PM

The Goat Rodeo Sessions (Yo-Yo Ma, Stuart Duncan, Edgar Meyer, Chris Thile) | Musicians At Google (34 minutes)

Is the world flat?
Speaker: Christopher Dye
Given On: Thursday, 25 October 2007, 12:00AM

Karen E. Willcox (58 minutes)

Eva Kor: "Surviving the Angel of Death: The True Story of a Mengele Twin in Auschwitz" (69 minutes)
Speaker: Eva Kor

Thomas L Magnanti (2.2 hours)

Qualcomm Thinkabit Lab Presents: Programming Servos (12 minutes)

Brad Bell and Jane Espenson - Inventing Television: How Husbands Fully Realizes the Promise (41 minutes)

Chris Kimball: "The Science of Good Cooking" | Talks at Google (54 minutes)
Speaker: Chris Kimball

Handling Emotion (4 minutes)

Ethiopia 1969 Reel 5 of 65 (17 minutes)

ECO12 Berlin: Bernard Scherrer EDF Open Innovation (19 minutes)

ENGL 3322 LECTURE 11 (56 minutes)

Part 2 - The David and Lyn Silfen University Forum, 2012 (16 minutes)

Denkfest: Pro Homeopathy? (36 minutes)
Speaker: Edzard Ernst

What Can 'Friends of Syria' Do to Help Halt Killings? (10 minutes)

Dan Buettner: How to live to be 100+ (22 minutes)
Given On: February 06, 2010

1 2 3 4 5 6 7 8 9 10 ›

1 to 20 of 200,212 lectures (~130,000 hours)

Weekly Emails

FREE TALK LIST

Want to learn something new? Sign up for our Monday morning list - an eclectic combination of our 3-5 videos and articles.

Email:

Sign me up!

Goals

- Using machine learning on text
- Practical examples of Word2Vec in Scala
- Show uses of CUDA

Agenda

- Proof of Concept: Email alerts
- Concept Search
- CUDA

Papers

An empirical study of semantic similarity in WordNet and Word2Vec
http://scholarworks.uno.edu/cgi/viewcontent.cgi?article=3003&context=td

A Dual Embedding Space Model for Document Ranking
https://arxiv.org/pdf/1602.01137v1.pdf

FindLectures.com Topic Alert

Keywords: scala

The following talks and articles were selected just for you:

Articles

Roadmap towards non-experimental macros

Getting Into Other People's Code

Configure Jupyter Notebook on Raspberry PI 2 for remote access and scala kernel install – log-IT.ro

Finatra Tutorial: Building Scalable Services The Twitter Way

Play 2.6.6 with sbt 1.0 support

Contest: scala-lang.org frontpage code snippet

Reactive Streams in Scala meet a Game Engine: part 6 - modularising the game logic

Videos

5 Bullets to Scala Adoption (Tomer Gabel, Israel) (50 minutes)

Polyglot Programming with Python: Python/Scala Interop (37 minutes)

Scala Collections: Why Not? (46 minutes)

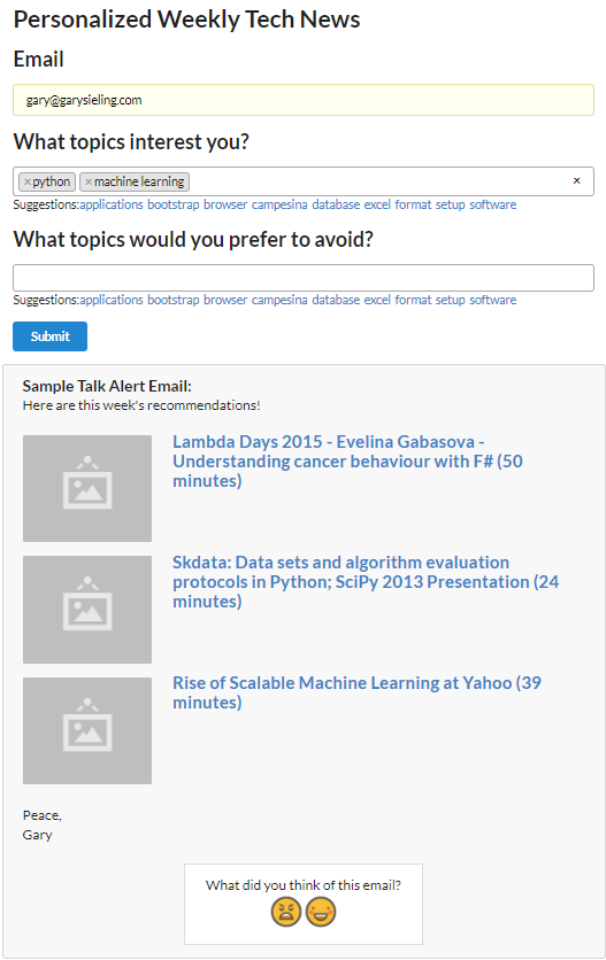
This alert was generated by Gary Sieling using FindLectures.com.

What did you think of this email?

Peace,
Gary

P.S. You can report issues with these emails on Github!

Email Alerts



Concept Search

- Writing, NOT Code
- Excludes “writing css”, “writing php”
- Implies "poetry", "fiction", “copyediting”

Concept Search

- Recipes, Vegetarian Food
- NOT Dairy
- All three might include "vegan cooking"
- Implies no milk, cheese

Requirements

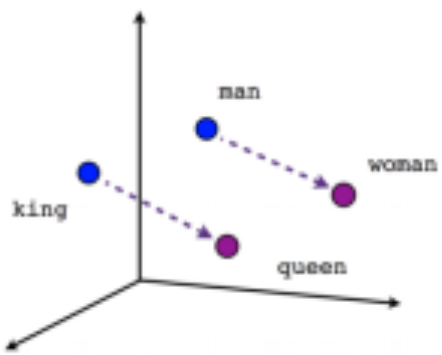
- Talks ”about” the chosen topic
- Incorporate meaning – “Scala” + “Machine Learning” -> Dl4j
  - May be a concept hierarchy
- Don’t combine meaning if nothing in common (hiking, art)
- Don’t send duplicate talks/articles (e.g. announcement from different publications)
- Choose a wide variety of talks (not 5 on type systems, etc)
- Bonus points for “negative” meanings (scala, but not monads)

This is ”search” problem

- Tokenize text
- Maybe mark known “entities”
- Filter / de-emphasize common terms / meanings
- Find the terms we should have searched for
- Search for those terms
- Re-rank / filter results

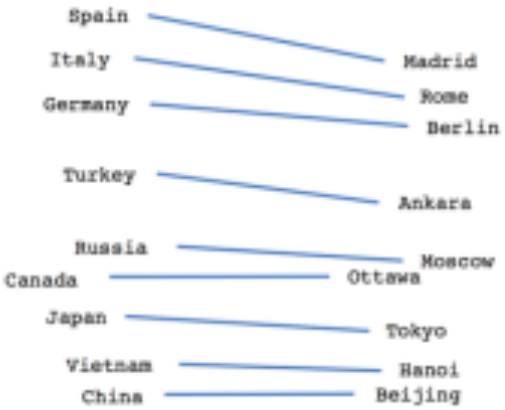
Solution: Word2Vec

https://github.com/idio/wiki2vec



Male-Female

Verb tense



Country-Capital

Terms in context: Political Coding

http://findlectures.com/?q=liberation

Faith in a Post-Modern World ▶
Description: about political *liberation*? How can Christian faith be interpreted in a scientific and pluralist age?

Henry Johnson comments on significance of the 1972 African Liberation Day March
Description: of the African *Liberation* Day March in Washington, 1972, and on-going significance of the march. Overall

HIST 3322 LECTURE 6A (1.3 hours)
Captions (00:08:31) bit about the National *Liberation* Front

Queer Studies Lecture Series - February 27, 2017 - Emily K. Hobson (48 minutes)
Captions (00:03:07) defined sexual *liberation* and radical

GDL Primetime: Data Liberation (27 minutes)
Captions (00:06:53) Liberation and the Data *Liberation* Front all the way

"Whale Wars" Ship a Terror Group? (2 minutes)
Captions (00:00:18) the Animal *Liberation* Front alf

WORLD WAR II LIBERATION OF PARIS 1944 COMBAT DOCUMENTARY 78174 (13 minutes)
Description: in 1944. The *Liberation* of Paris (also known as the Battle for Paris) was a military conflict that took

Paulo Freire & George Stoney Church Conversation (15 minutes)
Description: in 1996, Stoney and Freire discuss *Liberation* Theology, tolerance, large questions of life, and Freire's

Terms in context: Context definitions

http://findlectures.com/?q=quaker

This Separation Forced upon Us: Philadelphia's Free Quakers and the Culture of Revolution (59 minutes)
Description: Despite their history of pacifism, Philadelphia *Quakers* were deeply entangled in the American

Quakers Living Adventurously: The Library and Archives of the Society of Friends ▶
Description: Since the seventeenth century, members of the Religious Society of Friends - also known as *Quakers*

Anthony Benezet, Father of Atlantic Abolitionism (60 minutes)
Description: to convince his *Quaker* brethren that slave-owning was not consistent with Christian doctrine. Benezet and his

The Life of Herbert Hoover: Fighting Quaker 1928-1933 (52 minutes)
Captions (00:21:15) economically than most of the Western world. The first *Quaker* president, the first born

2016 Stephen G. Cary Lecture (1.5 hours)
Captions (01:24:39) which I understood *Quaker*

David Holmes - Religion and Watergate - 03/17/15 (60 minutes)
Captions (00:06:28) was raised a *Quaker*

Book TV at UCLA: Lane Hirabayashi, "A Principled Stand" (10 minutes)
Captions (00:06:14) he was already a *Quaker* because he was

President Reagan's Radio Address on Tax Reforms from Camp David, Maryland on June 1, 1985 (5 minutes)
Captions (00:00:10) the *Quaker* whose patience was sorely

Philip Gulley: 2015 Stephen G. Cary Memorial Lecture (1.4 hours)
Description: *Quaker* Pastor speaks about programmed and un-programmed *Quaker* meetings.

Training Vectors

Was raised a Quaker
[”was”, “raised”, ”a”, “religious”, “since”, “the”, “whose”, “patience”]
[1, 1, 1, 0, 0, 0, 0, 0]

The Quaker whose patience was
[”was”, “raised”, ”a”, “religious”, “since”, “the”, “whose”, “patience”]
[1, 0, 0, 0, 0, 1, 1, 1]

Word2Vec Output

P(Term | context)

Or

P(Context | Term)

Example: Vector Addition

Gloria Steinem - Person + Ideology ~=

1. Marxist Feminism
2. Radical Feminism
3. Feminist Movement
4. Feminist Theory

Suggested Search

Searches related to Pennsylvania:

Pennsylvania	Philadelphia, Pennsylvania
Montgomery County, Pennsylvania	York County, Pennsylvania
Bucks County, Pennsylvania	Philadelphia
Pittsburgh, Pennsylvania	Harrisburg, Pennsylvania
Berks County, Pennsylvania	Lancaster County, Pennsylvania

Searches related to Bayard Rustin:

Rustin	A. Philip Randolph
Bayard	Tom Kahn
civil-rights	Coretta Scott King
Ella Baker	A. J. Muste
Roy Wilkins	James L. Farmer, Jr.

Searches related to Stokely Carmichael:

Stokely	SNCC
Student Nonviolent Coordinating Committee	James Bevel
Malcolm X	Diane Nash
(SNCC)	Fannie Lou Hamer
Robert Parris Moses	Black Power

Searches related to Social Justice:

Social change	Social responsibility
Social equality	Teaching for social justice
Social	Social movement
Social exclusion	Social market economy
social justice	justice

Searches related to Philadelphia Eagles:

Chicago Bears	New York Giants
Carolina Panthers	Detroit Lions
New York Jets	Arizona Cardinals
New England Patriots	National Football League
Atlanta Falcons	Cincinnati Bengals

Searches related to Machine Learning:

Machine Learning	Pattern recognition
Neural network	Support vector machine
Artificial neural network	Knowledge representation
machine learning	Evolutionary computation
Subsumption	Multi-agent system

Example: Data Format


```
{
  "word":"zulus"
  "count":30,
  "syn0":[
    -0.064,0.118,0.031,0.163,0.019,0.197,0.097,-0.139,-0.055,0.155,
    -0.033,-0.252,-0.029,0.119,0.007,-0.017,0.187,0.017,0.058,-0.097,
    -0.255,-0.159,-0.053,-0.090,-0.118,0.119,0.068,0.025,0.160,-0.035,
    -0.216,0.065,0.017,0.038,-0.068,0.101,0.090,0.089,-0.023,0.265,
    -0.161,-0.178,-0.362,0.016,0.226,-0.070,-0.079,0.040,0.368,-0.150
  ],
  "syn1":[
    0.312,0.379,0.168,-0.371,-0.094,0.218,-0.022,-0.051,0.003,-0.010,
    0.233,-0.005,-0.037,0.105,0.025,-0.040,-0.127,.201,0.175,0.277,
    0.185,-0.219,-0.504,-0.187,0.069,0.041,0.237,-0.245,0.067,
    -0.186,0.127,0.235,-0.262,-0.020,-0.152,0.007,-0.346,0.008,-0.173,
    -0.267,-0.049,0.051,0.087,0.046,-0.059,0.147,0.024,0.032,-0.403,
    0.019
  ]
}
```

Example: Similarity

Number from [0, 1]

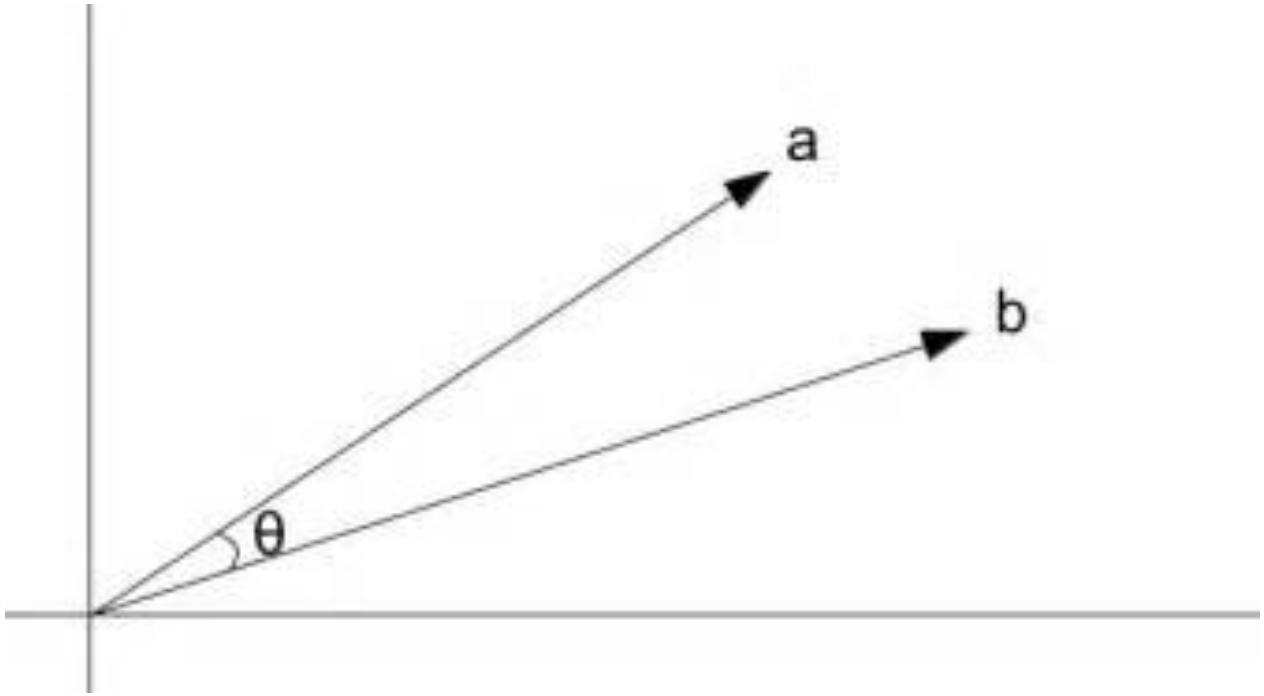


Image credit: https://engineering.aweber.com/cosine-similarity/

Operation 1: “Similarity”

```
def cosineSimilarity(
  a: INDArray,
  b: INDArray
): Double = {
  Transforms.cosineSim(a, b)
}
```

INDArray

- Similar to numpy array
- Implementation depends on dependency:

```
libraryDependencies +=
    "org.nd4j" % "nd4j-cuda-8.0-platform" % nd4jVersion

libraryDependencies +=
    "org.nd4j" % "nd4j-native" % nd4jVersion
```

CUDA

- Specialized instruction set in video cards / GPUs
- Requires NVIDIA SDK and a recent card ($100-$xx,xxx)
- Available on AWS
- Deeplearning4j: JVM libraries for machine learning
- Nd4j/nd4s: matrix algebra on large arrays

CUDA: example C code

```
__global__ void coalescedMultiply(float *a, float *c, int M)
{
        __shared__ float aTile[TILE_DIM][TILE_DIM],
        transposedTile[TILE_DIM][TILE_DIM];
        int row = blockIdx.y * blockDim.y + threadIdx.y;
        int col = blockIdx.x * blockDim.x + threadIdx.x;
        float sum = 0.0f;
        aTile[threadIdx.y][threadIdx.x] = a[row*TILE_DIM+threadIdx.x];
        transposedTile[threadIdx.x][threadIdx.y] =
                a[(blockIdx.x*blockDim.x + threadIdx.y)*TILE_DIM +
                threadIdx.x];
        __syncthreads();
        for (int i = 0; i < TILE_DIM; i++)
                sum += aTile[threadIdx.y][i]* transposedTile[i][threadIdx.x];
        c[row*M+col] = sum;
}
```

Ways to obtain GPUS

- Buying
- Renting
  - AWS ($0.90/hr)

Name	GPUs	vCPUs	RAM (GiB)	Network Bandwidth	Price/Hour*	RI Price / Hour**
p2.xlarge	1	4	61	High	$0.900	$0.425
p2.8xlarge	8	32	488	10 Gbps	$7.200	$3.400
p2.16xlarge	16	64	732	20 Gbps	$14.400	$6.800

Training Word2Vec

```
val vec =
  new Word2Vec.Builder()
    .minWordFrequency(5)
    .iterations(1)
    .layerSize(100)
    .seed(42)
    .windowSize(5)
    .iterate(sentenceIterator)
    .tokenizerFactory(tokenizer)
    .build
vec.fit();
```

How do you tell if your code is running - GPU

How does this affect word2vec

- Dl4j Demo project: 72 minutes (CPU)
- Dl4j Demo project: 41 minutes (GPU)

Most Similar

….

Definining ops we can use – should this be sooner?

Operation 2: Compute a document mean

```
def getWordVectorsMean(tokens: List[String]): INDArray = {
    val words = tokens.filter(
      model.getWordVector(_) != null
    ).sorted

   model.getWordVectorsMean(
     words.asJavaCollection
   )
}
```

Nd4s / Nd4j

- Everything is one long array, with dimensions (like numpy)
- Create one with a big iterator
- Easy to reshape
- Parallelism – min 32 cores, all following same path

Problem: Suggestions

By the next search?

Searches related to ron chernow

ron chernow **website**	ron chernow **titan**
ron chernow **contact**	ron chernow **washington**
ron chernow **grant**	ron chernow **awards**
ron chernow **alexander hamilton**	ron chernow **alexander hamilton pdf**

Problem: Noise

Personal background [edit]

Ron Chernow has received honorary degrees from Long Island University, Marymount Manhattan College, Hamilton College, Washington College, and Skidmore College.[3]

3

Nd4s – Make an array

```
val data: Seq[Double] =
    Seq(
      words.flatMap(
        (w) => wordVectors(w)
      ),
      words.flatMap(
        (w) => Seq.iterate(1, widthOfWordVector)((idx: Int) => termFrequencies(w)).map(
          (vv: Int) => vv.toDouble
        )
      ),
      words.flatMap(
        (w) => Seq.iterate(1, widthOfWordVector)((idx: Int) => documentFrequencies(w)).map(
          (vv: Int) => vv.toDouble
        )
      )
    ).flatten
```

Nd4s – Computation of TF*IDF average

```
val modeVectors = arr.reshape(modes, widthOfWordVector * numWords)
    val scores = modeVectors(0 -> 1)
    val tf = modeVectors(1 -> 2)
    val df = modeVectors(2 -> 3)

    val weighted = scores * tf / df

    val wordVects = weighted.reshape(numWords, widthOfWordVector)
    // this is the weighted everage

    wordVects.sum(0) / numWords
```

// TODO is this any better?

"Synonym" Discovery Example

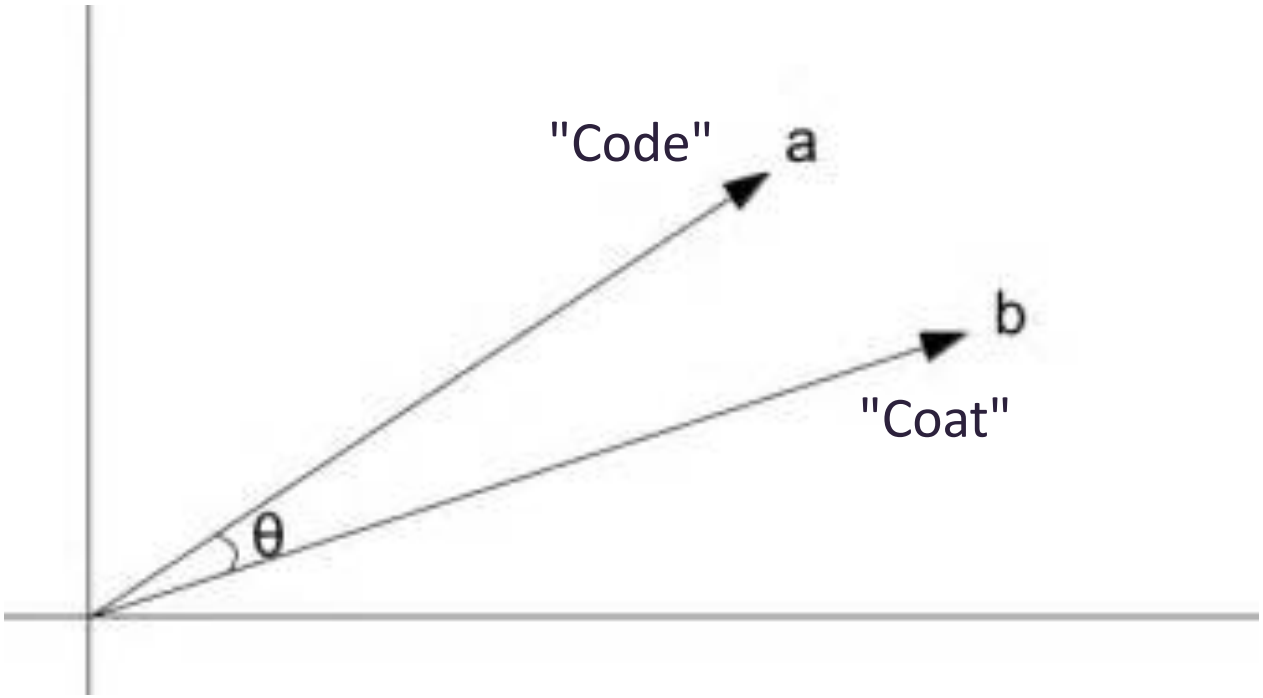


Image credit: https://engineering.aweber.com/cosine-similarity/

Word2Vec – Build a Full Text Query

```
List("python", "machine", "learning").map(
   (queryTerm) =>
    "(" +
       model.wordsNearest(
          List(queryTerm), // positive terms
          List(), // negative terms
          25
       ).map(
          (nearWord) =>
             "transcript:" + term2 +
             "^" + model.similarity(nearWord, term2)
       ).mkString(" OR ")
    + ")"
).mkString(" AND ")
```

Visual – Nearest terms

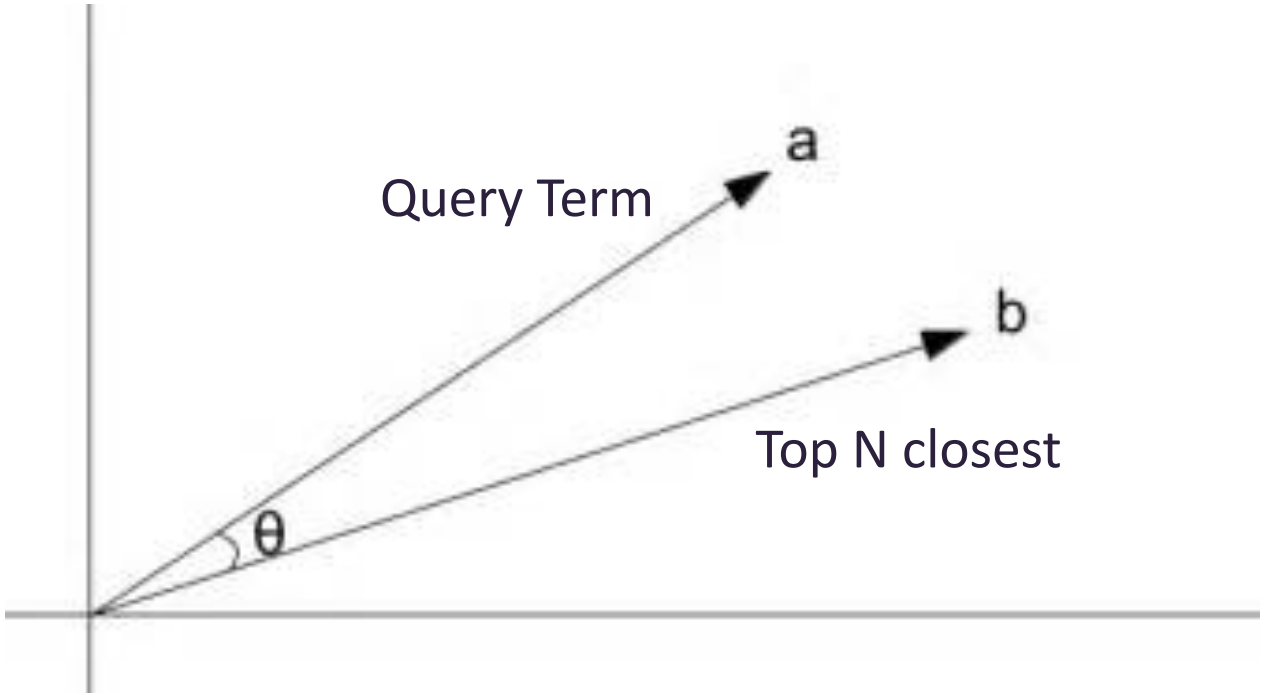


Image credit: https://engineering.aweber.com/cosine-similarity/

Example – Query (“Python + Machine Learning”)

title_s:python^10 OR title_s:"machine learning"^10 …
(title_s: software^1.21 OR title_s:database^1.20 OR title_s:format^1.18
title_s:applications^1.14 OR title_s:browser^1.14 OR title_s:setup^1.13
title_s:bootstrap^1.13 OR title_s:in-class^1.13 OR title_s:campesina^1.12 OR
title_s:excel^1.12 OR title_s:hardware^1.11 OR title_s:programming^1.11 OR
title_s:api^1.11 OR title_s:prototype^1.11 OR title_s:middleware^1.11 OR
title_s:openstreetmap^1.10 OR title_s:product^1.10 OR title_s:app^1.09 OR
title_s:hbp^1.09 OR title_s:programmers^1.09 OR title_s:application^1.09 OR
title_s:databases^1.09 OR title_s:idiomatic^1.09 OR title_s:spreadsheet^1.09
OR title_s:java^1.09 …
AND (…)

Results (Python + Machine Learning + BM25)

Python for Data Analysis
How To Get Started With Machine Learning? | Two Minute Papers
The /r/playrust Classifier: Real World Rust Data Science
Andreas Mueller - Commodity Machine Learning
A Gentle Introduction To Machine Learning
A full Machine learning pipeline in Scikit-learn vs in scala-Spark
Hello World - Machine Learning Recipes #1
Visual diagnostics for more informed machine learning
Lab to Factory: Robust Machine Learning Systems
Machine Learning with Scala on Spark by Jose Quesada

Word2Vec – “Writing”

Issues Related to the Teaching of Creative Writing
Is Nonfiction Literature?
"Oh, you liar, you storyteller": On Fibbing, Fact and Fabulation
The Value of the Essay in the 21st Century
Re writing Re reading Re thinking – Web Design in Words
Aspen New York Book Series: The Art of the Memoir
Cheryl Strayed: "Wild"
Siri Hustvedt in Conversation with Paul Auster
Mary Karr: The 2016 Diana and Simon Raab Writer-in-Residence
History, Memory, and the Novel

Aboutness

Re-sorting top 100 documents

```
val queryMean = model.getWordVectorsMean(List("writing"))
val mean = model.getWordVectorsMean(NLP.getWords(document._1))
val distance = Transforms.cosineSim(vec._2, queryMean)
```

5 min 45 seconds @ 16 parallel threads

Visual – Aboutness

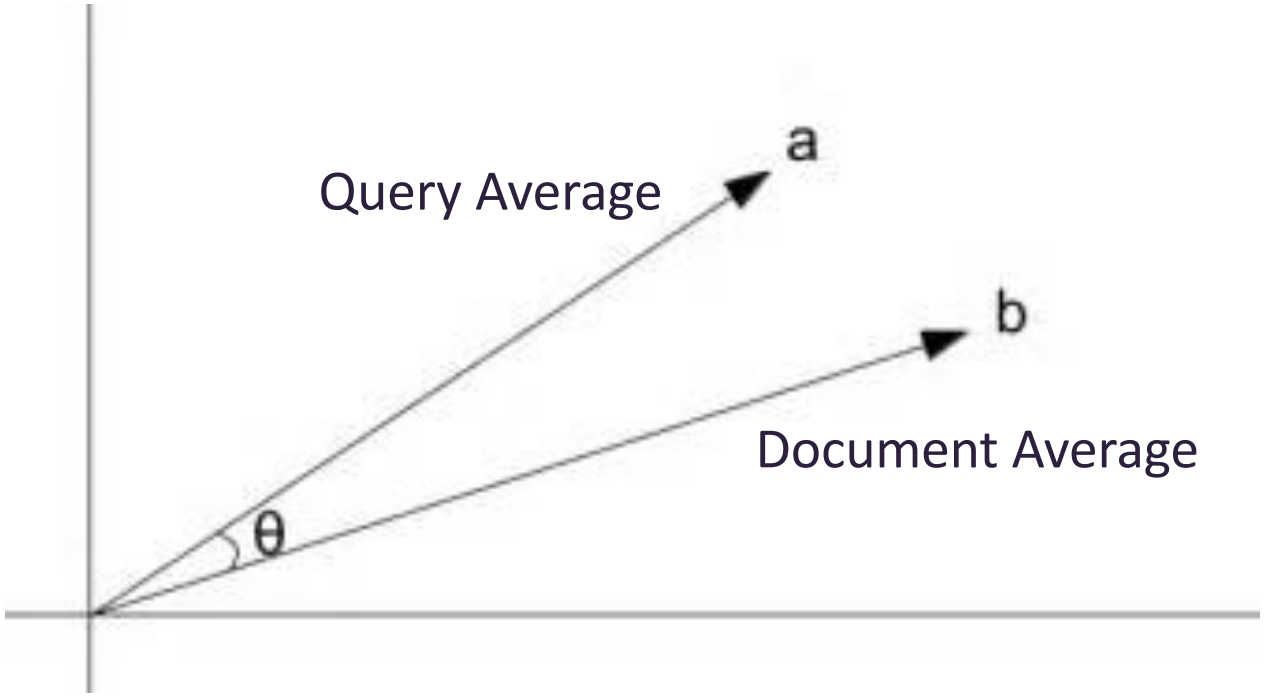


Image credit: https://engineering.aweber.com/cosine-similarity/

Aboutness - Results

Issues Related to the Teaching of Creative Writing: 0.43
Autobiography: 0.41
Contemporary Indian Writers: The Search for Creativity: 0.41
Marjorie Welish: Lecture: 0.40
History and Literature: The State of Play: A Roundtable Discussion: 0.40
Critical Reading of Great Writers: Albert Camus: 0.40
Daniel Schwarz: In Defense of Reading: 0.39
The Journey To The West by Professor Anthony C. Yu: 0.39
Blogs, Twitter, the Kindle: The Future of Reading: 0.39

Word2Vec + Overlapping Search Terms

Python, Programming vs Art, Hiking

```
terms.map(
  (term1) =>
    terms.map(
      (term2) => (term1, term2)
    )
).flatten.filter(
  (tuple) => tuple._1 < tuple._2
).map(
  (tuple) =>
    (tuple._1, tuple._2, w2v.model.get.similarity(tuple._1, tuple._2))
)
```

Visual – Overlapping Search Terms

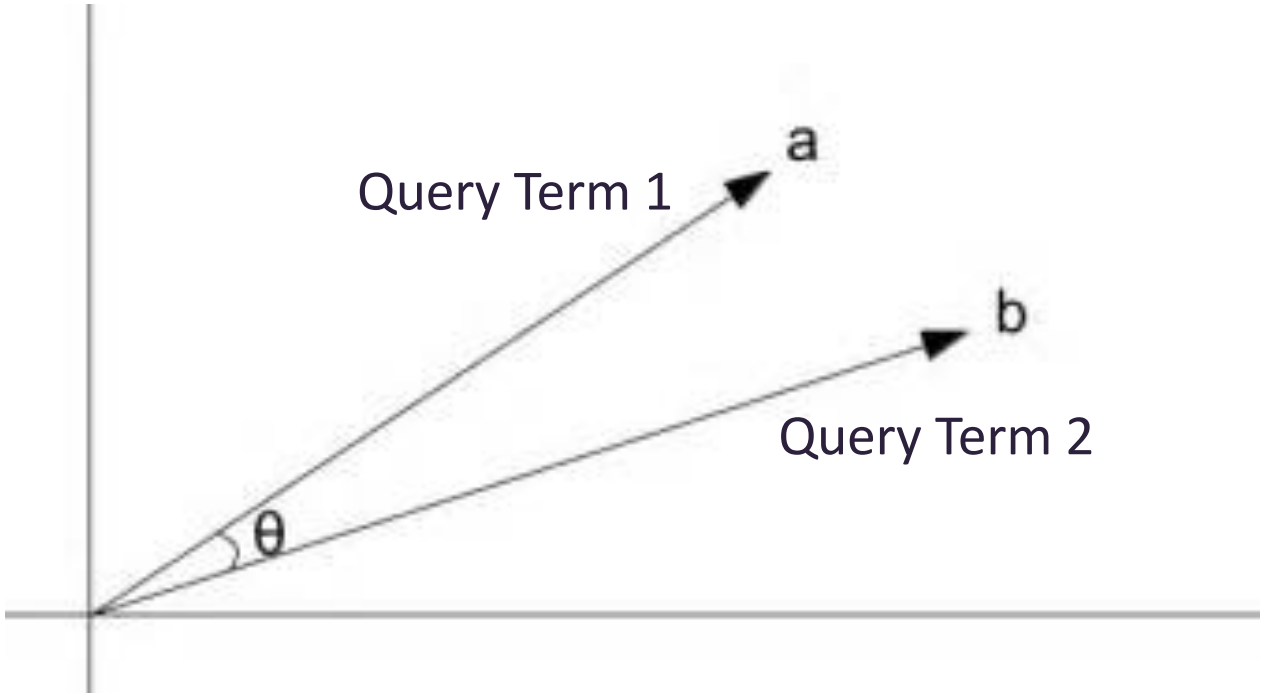


Image credit: https://engineering.aweber.com/cosine-similarity/

Word2Vec + Overlapping Search Terms

Python, Programming

programming<-->python: 0.61

(python AND programming)

Hiking, Art

art<-->hiking: 0.10

(hiking OR art)

Topic Diversity

Writing

A Conversation with David Gerrold, Writer of Star Trek: The Trouble with Tribbles - Teletalk (58 minutes)

Star Trek: Science Fiction to Science Fact - STEM in 30 (28 minutes)

Python

Pythons Positive Press Pumps Pandas

Why is Python Growing So Quickly? - Stack Overflow Blog

Python explosion blamed on pandas

Visual – Topic Diversity

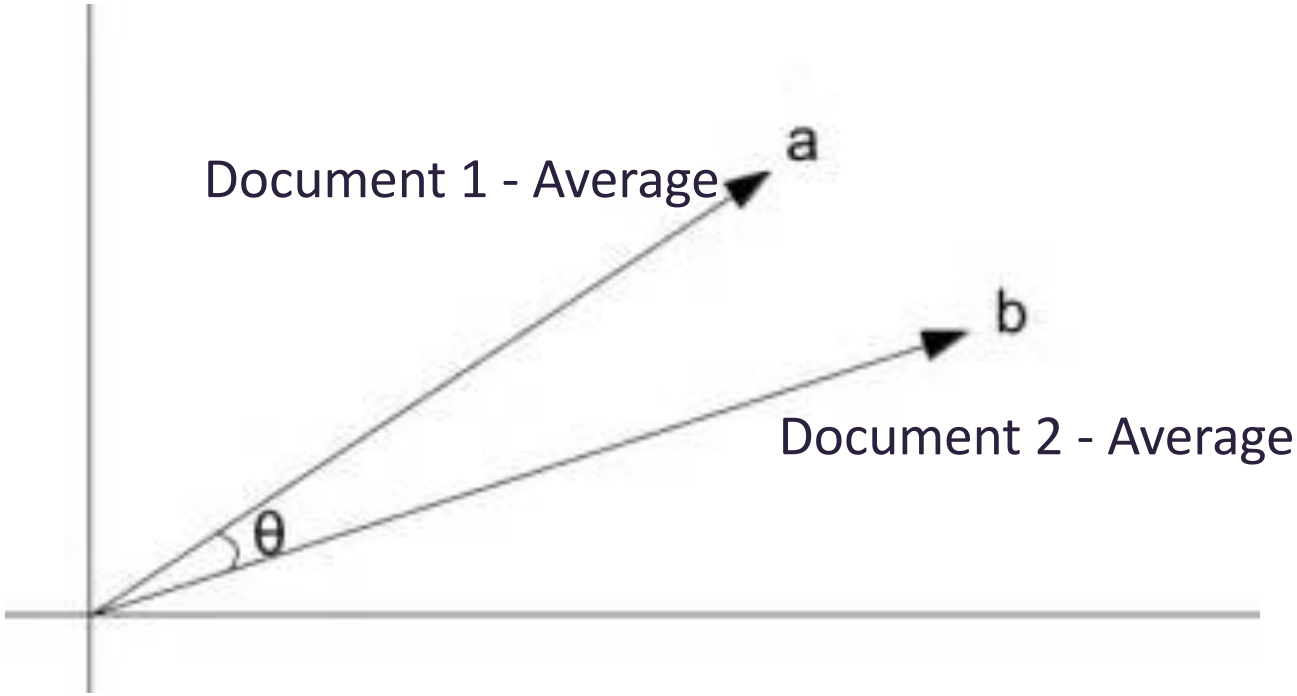


Image credit: https://engineering.aweber.com/cosine-similarity/

Pick one, find the least related (Python + Pandas)

Python explosion blamed on pandas: 1.0
Considering Python's Target Audience: 0.97
Animated routes with QGIS and Python: 0.97
I can't get some SQL to commit reading data from a database: 0.97
Using Python to build an AI Twitter bot people trust: 0.96
Getting a Job as a Self-Taught Python Developer: 0.96
Download and Process DEMs in Python: 0.96
How to mine newsfeed data and extract interactive insights in Python: 0.94
Differential Equation Solver In MATLAB, R, Julia, Python, C, Mathematica, Maple, and Fortran: 0.86
My personal data science toolbox written in Python: 0.75

1 min 30 seconds @ 16 parallel threads

Technique - Summary

- Get top X results, re-shuffle
- More computing resources + data -> higher relevance

Where Word2Vec Works

- Synonym generation
- Improve recall
- Search suggestions
- Incorporate secondary dataset (e.g. for enterprise search, privacy)

Why Scala?

- Ecosystem: Lucene, Spark
- Dependency Management

Performance

- Models take 1-2 weeks to train
- Some of computations take minutes, which would not work in a search engine
- Changes:
  - Pre-compute tokens (e.g. use Lucene)
  - Pre-compute averages (don’t naturally store in Lucene)
  - Hazelcast

How do you tell if your code is running on a GPU (Spark + Deeplearning4j)

- 15:17:27,828 INFO ~ Loaded [CpuBackend] backend
- 15:17:28,008 INFO ~ Number of threads used for NativeOps: 4
- 15:17:29,182 INFO ~ Number of threads used for BLAS: 4
- 15:17:29,185 INFO ~ Backend used: [CPU]; OS: [Windows 10]
- 15:17:29,185 INFO ~ Cores: [8]; Memory: [3.6GB];
- 15:17:29,185 INFO ~ Blas vendor: [MKL]
- 15:17:34,546 INFO ~ Using Spark Local

CUDA

- Switch between CPU and GPU by changing sbt configuration:

- Threading resources. Execution pipelines on host systems can support a limited number of concurrent threads. Servers that have four hex-core processors today can run only 24 threads concurrently (or 48 if the CPUs support HyperThreading.) By comparison, the smallest executable unit of parallelism on a CUDA device comprises 32 threads (termed a warp of threads). Modern NVIDIA GPUs can support up to 1536 active threads concurrently per multiprocessor (see Section F.1 of the CUDA C Programming Guide). On GPUs with 16 multiprocessors, this leads to more than 24,000 concurrently active threads.

Hazelcast

- Just videos – 241.8 minutes
- Nothing cached, but hazelcast- 76 minutes
- On query combos – 234 minutes
- Adding Hazelcast on queries - 62.091
- After all cached – 2.38
- Move word2vec model from spinner to SSD:

jCuda

```
def memory = {
  cuInit(0)
  val device = new CUdevice
  JCudaDriver.cuDeviceGet(device, deviceId)

  val total = Array(0L)
  val free = Array(0L)
  cuInit(0)
  cuDeviceGet(device, deviceId)

  val context = new CUcontext
  cuCtxCreate(context, 0, device)
  cuMemGetInfo(free, total)

  cuCtxDestroy(context)

  (total(0), free(0))
}
```

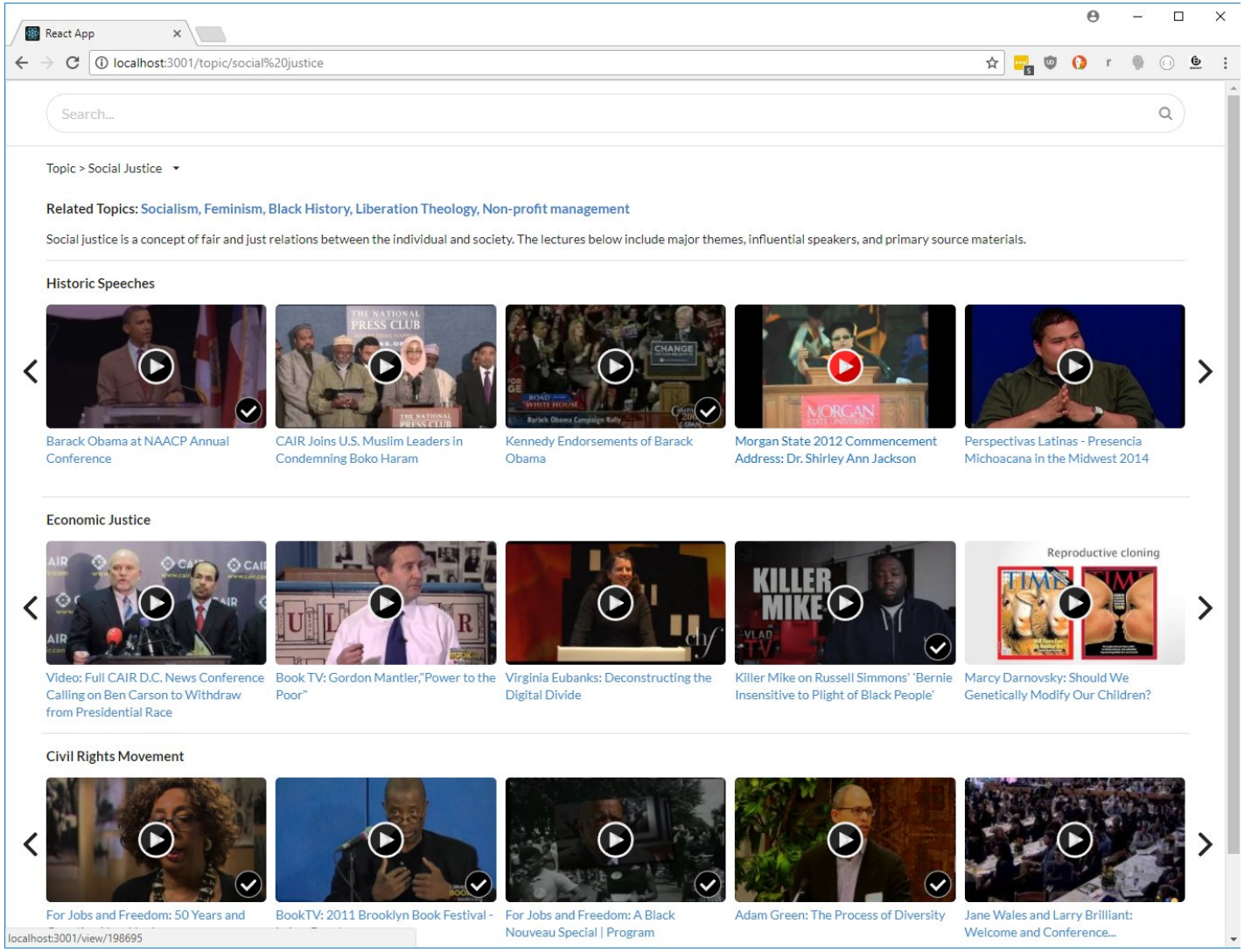
Tokenize - Lucene

```
def getTokens(text: String): List[String] = {
  val result = new util.ArrayList[String]()
  val analyzer: Analyzer = new StandardAnalyzer()

  val stream: TokenStream = analyzer.tokenStream(null, new StringReader(text))
  stream.reset()

  while (stream.incrementToken) {
    result.add(stream.getAttribute(classOf[CharTermAttribute]).toString())
  }

  import scala.collection.JavaConversions._
  result.toList
}
```

Other Lessons

- Inventing your own math does not work
  - High-dimensional “objects” do not follow your intuition like 2D/3D
  - Floating point math not associative
- Math in papers is untyped
  - ”Distance” between two vectors – cosine, euclidean, manhattan?
  - vs. Probability curves
  - Unlike Physics (types naturally compose, $kg \cdot m^2 \cdot s^{-2}$)
- Follow a paper
  - Nearly impossible to test on your own
  - Almost no one publishes code

Next Idea…


React App
localhost:3001/topic/social%20justice
Search...
Topic > Social Justice
Related Topics: Socialism, Feminism, Black History, Liberation Theology, Non-profit management
Social justice is a concept of fair and just relations between the individual and society. The lectures below include major themes, influential speakers, and primary source materials.
Historic Speeches
Barack Obama at NAACP Annual Conference
CAIR Joins U.S. Muslim Leaders in Condemning Boko Haram
Kennedy Endorsements of Barack Obama
Morgan State 2012 Commencement Address: Dr. Shirley Ann Jackson
Perspectivas Latinas - Presencia Michoacana in the Midwest 2014
Economic Justice
Video: Full CAIR D.C. News Conference Calling on Ben Carson to Withdraw from Presidential Race
Book TV: Gordon Mantler,"Power to the Poor"
Virginia Eubanks: Deconstructing the Digital Divide
Killer Mike on Russell Simmons' 'Bernie Insensitive to Plight of Black People'
Reproductive cloning
Marcy Darnovsky: Should We Genetically Modify Our Children?
Civil Rights Movement
For Jobs and Freedom: 50 Years and
BookTV: 2011 Brooklyn Book Festival -
For Jobs and Freedom: A Black Nouveau Special | Program
Adam Green: The Process of Diversity
Jane Wales and Larry Brilliant: Welcome and Conference...
localhost:3001/view/198695

CUDA Surprises

- High end GPUs don't do video
- A ton of people are using these for bitcoin mining (see local craigslist)
- CUDA uses a lot of CPU
- Floating-Point Math Is Not Associative
- "…the peak theoretical memory bandwidth of the NVIDIA Tesla M2090 is 177.6 GB/sec: (1.85 × 109 × (384/8) × 2) / 109 = 177.6 GB/sec"
- "…. the peak theoretical bandwidth between host memory and device memory (8 GB/s on the PCIe ×16 Gen2).
- "…if, switch, do, for, while significantly affect throughput ... The different execution paths must be serialized, since all threads of a warp share a program counter; this increases the total number of instructions executed for this warp"

Resources

- "Relevant Search"
- “Deep Learning – A Practitioner’s Approach”
- Deeplearning4j
- Gensim
- https://github.com/DiceTechJobs/ConceptualSearch
- https://www.reddit.com/r/datasets/comments/3mg812/full_reddit_submission_corpus_now_available_2006/

FindLectures.com

Weekly Emails with Lunch and Learn Suggestions

http://findlectures.com/emails

Next installment:

Java Users Group In February 2018

“GPU Programming for Java Developers”

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https://www.garysieling.com

https://github.com/garysieling/

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