Algorithms in Everyday Life

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https://www.cpcstrategy.com/blog/2018/08/facebook-algorithm/

Innovative Thinking in the Digital Age
Osher Lifelong Learning Institute at Vanderbilt University
January 16, 2019

January 16. Algorithms and Everyday Life.
Douglas H. Fisher, Associate Professor of Computer Science. Faculty Director, Warren College.

January 23. Artificial Intelligence and Everday Life.
Douglas H. Fisher, Associate Professor of Computer Science. Faculty Director, Warren College.

January 30. What and How Do We Know?—Data and Discourse on the Internet.
Hanna Kiri Gunn, Mellon Assistant Professor of Philosophy

February 6. New Ways of Telling Stories in a Digital Age.
Madeline Casad, Senior Lecturer, Cinema and Media Arts. Associate Director, Digital Humanities Center

February 13. Libraries and the Tools of Digital Innovation.
Andrew Wesolek, Director of Digital Scholarship and Scholarly Communication, Jean and Alexander Heard Libraries

February 20. Innovation and Technology Transfer.
Alan Bentley, Vice-Chancellor, Center for Technology Transfer and Commercialization

I look virtually everything up. It's low hanging fruit for good Ideas and helpful information.

Google

algorithms in daily life

All   Images   News   Videos   Shopping   More   Settings   Tools

About 46,000,000 results (0.42 seconds)

Interesting Examples of algorithms in everyday life - GeeksforGeeks
https://www.geeksforgeeks.org/interesting-examples-of-algorithms-in-everyday-life/
Interesting Examples of **algorithms in everyday life**. Ever found shortest path from Place A to Place B on Google Maps? Ever rolled a dice just by a click in an ...

Algorithms in our daily life - Livemint
https://www.livemint.com › Specials
Aug 27, 2013 - Every time you access an ATM, book a ticket or buy online, you are expanding the scope and range of **algorithms**. And their use is only likely to ...

Why and how are algorithms important in our daily life? - Quora
https://www.quora.com/Why-and-how-are-algorithms-important-in-our-daily-life
Aug 2, 2018 - Common-sensical math and physics is enough for most people to get around (like crossing the lawn takes shorter time than going around it etc). **Algorithms** do ...

What are some interesting books on **algorithms** governing our ...	Apr 20, 2018
Why do we use **algorithms**, and how is it helpful in our **daily life**?	Feb 18, 2018
What is the **daily life** examples for **algorithm**, flow chart, and ...	Aug 17, 2017
What are the best application of **algorithms** in real **life** ?	Aug 30, 2014

More results from www.quora.com

Tomorrow's World - How do algorithms run my life? - BBC
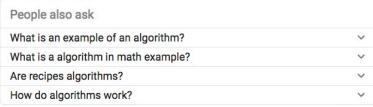www.bbc.co.uk/guides/z3sg9qt
Jump to Powering our **daily lives** - Powering our **daily lives**. face detection neon grid. Alamy. In airport security, computers use cameras and facial ...
Like magic · The future of algorithms

Prelab 2: Everyday Algorithms
db.cs.duke.edu/courses/summer04/cps001/labs/plab2.html
We can use **algorithms** to describe ordinary activities in our **everyday life**. For example, we can consider a recipe as an **algorithm** for cooking a particular food.

People also ask

What is an example of an algorithm?
What is a algorithm in math example?
Are recipes algorithms?
How do algorithms work?

Feedback

Discuss: Algorithms in your life (article) | Khan Academy
https://www.khanacademy.org/.../algorithms/...algorithms/.../discuss-algorithms-in-yo...
Read and learn for free about the following article: Discuss: **Algorithms** in your life. ... What **algorithms** do you use in **everyday life**? Do you think you could write a ...

How to use algorithms to solve everyday problems | MIT Sloan
https://mitsloan.mit.edu/ideas...to.../how-to-use-algorithms-to-solve-everyday-problem...
May 8, 2017 - Faster grocery trips. Better Facebook posts. Ali Almossawi on **algorithmic** thinking for **daily life**.

What is an algorithm?

An algorithm is a sequence of steps
- to perform a task
- given an initial situation (i.e., the input)

Why are algorithms important?

- Algorithms are pervasive

- They organize thought and action (computational thinking)

- They can be made very precise for implementation on computers, smart phones, and other devices
  - in a variety of programming languages (e.g. Python, R, Java)
  - as computer programs, software packages, mobile apps

- A computer program is an implemented algorithm
  - We might use the terms synonymously, but there can be important Intellectual Property (IP) distinctions (ask Alan Bentley on February 20)

Examples of Algorithms

- A recipe is a high level algorithm

  Midlothian Oat Cakes from "*Scottish Fare*" by Norma and Gordon Latimer (1983)

  ½ cup oats

  1 cup oatmeal

  …

  Place flour, oatmeal, baking powder, and salt in a bowl. Melt the butter. Make a well in the centre of the flour mixture and add the melted butter … Roll out dough and cut into rounds … Bake in a warm oven (300F) for 30 minutes.

- Addition and subtraction and other arithmetic operations are algorithms

					1	21	21
532	532	532	532	482	482	482	482
+ 101	101	101	101	598	598	598	598
----	----	----	----	025	025	025	025
	3	33	633	----	----	----	----
initial	add	add	add		5	05	1105
	1st	2nd	3rd		add 1st	add 2nd	add 3rd
	column	column	column		carry 1	carry 2	

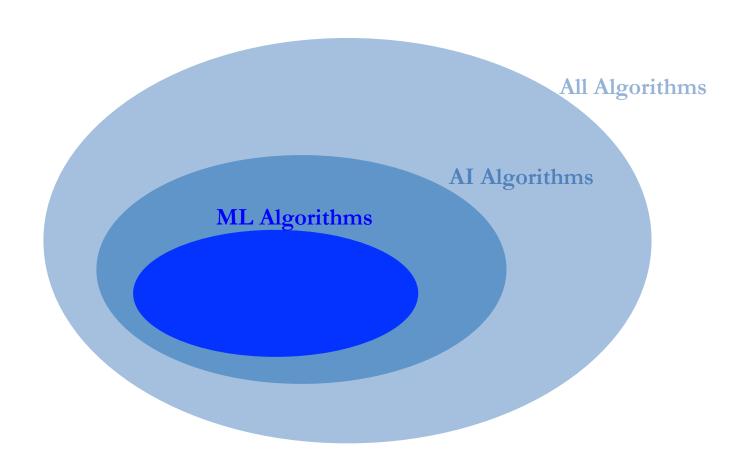if single column sum > #rows*9 then error

What makes a good algorithm?

- Correctness: the algorithm performs the task without error

- Efficiency: the algorithm uses as little time and/or as little space as necessary, but there is almost always a tradeoff between time and space

- Comprehensibility: the algorithm can be understood (which helps with human efficiency)

Illustration: Sorting final exams by last name

- Selection Sort

- Insertion Sort

- Merge Sort
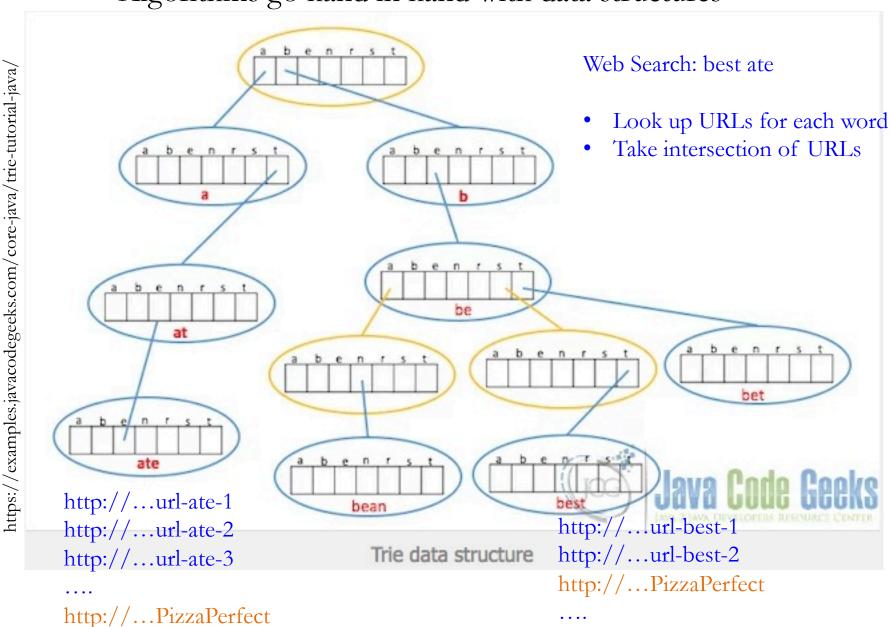 - An example of a Divide and Conquer algorithm

Relationship between
All algorithms, AI algorithms, and Machine Learning (ML) algorithms

Illustrating an AI algorithm, a non-AI algorithm, and a ML algorithm

Google Directions is an AI (optimization) algorithm:
it explores many route options and returns the best few

AI: exploration

© Google

I can select and modify a route: this is human-computer interaction

Actually following a single route is a
non-AI (deterministic) algorithm

Doug selected the bottom route and changed
it to swing closer to Fall Creek Falls State Park.

In fact, Doug more often than not chooses routes that swing close to state parks. I will start
favoring routes that swing past state parks when searching for Doug – this is Machine Learning!

Algorithms go hand in hand with data structures

Web Search: best ate

- Look up URLs for each word
- Take intersection of URLs

Trie data structure

http://…url-ate-1
http://…url-ate-2
http://…url-ate-3
….
http://…PizzaPerfect

http://…url-best-1
http://…url-best-2
http://…PizzaPerfect
….

Java Code Geeks
JAVA, JAVA DEVELOPERS RESOURCE CENTER

Moral Algorithms

Fairest Path Calculation

This flowchart represents
an algorithm

Unexpected situation detected

Retrieve automated car's information

Detect all objects in the scene that could potentially be involved with the decision-making process

Store objects and their information

Use the initial output (no action taken by the car)

Transmit the chosen output to the car so it acts accordingly

Run simulation of damages received by each human with current output

Search for alternatives. Is there another output?

YES

Compare all outputs and select the one with the least overall damages to humans

Store damages for current output

Keep current dataset

YES

Do all outputs involve at least one death?

NO

Purge outputs that include death

NO

http://mchrbn.net/ethical-autonomous-vehicles/

This is rudimentary AI. This is a reactive AI, but
better still are AIs that plan ahead. We want
an AI that is a better defensive driver than
we could ever be, and we want a social AI that
talks to other task-relevant AIs in an
"Internet of Things"

What are other smart city algorithm possibilities?

What are other smart city algorithm possibilities?

- Dynamic vehicle rerouting

- Bus arrival times

- Available parking

- Crime monitoring

- Police patrol routing (to empty houses identified through zero energy use)

- Delivery and mail truck routing (no left turns)

- Reporting erratic driving

Algorithms for controlling social communication

Mark Zuckerberg ✓
about 7 months ago

One of our big focus areas for 2018 is making sure the time we all spend on Facebook is time well spent.

We built Facebook to help people stay connected and bring us closer together with the people that matter to us. That's why we've always put friends and family at the core of the experience. Research shows that strengthening our relationships improves our well-being and happiness.

But recently we've gotten feedback from our community that public content -- posts from busine... See More

👍 215K   💬 19K   ➤ 29K

What is the update?

T...y we use signals like how many people react to, comment on or share posts to d...mine how high they appear in News Feed.

With this update, we will also prioritize posts that spark conversations and meaningful interactions between people. To do this, we will predict which posts you might want to interact with your friends about, and show these posts higher in feed. These are posts that inspire back-and-forth discussion in the comments and posts that you might want to share and react to – whether that's a post from a friend seeking advice, a friend asking for recommendations for a trip, or a news article or video prompting lots of discussion.

Lets consider ways of implementing the Facebook algorithm

I have a recent post with 156 comments
    14 reactions, no shares

A music post (Ramble Tamble, CCR)

I have a recent post with 0 comments
    1 reaction, no shares

A political post on immigration

I have a recent post with 3 shares,
    7 reactions, no comments

A dachshund puppy playing with
    a door jam post (so cute)

https://www.facebook.com/animalandpetaddicts/videos/
2284417705208611/
UzpfSTU2MDc2MDI4ODoxMDE1NjY4MzgxMDc0NTI4OQ/

Facebook posts are undoubtedly analyzed by content

- Probably using a bag of words approach

"Vanderbilt University launched The Ethics of Artificial Intelligence course this semester. The course considers the immediate moral and legal repercussions of AI presence in our society, in sectors such as law, medicine, transportation, and the environment; and the possibility of consciousness, cognition, conation and emotion in an artificial being of the future, and the implications of that possible reality. Our aim is to equip students with the scientific/technological knowledge and critical capacity to engage in discourse about rapidly evolving AI technology and its societal implications."

Prioritize this post on the Facebook news feed of anyone from Vanderbilt (?), anyone who has posted about AI themselves (?), anyone who has posted about the "evil" of "AI" themselves (?), etc, all based on a bag of words

"Vanderbilt University" "Ethics" "Artificial Intelligence" "course" "moral" "legal" "repercussions" "law" "medicine" "transportation" "environment" "consciousness" "cognition" "conation" "emotion" "artificial" "future" "reality" "students" "scientific" "technological" "knowledge" "critical capacity" "discourse" "AI technology" "societal implications"

What are potential negative consequences of Facebook's strategy to "spark conversations" and "meaningful interactions" between "friends"?

What are potential negative consequences of Facebook's strategy to "spark conversations" and "meaningful interactions" between "friends"?

- Raise the power of memes to diminish discourse: memes often trigger lots of responses, rarely meaningful in my experience

- A "No one likes me" reaction if Facebook prioritizes your posts to others

Speaking for myself, I believe in the potential of social networks to raise the level of discourse (and started a Facebook Group called *Productive Talk*, which encourages members to jointly write letters on topics of agreement to political leaders)

An algorithm you may never see
Encryption

Used to render sensitive data difficult to see

- Patient medical data

- Financial data

- Business operational data

- Proprietary software

Innovative Thinking in a Digital Age
Some Issues to Think About

What power and authority have humans assigned to algorithms?

- Algorithms (e.g., of retailers) place information of our computers that are then accessed by other software
- Algorithms (e.g., of social media) control what I see
- Poorly designed algorithms can introduce errors or inequities
  - withdraw $1000 from account A,
  - deposit $1000 to account B,
  - compute interest on account A
  - compute interest on account B

  versus
  - withdraw $1000 from account A,
  - compute interest on account A
  - compute interest on account B
  - deposit $1000 to account B
- Algorithms can limit what is possible (e.g., hyphenated last name; no last name)

What world views, preconceptions, or prejudices exist within algorithms and their application?

- Machine learning and AI can reinforce bias (next week)
- Social media does not adequately vet material for accuracy
- Social media may mislead me about my social network impacting my self worth

How can algorithms and their creators be held accountable?

- Legal recourse
- Error disclosures
- Public pressure
- Professional Societies

What kind of education would you recommend for a programmer, statistician, or data specialist?

- In addition to technology courses, courses in ethics and code of conducts, and better yet the interleaving of ethics in technology courses;
- Inclusion of human factors and behavioral sciences

Criteria for Accrediting Computing Programs, 2018-2019

Home > Accreditation > Accreditation Criteria & Supporting Documents > Criteria for Accrediting Computing Programs, 2018-2019

ABOUT ABET

ACCREDITATION

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Why ABET Accreditation Matters

What Programs Does ABET Accredit?

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Assessment Planning

Request for Evaluation (RFE)

Changes During the Period of Accreditation

Decision & Notification

Promote Your ABET Accreditation

Accreditation Outside the U.S.

Reaccreditation

PDF Version

Definitions

I. General Criteria

General Criterion 1. Students

General Criterion 2. Program Educational Objectives

General Criterion 3. Student Outcomes

General Criterion 4. Continuous Improvement

General Criterion 5. Curriculum

General Criterion 6. Faculty

General Criterion 7. Facilities

General Criterion 8. Institutional Support

II. Program Criteria

General Criterion 3. Student Outcomes

The program must have documented student outcomes that prepare graduates to attain the program educational objectives. There must be a documented and effective process for the periodic review and revision of these student outcomes.
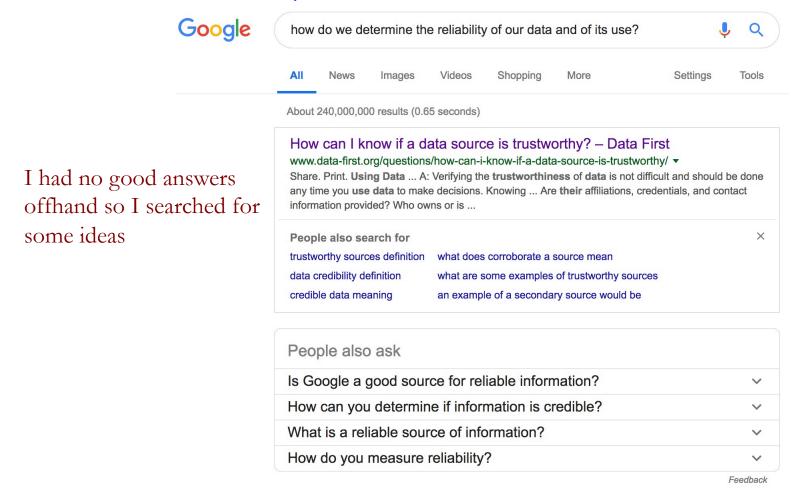
The program must enable students to attain, by the time of graduation:

(a)An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline

(b)An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution

(c)An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs

(d)An ability to function effectively on teams to accomplish a common goal

(e)An understanding of professional, ethical, legal, security and social issues and responsibilities

(f)An ability to communicate effectively with a range of audiences

(g)An ability to analyze the local and global impact of computing on individuals, organizations, and society

(h)Recognition of the need for and an ability to engage in continuing professional development

(i)An ability to use current techniques, skills, and tools necessary for computing practice.

How are digital tools creating gaps of innovation or of mind sets by age, race, economic status ?

- I do not see a lot of older folks participating in technical entrepreneurship, where I think they would add wisdom from life experiences
- Women and racial minorities are under-represented in computing

How do we determine the reliability of data and of its use?

I had no good answers offhand so I searched for some ideas

How is the human mind being changed by the existence of digital tools? Is the tool that can solve a problem determining how humans conceive and imagine and create or are humans still in charge of the tool as a means to innovation?

Yes. Sometimes I think the move is positive. Excel encourages a way of thinking about and experimenting with data. In other cases, technology can restrict users in certain ways. Database designs can be particularly bad as this – for example, most funding agencies ask for a single primary investigator; I believe tax forms Still ask for tha taxpayer and the spouse if filing jointly.

Do doctors have much underlying knowledge about potential drug interactions now that AIs exist to do that analysis? This is an instance of a longer, more general argument about whether technology dumbs us down or frees us to do higher cognitive tasks

How does innovation occur in the digital age? What role does collaboration play? Is a "super mind" in which humans, in various groups and networks, work collaboratively with computers a feasible vision of future optimal use of the potential of digitally-based technology?

The most highly cited engineers tend to be the most collaborative. Computer Science is one of the most collaborative fields. Development involves many engineers, and should involve behavioral scientists and other stake holders.

How is digitalization affecting the preservation and collection of the artifacts of culture? The dissemination and accessibility of knowledge and information?

In principle, I think the conservation is significant, but 15 years ago I read that it was the time of greatest archival of information, but also the greatest loss of information (as technology changed so quickly **– see pic on next slide**). Computing have enabled significant saving of languages, that would otherwise be lost.

Here is a suspicion for which some scholarship has probably been done: there is less citation of research papers that are **<u>not</u>** available on the Web than there are for research papers that are available of the Web.

What kinds of innovative applications of digital technology are attractive for licensing and commercial sale and does commercial potential influence the nature of research?

Definitely ask Alan on February 20

In your opinion, do the convenience, efficiency, and benefits of digital innovation outweigh the dangers it may pose?

I don't think that there is any such thing as "outweighing" in totality. We must have more nuanced assessments. I'll say this – as technology changes, we all seem to be along for the ride, whether we are technology professionals or not!!!

Our ability to collect data is amazing, and while the technology exists to protect it, some companies and other groups appear to be sloppy

My father's last home computer, when floppy disks were really floppy, now under my desk at the office. There is much information on those disks, but that information may be effectively lost because of changing technology, short of a concerted effort by me to retrieve it.

The picture of my father and me in the upper left is certainly sentimental, and that picture is now safely "in the cloud." The Cloud includes Facebook, Google Drive, and other platforms. I trust these platforms to "migrate" material as technology changes more than I trust myself to migrate that material from computer to computer as technology changes.