

# Lecture I

## How to Use Search Engine Efficiently -- Exemplified by Bing

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# 声明

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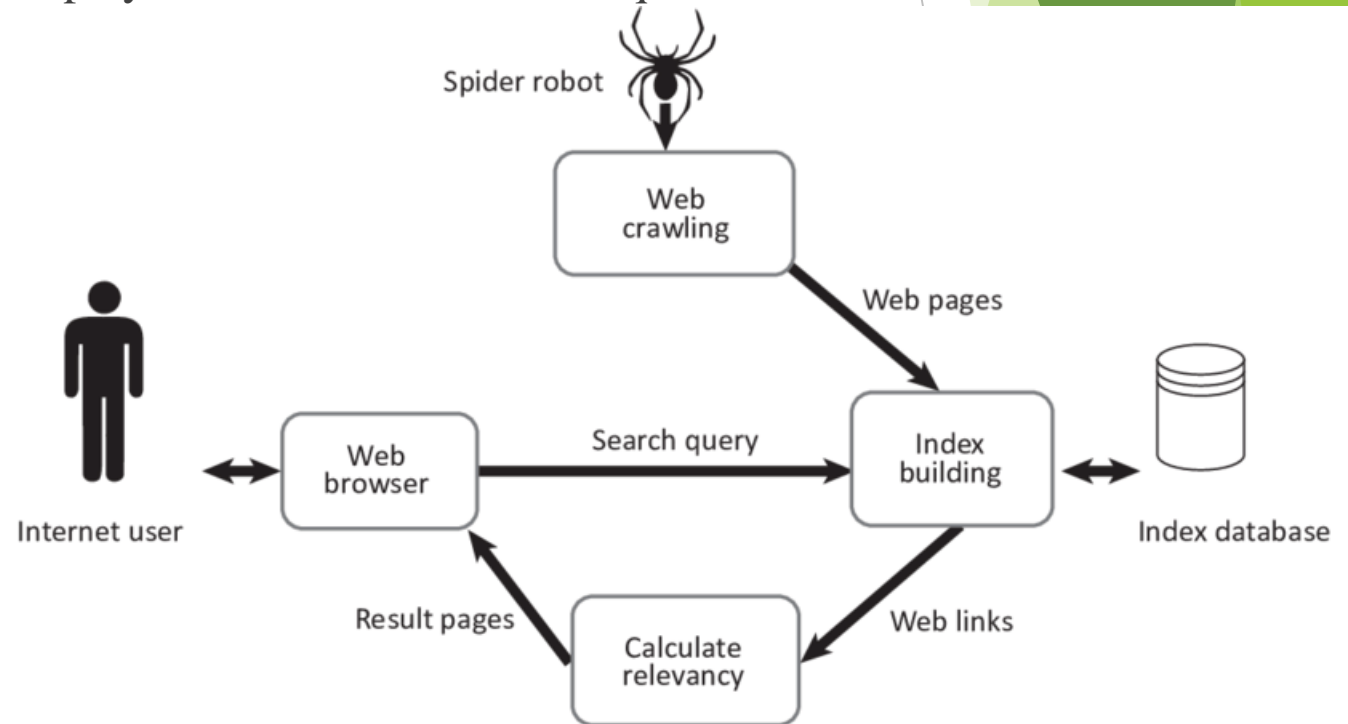
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# Concept of Search Engine

- ▶ A search engine is a software program that helps people find the information they are looking for online using keywords or phrases.
- ▶ Search engines are able to return results quickly—even with millions of websites online—by scanning the Internet continuously and indexing every page they find.
- ▶ When a user enters a search term, the search engine looks at the website page titles, contents and keywords it has indexed and uses algorithms (step-by-step operations) to produce a list of sites—with the most relevant websites at the top of the list. Popular search engines include Google, Bing and Baidu.
- ▶ Companies use search engine optimization (SEO) to help search engines recognize their websites as highly relevant to particular searches.

# Working Principles of Search Engine

- ▶ Search engines work through three primary functions:
  - ▶ Crawling: Scour the Internet for content, looking over the code/content for each URL they find.
  - ▶ Indexing: Store and organize the content found during the crawling process. Once a page is in the index, it's in the running to be displayed as a result to relevant queries.
  - ▶ Ranking: Provide the pieces of content that will best answer a searcher's query, which means that results are ordered by most relevant to least relevant..



# Importance of Search Engine

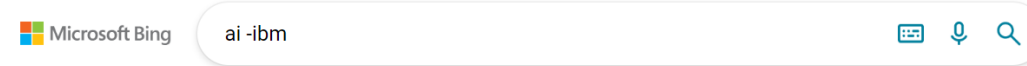
- ▶ It is estimated that the average person living in a modern industrialized society is exposed to as many different pieces of information in a single day as a person living 100 years ago would have seen in a year.
- ▶ With this information overload, it is next to impossible to remember everything to do business effectively. That's why we use tools to do the remembering and information retrieval for us. When we want to find products, services or pieces of information online, search engines are undoubtedly the better choice.
- ▶ Search engines provide users with search results that lead to relevant information on high-quality websites. What this means is that search engines provide users with the information they are looking for, and not necessarily the information that marketers would like them to see. Search engines matter because they increasingly determine the information that we want to access online.

# Advanced Techniques of Search Engine

- ▶ Although most search engines provide a simple interface to interact with users and try to return the optimal results, however, the user can further customize the search criteria for more matching results.
- ▶ Most search engines provide searching syntax to refine the searching result. To mitigate the difficulty when user switches from one engine to another, search engines tend to share the majority of the syntax, which consists of a set of operators. We introduce these syntax with exemplified by Bing.
- ▶ Bing search operators are special commands typed into Bing to refine, narrow down and filter the search results. As aforementioned, many Bing search operators also work with Google and other search engines.
- ▶ Usually, to use search operators of Bing is simple, just type the search operator or a group of search operators into the search box, then append the keyword or keywords one wants to research. The following slides demonstrate some of these.

# The Minus Symbol

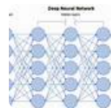
- ▶ - lets you exclude web pages containing a specific term or phrase. This one works in opposition to the plus symbol above.
- ▶ Example: ai -ibm
- ▶ This search command will display web pages containing the word “ai” but will exclude web pages with the word “ibm”. One would use this command to find web pages that talk about ai but don’t include the word “ibm”.



## What is Artificial Intelligence (AI)? | IBM

<https://www.ibm.com/cloud/learn/what-is-artificial-intelligence>

Jun 3, 2020 · **Artificial General Intelligence** (AGI), or general AI, is a theoretical form of AI where a machine would have an intelligence equal to humans; it would have a self-aware consciousness that has the ability to solve problems, learn, ...



[IBM Cloud Education](#)

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## What is Artificial Intelligence (AI)? | Oracle

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AI which stands for **Artificial Intelligence** is a technology that mimics human intelligence to perform tasks and can iteratively improve themselves based on the information they collect



## What is Artificial Intelligence (AI)? | Oracle

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AI which stands for Artificial intelligence is a technology that mimics human intelligence to perform tasks and can iteratively improve themselves based on the information they collect. Artificial intelligence (AI) delivers business growth, ...



**What is AI in science?**

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## Overview of AI Builder - AI Builder | Microsoft Learn

<https://learn.microsoft.com/en-us/ai-builder/overview>

Sep 19, 2022 · AI Builder is a Microsoft Power Platform capability that provides AI models that are designed to optimize your business processes. AI Builder enables your business to use ...



## Artificial Intelligence Solutions & Services – Microsoft AI

<https://www.microsoft.com/en-us/ai>



# The Quotation Marks

- ▶ " " lets you find the exact match to the word put in " ".
- ▶ Example: “fuzzy machine learning”
- ▶ This search parameter will find web pages that contain the exact phrase put into quotation marks. One would use this command to find web pages that specifically talk about fuzzy machine learning.

Microsoft Bing

fuzzy machine learning



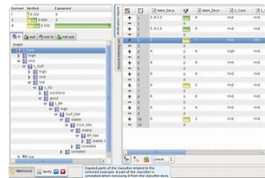
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1,120,000,000 Results Any time ▾

A machine learning method based on fuzzy logic has been developed to **extract relationships, modelled as rules, from a dataset.**

Machine Learning with Fuzzy Logic - Towards Data Science

[towardsdatascience.com/machine-learning-with-fuzzy-logic-52c85b46bfe4](https://towardsdatascience.com/machine-learning-with-fuzzy-logic-52c85b46bfe4)



Was this helpful?

## People also ask

What is the definition of fuzzy logic? ▾

What are the applications of fuzzy logic? ▾

What is fuzzy logic algorithm? ▾

Microsoft Bing

"fuzzy machine learning"



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Fuzzy Machine Learning Methods | SpringerLink

[https://link.springer.com/chapter/10.1007/978-3-662-56339-7\\_6](https://link.springer.com/chapter/10.1007/978-3-662-56339-7_6) ▾

Sep 23, 2022 · The implementation of fuzzy machine learning processes is started by system analysis of the “sample-attribute-factor” system. The notations of which are shown in Table ...

Email: [splin@sjtu.edu.cn](mailto:splin@sjtu.edu.cn)



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Fuzzy methods in machine learning and data mining

<https://www.sciencedirect.com/science/article/pii/S0165011405002861>

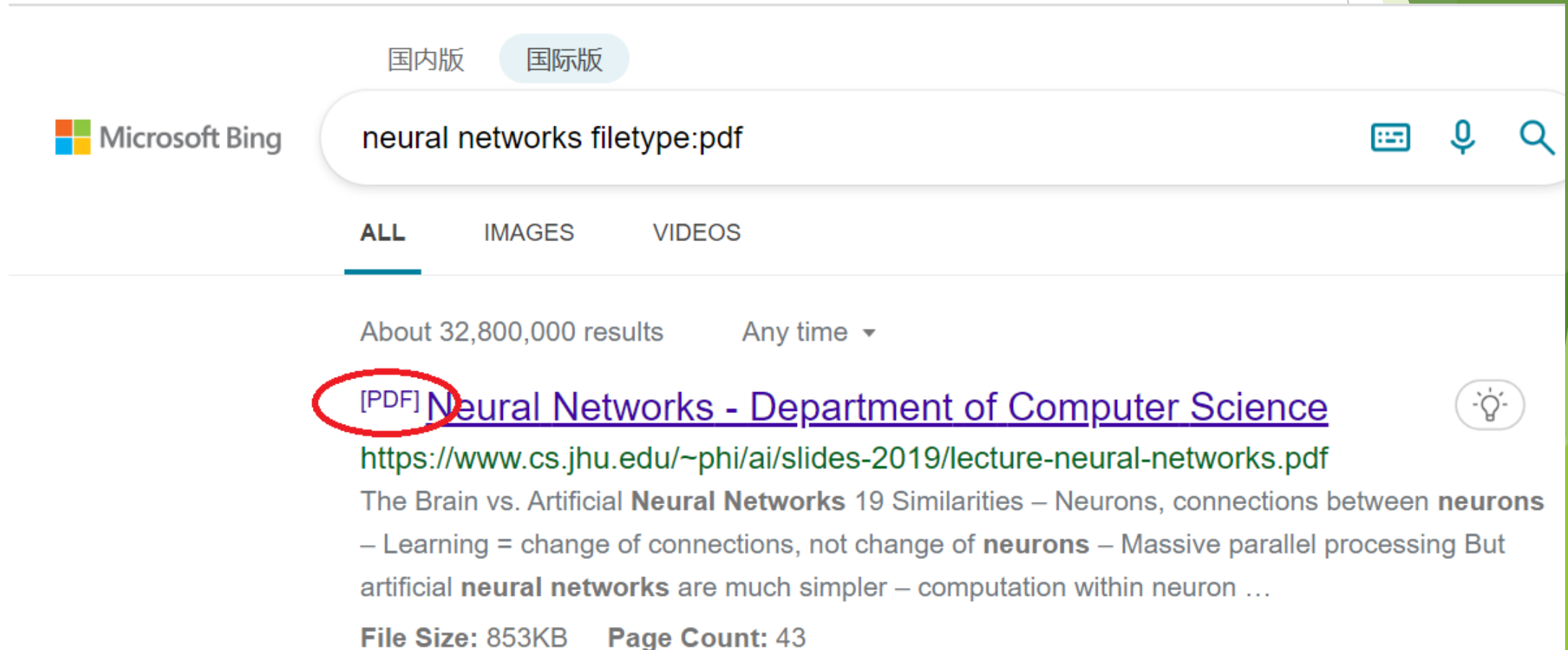
Dec 16, 2005 · Fuzzymethodsincase-basedlearning Case-based or instance-based learning





# The filetype Operator

- ▶ Sometimes, you want to search web resource of a specific file type, for example, ppt, pdf, etc. The filetype operator can fulfill your expectations.
- ▶ Example: neural networks filetype:pdf



The screenshot shows a Microsoft Bing search interface. At the top, there are tabs for '国内版' (Domestic Version) and '国际版' (International Version). The search bar contains the text 'neural networks filetype:pdf'. Below the search bar, there are filters for 'ALL', 'IMAGES', and 'VIDEOS', with 'ALL' being the selected filter. The search results show 'About 32,800,000 results' and 'Any time' filter. The first result is titled '[PDF] Neural Networks - Department of Computer Science', with the '[PDF]' part circled in red. The URL is 'https://www.cs.jhu.edu/~phi/ai/slides-2019/lecture-neural-networks.pdf'. The description below the URL reads: 'The Brain vs. Artificial **Neural Networks** 19 Similarities – Neurons, connections between **neurons** – Learning = change of connections, not change of **neurons** – Massive parallel processing But artificial **neural networks** are much simpler – computation within neuron ...'. At the bottom, it shows 'File Size: 853KB' and 'Page Count: 43'.

国内版 国际版

Microsoft Bing

neural networks filetype:pdf

ALL IMAGES VIDEOS

About 32,800,000 results Any time ▾

[PDF] Neural Networks - Department of Computer Science

<https://www.cs.jhu.edu/~phi/ai/slides-2019/lecture-neural-networks.pdf>

The Brain vs. Artificial **Neural Networks** 19 Similarities – Neurons, connections between **neurons** – Learning = change of connections, not change of **neurons** – Massive parallel processing But artificial **neural networks** are much simpler – computation within neuron ...

File Size: 853KB Page Count: 43

# The language Operator

- Sometimes, you want to search web resource of a specific file type, for example, ppt, pdf, etc. The filetype operator can fulfill your expectations.
- Example: machine learning language:zh

## 五分钟明白Machine Learning是什么 - 知乎

<https://zhuanlan.zhihu.com/p/43616154> ▼

**Machine Learning**是一门无需明确编程就能让计算机行动的科学。在过去的十年里，机器学习给我们带来了自动驾驶汽车，实用的语音识别，有效的网络搜索，以及对人类基因组的巨大了解。机器学习在今天是如此普遍，以至于你可能在 ...



### EXPLORE FURTHER

- |                                   |                    |
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| 知 Machine Learning: 十大机器学习算法 - 知乎 | zhuanlan.zhihu.com |
| .. 一文看懂机器学习「3种学习方法+7个实操步骤+15种 ... | easyai.tech        |
| 知 如何自学机器学习Machine Learning? - 知乎  | zhihu.com          |

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## What is Machine Learning? - Techdigipro

<https://techdigipro.com/machine-learning/what-is-machine-learning> ▼

Dec 07, 2022 · To learn ML basic you need to start with a basic programming language like **python**, **c++**, R and after that you need to about calculus, probability, linear algebra, statistics ...

## 机器学习 – machine learning | ML

<https://easyai.tech/ai-definition/machine-learning> ▼

Aug 15, 2022 · 机器学习 (**Machine Learning**, ML)是一门多领域交叉学科，涉及概率论、统计学、逼近论、凸分析、算法复杂度理论等多门学科。专门研究计算机怎样模拟或实现人类的学习行 ...

# The site operator

- Sometimes, you want to confine your search results in a specific site or domain. This is the site operator that helps here
- Example: machine learning site:nature.com

machine learning site:nature.com

ALL IMAGES VIDEOS

About 172,000,000 results Any time ▾

**Machine learning | Nature**

<https://www.nature.com/subjects/machine-learning/nature>

Mar 09, 2022 · **Machine learning** | Nature **Machine learning** Article | 09 March 2022 The evolution, evolvability and engineering of gene regulatory DNA A framework for studying and engineering gene regulatory...

EXPLORE FURTHER

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- Nature Machine Intelligence** nature.com
- Journal Metrics | Nature Machine Intelligence nature.com
- Phys.org - **Nature Machine Intelligence** phys.org
- TPAMI** Information for Authors | IEEE Journals & Magazine | I... ieeexplore.ieee.org

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**Machine learning - Latest research and news | Nature**

<https://www.nature.com/subjects/machine-learning>

Dec 12, 2022 · **Machine learning** is the ability of a **machine** to improve its performance based on previous results. **Machine learning** methods enable computers to learn without being explicitly ...

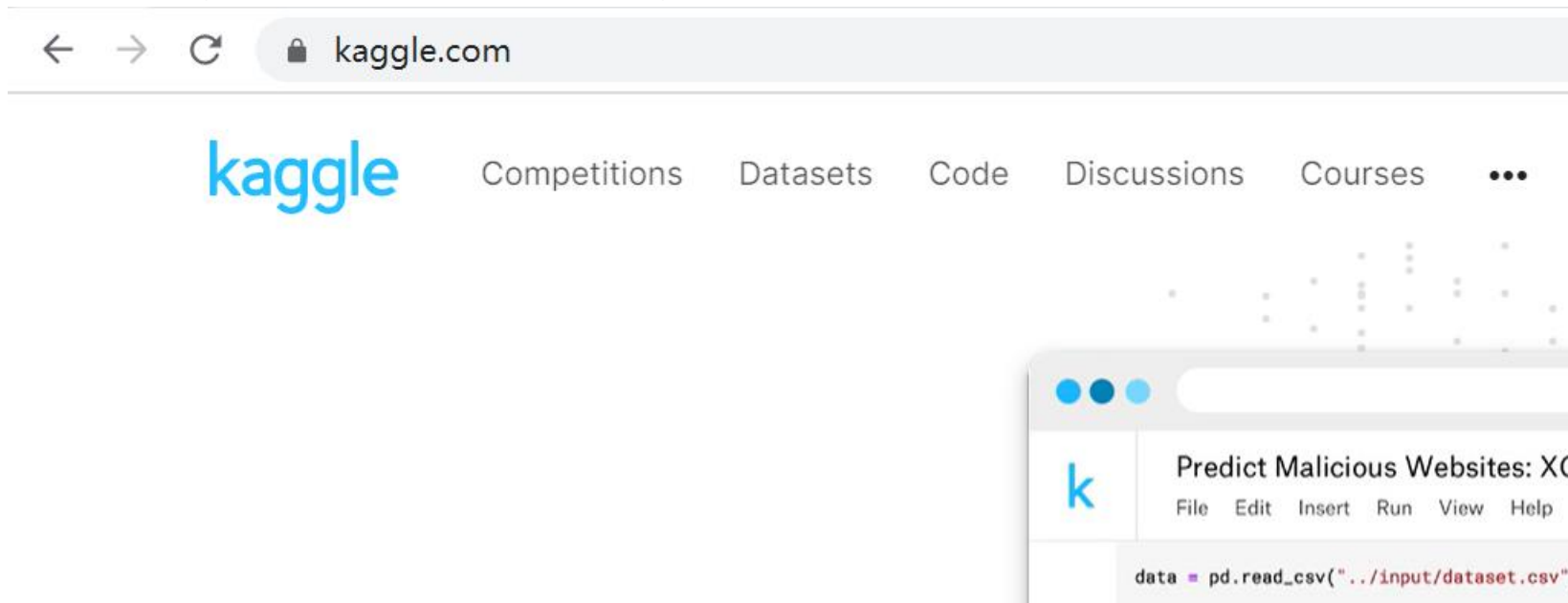
# The Academic/Scholar Channel

- ▶ Most searching engine provides the academic/scholar product or channel, which concentrates profiles of scholars and papers published on academic journals.
- ▶ Instead of aggregating casual information from various resources which might be provided by individuals without rigorous cross-check, usually information from academic channel is more trustworthy.
- ▶ One is encouraged to search terminologies, open-accessed papers for reference from the Academic/Scholar channel.



# Resource-aggregated Websites

- ▶ An extended topic is to search specific type of resource in specific channel or websites which aggregates resource of the same type.
- ▶ For example, Kaggle.com is well-known for its tremendously large host of different kinds of datasets for academic research or industrial application. Some datasets are well-recognized which can be used as the test-bench.
- ▶ To harness these resources for daily teaching and research is a demonstration of the cultivation of digital skills in such a digital era.





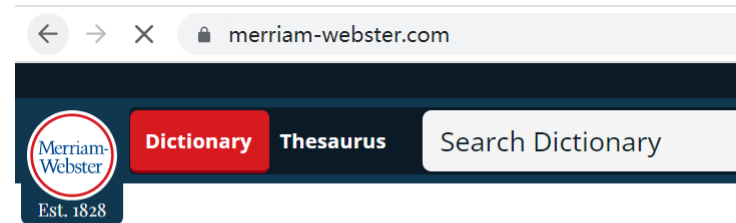
# Resource-aggregated Websites

- ▶ Furthermore, if you are doing engineering subjects such as computer science, arXiv is definitely the website you will not miss.
- ▶ arXiv is an open-access repository of electronic preprints and postprints approved for posting after moderation without peer review. It consists of scientific papers can be accessed online across various research fields. In many fields, scientific papers are inclined to be self-archived on the arXiv repository before publication in a peer-reviewed journal. Some publishers also grant permission for authors to archive the peer-reviewed postprint.
- ▶ Although some papers are less well-crafted and more draft-oriented, usually there is no big difference of ideas, methodologies from the formal published one. This advantage of early and free access help scholars embark on inspiring research as quick as possible.
- ▶ Arxiv also motivates similar services such as bioRxiv.

arXiv.org

# Online Dictionaries

- ▶ A quick way to master English is to learn English via English.
- ▶ Learning English via English means you will not try to seek the explanation of an unfamiliar word encountered first time. You will directly interpret it by a rephrasing using more plain words.
- ▶ There are several high quality online English dictionaries which can help in this regard, for example:
  - ▶ <https://dictionary.cambridge.org/>
  - ▶ <https://www.merriam-webster.com/>



# Online Dictionaries

- ▶ A criteria for a readable and beautiful essay is the variation of words of similar meanings. For example, to describe a trend or pattern that goes up, you can choose between the verbs: climb, go up, grow, increase, jump, rise and rocket, etc.
- ▶ A trick to do this is to use the word plus synonym as keywords to let the search engine give the recommendation. For example, to describe a trend or pattern that goes down, we use decrease as an hint to find the candidate synonyms:

The screenshot shows a search engine interface with the query 'decrease synonym' in the top bar. Below the search bar are tabs for 'ALL', 'IMAGES', and 'VIDEOS', with 'ALL' selected. The search results show 'About 101,000,000 results' and a filter for 'Any time'. The main content area is titled 'Dictionary' and 'Data from Oxford Languages'. The word 'de·crease' is displayed in large font, followed by its part of speech 'VERB' and phonetic transcription '[dəˈkrēs]' with a speaker icon. A definition is provided: '1. make or become smaller or fewer in size, amount, intensity, or degree: "the population of the area has decreased radically" · "in some cases vitamin E has decreased cholesterol levels"'. Below the definition, a section titled 'SIMILAR:' lists numerous synonyms in rounded rectangular buttons, arranged in five rows: lessen, grow/become less, grow/become smaller, reduce, drop; diminish, decline, dwindle, contract, shrink, fall off, die down, abate; subside, let up, tail off, ebb, wane, taper off, peter out, lighten, sink; slump, plummet, plunge, fall off a cliff, make less/fewer, lower; cut down/back (on), cut, curtail, narrow, pare down, slim down, tone down; temper, weaken, deplete, minimize, and an upward arrow icon.

decrease synonym

ALL IMAGES VIDEOS

About 101,000,000 results Any time ▾

Dictionary Data from Oxford Languages

de·crease

VERB [dəˈkrēs] 🔊

1. make or become smaller or fewer in size, amount, intensity, or degree:  
"the population of the area has decreased radically" · "in some cases vitamin E has decreased cholesterol levels"

**SIMILAR:** lessen grow/become less grow/become smaller reduce drop

diminish decline dwindle contract shrink fall off die down abate

subside let up tail off ebb wane taper off peter out lighten sink

slump plummet plunge fall off a cliff make less/fewer lower

cut down/back (on) cut curtail narrow pare down slim down tone down

temper weaken deplete minimize ^