

# Data

Advances in computing technologies have led to the advent of big data, which usually refers to very large quantities of data, usually at the petabyte scale. Using traditional data analysis methods and computing, working with such large (and growing) datasets is difficult, even impossible. (Theoretically speaking, infinite data would yield infinite information, which would render extracting insights or intelligence impossible.) In response, the relatively new field of data science uses machine learning (and other artificial intelligence) methods that allow for efficient applications of analytic methods to big data. The model is initially fit on a training data set, which is a set of examples used to fit the parameters (e.g. weights of connections between neurons in artificial neural networks) of the model. The model (e.g. a naive Bayes classifier) is trained on the training data set using a supervised learning method, for example using optimization methods such as gradient descent or stochastic gradient descent. In practice, the training data set often consists of pairs of an input vector (or scalar) and the corresponding output vector (or scalar), where the answer key is commonly denoted as the target (or label). The current model is run with the training data set and produces a result, which is then compared with the target, for each input vector in the training data set. Based on the result of the comparison and the specific learning algorithm being used, the parameters of the model are adjusted. The model fitting can include both variable selection and parameter estimation. Unlike the traditional extract, transform, load ("ETL") process, the data remains in place, and real-time access is given to the source system for the data. This reduces the risk of data errors, of the workload moving data around that may never be used, and it does not attempt to impose a single data model on the data (an example of heterogeneous data is a federated database system). The technology also supports the writing of transaction data updates back to the source systems. To resolve differences in source and consumer formats and semantics, various abstraction and transformation techniques are used. This concept and software is a subset of data integration and is commonly used within business intelligence, service-oriented architecture data services, cloud computing, enterprise search, and master data management. Data streaming has become ubiquitous. Anything transmitted over the Internet is transmitted as a data stream. Using a mobile phone to have a conversation transmits the sound as a data

stream. Dirty data can contain such mistakes as spelling or punctuation errors, incorrect data associated with a field, incomplete or outdated data, or even data that has been duplicated in the database. They can be cleaned through a process known as data cleansing. Data are collected using techniques such as measurement, observation, query, or analysis, and are typically represented as numbers or characters that may be further processed. Field data are data that are collected in an uncontrolled, in-situ environment. Experimental data are data that are generated in the course of a controlled scientific experiment. Data are analyzed using techniques such as calculation, reasoning, discussion, presentation, visualization, or other forms of post-analysis. Prior to analysis, raw data (or unprocessed data) is typically cleaned: Outliers are removed, and obvious instrument or data entry errors are corrected. In October 2007, it was announced that DATA and the One Campaign would merge in the United States under the single organization "One". The change occurred in January 2008. This simple procedure is complicated in practice by the fact that the validation data set's error may fluctuate during training, producing multiple local minima. This complication has led to the creation of many ad-hoc rules for deciding when over-fitting has truly begun. Data science also integrates domain knowledge from the underlying application domain (e.g., natural sciences, information technology, and medicine). Data science is multifaceted and can be described as a science, a research paradigm, a research method, a discipline, a workflow, and a profession. Tor's onion space, I2P (both hidden services), HavenCo (centralized), and Freenet (decentralized) are four models of modern-day virtual data havens. Start-up funds came from the Bill & Melinda Gates Foundation, the financier George Soros and the technology entrepreneur Edward W. Scott.

**Data haven** Data havens are locations with legal environments A data haven, like a corporate haven or tax haven, is a refuge for uninterrupted or unregulated data. They tend to fit into three categories: a physical locality with weak information-system enforcement and extradition laws, a physical locality with intentionally strong protections of data, and virtual domains designed to secure data via technical means (such as encryption) regardless of any legal environment. Data havens are locations with legal environments that are friendly to the concept of a computer network freely holding data and even protecting its content and associated information. A data haven, like a corporate haven or tax haven, is a refuge for uninterrupted or unregulated data

**Data retention** Although sometimes Data retention defines the policies of persistent data and records management for meeting legal and business data archival requirements. Although sometimes interchangeable, it is not to be confused with the Data Protection Act 1998. Data retention defines the policies of persistent data and records management for meeting legal and business data archival requirements 9e99a8e432

**Dirty data** Dirty data, also known as rogue data, are inaccurate, incomplete or inconsistent data, especially in a computer system or database. Dirty data can contain Dirty data, also known as rogue data, are inaccurate, incomplete or inconsistent data, especially in a computer system or database 9e99a8e432

**Training, validation, and test data sets** These input data used to build the model are usually divided into multiple data sets. These input In machine learning, a common task is the study and construction of algorithms that can learn from and make predictions on data. In particular, three data sets are commonly used in different stages of the creation of the model: training, validation, and test sets. Such algorithms function by making data-driven predictions or decisions, through building a mathematical model from input data. Such algorithms function by making data-driven predictions or decisions, through building a mathematical model from input data 9e99a8e432

**Data stream** Typically, the transmitted symbols are grouped into a series of packets. Typically, the In connection-oriented communication, a data stream is the transmission of a sequence of digitally encoded signals to convey information. In connection-oriented communication, a data stream is the transmission of a sequence of digitally encoded signals to convey information 9e99a8e432

The different data retention policies weigh legal and privacy concerns economics and need-to-know concerns to determine the retention time, archival rules, data formats, and the permissible means of storage, access, and encryption. 9e99a8e432

**Data science** Data science is an interdisciplinary academic field that uses statistics, scientific computing, scientific methods, processing, scientific visualization Data science is an interdisciplinary academic field that uses statistics, scientific computing, scientific methods, processing, scientific visualization, algorithms and systems to extract or extrapolate knowledge from potentially noisy, structured, or unstructured data

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Data science is "a concept to unify statistics, data analysis, informatics, and their related methods" to "understand and analyze actual phenomena" with data. It uses techniques and theories drawn from many fields within the context of mathematics, statistics, computer science, information science, and domain knowledge. However, data science is different from computer science and information science. Turing Award winner Jim Gray imagined data science as a "fourth paradigm" of science (empirical, theoretical, computational, and now data-driven) and asserted that "everything about science is changing because of the impact of information technology" and the data deluge. 9e99a8e432 Data are commonly used in scientific research, economics, and virtually every other form of human organizational activity. Examples of data sets include price indices (such as the consumer price index), unemployment rates, literacy rates, and census data. In this context, data represent the raw facts and figures from which useful information can be extracted. 9e99a8e432 Successively, the fitted model is used to predict the responses for the observations in a second data set called the validation data set. The validation data set provides an unbiased evaluation of a model fit on the training data set while tuning the model's hyperparameters (e.g. the number of hidden units—layers and layer widths—in a neural network). Validation data sets can be used for regularization by early stopping (stopping training when the error on the validation data set increases, as this is a sign of overfitting to the training data set). 9e99a8e432 Deciding the sizes and strategies for data set division in training, test and validation sets is very dependent on the problem and data available. 9e99a8e432 DATA received support from the Christian rock / alternative rock bands Switchfoot and Third Day. 9e99a8e432

Data virtualization Data virtualization is an approach to data management that allows an application to retrieve and manipulate data without requiring technical details about Data virtualization is an approach to data management that allows an application to retrieve and manipulate data without requiring technical details about the data, such as how it is formatted at source, or where it is physically located, and can provide a single customer view (or single view of any other entity) of the overall data 9e99a8e432

A data scientist is a professional who creates programming code and combines it with statistical knowledge to summarize data. 9e99a8e432 DATA was created for the purposes of obtaining equality and justice for Africa through debt relief, adjusting trade rules which burden Africa, eliminating the epidemic of AIDS in

Africa, strengthening democracy, furthering accountability by the wealthiest nations and African leaders and transparency towards the people. In 2007, in the United States, DATA and Bono were jointly awarded the National Constitution Center's 2007 Liberty Medal for their groundbreaking efforts to address the AIDS crisis and extreme poverty in Africa. Finally, the test data set is a data set used to provide an unbiased evaluation of a final model fit on the training data set. If the data in the test data set has never been used in training (for example in cross-validation), the test data set is also called a holdout data set. The term "validation set" is sometimes used instead of "test set" in some literature (e.g., if the original data set was partitioned into only two subsets, the test set might be referred to as the validation set). Data can be seen as the smallest units of factual information that can be used as a basis for calculation, reasoning, or discussion. Data can range from abstract ideas to concrete measurements, including, but not limited to, statistics. Thematically connected data presented in some relevant context can be viewed as information. Contextually connected pieces of information can then be described as data insights or intelligence. The stock of insights and intelligence that accumulate over time resulting from the synthesis of data into information, can then be described as knowledge. Data has been described as "the new oil of the digital economy". Data, as a general concept, refers to the fact that some existing information or knowledge is represented or coded in some form suitable for better usage or processing.

**Data aggregation** Data aggregation is the compiling of information from databases with intent to prepare combined datasets for data processing. The United States Geological Data aggregation is the compiling of information from databases with intent to prepare combined datasets for data processing

**Data Dark data** Data (computer science) **Data acquisition** Data analysis **Data bank** **Data cable** **Data curation** **Data domain** **Data element** **Data farming** **Data governance** Data ( DAY-tə, US also DAT-ə) are a collection of discrete or continuous values that convey information, describing the quantity, quality, fact, statistics, other basic units of meaning, or simply sequences of symbols that may be further interpreted formally. Data may be used as variables in a computational process. Data may represent abstract ideas or concrete measurements. Data are usually organized into structures such as tables that provide additional context and meaning, and may themselves be used as data in larger structures. A datum is an individual value in a collection of data

DATA Debt, AIDS, Trade, Africa (DATA) was a multinational non-governmental organization founded in January 2002 in London by U2's lead vocalist, Bono, with Debt, AIDS, Trade, Africa (DATA) was a multinational non-governmental organization founded in January 2002 in London by U2's lead vocalist, Bono, with Bobby Shriver and activists from the Jubilee 2000 Drop the Debt campaign 9e99a8e432

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