

# Active learning for hierarchical text classification

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## Active Learning Machine Learning for Text Classification

### What is Text Classification?

Text classification is a machine learning technique that assigns predefined labels or categories to text documents based on their content. It categorizes texts into various topics, themes, or sentiments (e.g., news, business, positive/negative).

### What is Active Learning Machine Learning for Text Classification?

Active learning is a machine learning paradigm where the model actively seeks new data to learn from. In text classification, active learning approaches can be used to identify and annotate unlabeled text data, which is then used to improve the model's performance.

### What is Hierarchical Classification?

Hierarchical classification is a type of classification where data is organized into a hierarchical structure. In this structure, categories are organized into broader and narrower subcategories, creating a tree-like structure.

### What is Hierarchical Text Classification?

Hierarchical text classification combines text classification with hierarchical organization. It assigns multiple labels to texts, representing their position within the

hierarchy. For example, a news article could be classified as "News" and also as "Business" or "Technology."

## **Machine Learning Algorithms for Text Classification**

Various machine learning algorithms can be used for text classification, including:

- Naive Bayes
- Support Vector Machines (SVM)
- Decision Trees
- Random Forests
- Deep Learning Networks

## **Example of Active Learning for Text Classification**

An active learning system for text classification could start with a small set of labeled data. The model would then identify unlabeled texts that are most likely to improve the model's performance. These texts would be manually annotated and added to the training set, iteratively improving the model's accuracy.

## **Levels of Hierarchical Classification**

The seven levels of hierarchical classification are:

1. Domain
2. Division
3. Class
4. Order
5. Family
6. Genus
7. Species

## **Example of Hierarchical Classification**

In the animal kingdom, the following classification follows a hierarchical structure:

- Domain: Eukaryota

- Kingdom: Animalia
- Phylum: Chordata
- Class: Mammalia
- Order: Carnivora
- Family: Felidae
- Genus: Panthera
- Species: Panthera leo (Lion)

## Learning Hierarchy of Classification

The hierarchy of classification can be learned through:

- **Observation:** Studying relationships between objects and their characteristics.
- **Taxonomic Keys:** Using predefined rules or keys to identify organisms or objects.
- **Machine Learning:** Algorithms that automatically discover hierarchical structures within data.

## Hierarchical Method of Classification

Hierarchical methods of classification use a top-down approach, starting from the broadest category and progressively narrowing down to more specific subcategories.

## Hierarchical Clustering for Text Classification

Hierarchical clustering is a technique for creating a hierarchical structure of text documents based on their similarity. It can be used as a preprocessing step for machine learning models, such as text classifiers.

## Text Classification Example

An example of text classification could be categorizing news articles into topics, such as:

- Business

- Technology
- Entertainment
- Sports

## Learning Text Classification

Text classification can be learned through:

- **Tutorials and Books:** Online courses, books, and tutorials provide theoretical knowledge and practical examples.
- **Hands-on Projects:** Build machine learning models for text classification using programming languages such as Python or R.
- **Experimentation:** Experiment with different algorithms, text preprocessing methods, and evaluation metrics to optimize model performance.

## Categories of Classification Text

The three categories of classification text are:

- **Single-label Classification:** Assigning a single label to a text.
- **Multi-label Classification:** Assigning multiple labels to a text.
- **Hierarchical Classification:** Assigning multiple labels organized in a hierarchical structure.

## Best Architecture for Text Classification

The best architecture for text classification depends on the specific task and available resources. Common architectures include:

- Bag-of-Words
- TF-IDF
- Word Embeddings
- Convolutional Neural Networks (CNN)

## Machine Learning for Text Classification

Machine learning for text classification involves using algorithms to learn patterns and relationships within text data. It enables computers to automatically classify texts into predefined categories or labels.

### **Difference Between Machine Learning and Active Learning**

Machine learning algorithms learn from labeled data, while active learning algorithms actively seek new data to improve the model's performance.

### **Types of Classification in Machine Learning**

The two main types of classification in machine learning are:

- **Binary Classification:** Assigning one of two labels to data points.
- **Multi-class Classification:** Assigning one of multiple labels to data points.

### **Text-Based Machine Learning**

Text-based machine learning refers to machine learning techniques applied to text data, including text classification, text summarization, and language generation.

**What is check\_mk in Nagios?** Check\_mk and its role in Nagios check\_mk is a data plugin that replaces NRPE, NSClient, check SNMP, and other data plugins. It uses a completely new technique of gathering data from hosts and network components that is both fast and simple to configure – especially in big monitoring situations.

**What is Nagios monitoring?** Nagios is an Open Source IT system monitoring tool. It was designed to run on the Linux operating system and can monitor devices running Linux, Windows and Unix OSes. Nagios software runs periodic checks on critical parameters of application, network and server resources.

**What is the Checkmk monitoring tool?** Checkmk enables ITOps and DevOps teams to run your IT at peak performance. The heart of the Checkmk platform is the High Performance Core, designed to scale up to millions of services monitored while still retaining a small footprint.

**What is the difference between Checkmk raw and Nagios Core?** However, Checkmk offers more advanced notification options, including flexible escalation

chains, acknowledgement handling, and customizable notification templates. Nagios, on the other hand, has a more basic notification system that may require additional customization to meet specific requirements.

**Is Nagios obsolete?** By now, the code base and the architecture of Nagios are outdated and no longer state-of-the-art. Working with Nagios-Config-Files has always been uncomfortable, but today it is particularly backward.

**What is the meaning of Checkmk?** August 2022) Checkmk is a software system developed in Python and C++ for IT Infrastructure monitoring. It is used for the monitoring of servers, applications, networks, cloud infrastructures (public, private, hybrid), containers, storage, databases and environment sensors.

**Which check is the most commonly used method for monitoring in Nagios?** Active checks are the most common method for monitoring hosts and services. The main features of active checks are as follows: Active checks are initiated by the Nagios Core process. Active checks are run on a regularly scheduled basis.

**Why not to use Nagios?** Poorly scalable and flexible Nagios is not intended for changing environments. Its configuration is static, cumbersome and complicated to integrate into automatic provisioning processes. As it is well known, scalability is not Nagios' strong point.

**Is Nagios used for continuous monitoring?** Nagios is used for continuous monitoring of system applications, services, and business processes, etc in a DevOps culture. Nagios runs on a server, usually as a daemon or a service.

**Who uses Checkmk?**

**Does Checkmk require an agent?** Since most of the interfaces are not actually accessible via the network, the installation of a monitoring agent is required. That is why Checkmk has its own agent for monitoring Linux.

**What database does Checkmk use?** Checkmk is a comprehensive and simple-to-configure tool used to monitor any version of MySQL/MariaDB databases running on Linux and Windows.

**How to use Nagios for monitoring?**

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**What's better than Nagios?** For everyone who is looking for a powerful and easy-to-use monitoring software, PRTG Network monitor and PRTG Enterprise Monitor as on-premises network monitoring tools or PRTG Hosted Monitor as Paessler's cloud-based version of PRTG is an excellent choice and more than just an alternative to Nagios.

**When to use Nagios?** Nagios allows you to detect and repair problems and mitigate future issues before they affect end users and customers. By Using Nagios, You Can: Plan for infrastructure upgrades before outdated systems cause failures. Respond to issues at the first sign of a problem.

**What is the drawback of Nagios?** A Nagios implementation requires time-consuming configuration efforts to get the product to the point where it can return tangible insights, and if you don't have an expert on staff, the learning curve to understand the intricacies of the solution can be quite steep.

**What is the new name for Nagios?** Nagios is renamed Nagios Core.

**Which is better Nagios or Prometheus?** Prometheus provides graphs and dashboards, but users often use additional visualization tools like Grafana to display metrics effectively. Nagios has dashboards designed to monitor networks and infrastructure components but lacks graphs for more application-related issues.

**What can I monitor with Checkmk?** Checkmk not only monitors all network interfaces in an IT infrastructure but also the bandwidth consumption at each port. Bandwidth network monitoring with Checkmk enables you to: Monitor all ports and the bandwidth usage for each port.

**What is the interval for Checkmk monitoring?** The one-minute-interval and the rule "Normal check interval for service checks" to change it is for active checks only. Simply speaking, the active checks are those that actively fetch data from a host, such as calling the checkmk agent or running some SNMP request against a host.

**Who is the founder of Checkmk?** Checkmk founder Mathias Kettner no longer saw this as a given with a package of several optional monitoring tools, so he concentrated on the further development of Checkmk. In this way, he wanted to ensure that Checkmk would provide a finely-tuned monitoring system.

**Can Nagios accept checks passively?** Unlike with active host checks, Nagios does not (by default) attempt to determine whether or host is DOWN or UNREACHABLE with passive checks. Rather, Nagios takes the passive check result to be the actual state the host is in and doesn't try to determine the host's actual state using the reachability logic.

**What is checks in Nagios?** When Nagios Core checks the status of services, it will be able to detect when a service changes between OK, WARNING, UNKNOWN, and CRITICAL states and take appropriate action. These state changes result in different state types (HARD or SOFT), which can trigger event handlers to be run and notifications to be sent out.

**How does Nagios check host status?** Hosts are checked by the Nagios daemon: At regular intervals, as defined by the check\_interval and retry\_interval options in your host definitions. On-demand when a service associated with the host changes state. On-demand as needed as part of the host reachability logic.

**Is Nagios still free?** We offer plans ranging from 50 Nodes to unlimited Nodes and many options in between, as well as a free option which is great for home setups, trialing the product, or students in the IT field who want to learn using XI.

**Is IT hard to learn Nagios?** Nagios is difficult to learn, but once you have done that, I would imagine it is easy and powerful. I needed a system in quickly, and PRTG fitted the bill perfectly.

**What is the best Linux for Nagios?** Re: What is the best OS to support Nagios Core? We officially support and recommend CentOS and RHEL, versions 5+. You should note that XI will not run on Ubuntu though core will run just fine. It will also run on these distros.

**How to check memory usage in Nagios?** Check\_Memory.py. >>> This Script checks Your Unix Memory Utilization & Returns Output >>> Use Command Line Arguments in MB [Megabytes] >>> Use script as ./memory.py 'Warning Limit' 'Critical Limit' >>> Use script as ./memory.py 600 500 >>> Where Argument 600 i ...

**Is Checkmk open source?** Checkmk has been available as an open source project since 2007. More than 30 full-time developers work daily on improving Checkmk.



**How to check CPU utilization in Nagios?** check\_cpu.sh is a Nagios plugin to monitor CPU utilization. It makes use of /proc/stat and calculates it through Jiffies rather than using another frontend tool like iostat or top. When using optional warning/critical thresholds all values except idle are aggregated and compared to the thresholds.

**What are Nagios commands?** Commands include service checks, service notifications, service event handlers, host checks, host notifications, and host event handlers. Command definitions for Nagios are defined in commands.cfg file.

**How do I monitor memory usage?**

**How do I check my memory capacity?** Locate the Computer icon in the Start menu. Right-click the Computer icon and select Properties from the menu. Under System and beneath the processor model, you can see the installed memory amount, measured in MB (megabytes) or GB (gigabytes).

**What is the fastest way to check how much memory is installed?**

**Is Checkmk free to use?** You can also continue using Checkmk Cloud in Free mode for as long as you want. Free mode does not require a license and is limited to 750 services and one site. What can I do in the trial of Checkmk Cloud ? The trial is a full-fledged and unlimited version of Checkmk Cloud.

**Who uses Checkmk?**

**Which monitoring tool is best?**

**How do I check system utilization?** Using the Task Manager: Open the Task Manager (Ctrl + Shift + Esc) and go to the "Performance" tab. The CPU usage will display as a graph; if the computer runs high CPU usage, the chart will be primarily red.

**What is the top command to check CPU utilization?** Use the "top" command in conjunction with "ps" for real-time monitoring. Open a terminal and run: The "top" command provides an interactive interface that continuously updates information about system processes, including CPU utilization. It displays the most CPU-

intensive processes at the top of the list.

**How to check all CPU utilization in Linux?** Check how the CPU is being used with the htop command. This command prints out real-time information, including tasks, threads, load average uptime and usage for each CPU. To run this tool, issue the command htop. A real-time display appears with information on how the CPU is being put to use.

**How to use Nagios for monitoring?**

**Why not to use Nagios?** Poorly scalable and flexible Nagios is not intended for changing environments. Its configuration is static, cumbersome and complicated to integrate into automatic provisioning processes. As it is well known, scalability is not Nagios' strong point.

**What language does Nagios use?** While the front-end of Nagios Core is mainly CGI with some PHP, most of the Nagios XI front-end and back-end are written in PHP including the subsystem, event handlers, and notifications, and Python is used to create capacity planning reports and other reports.

**What is the full form of J2EE in Java interview questions?** J2EE, which stands for Java 2 Enterprise Edition, is a set of frameworks, an assortment of APIs, and numerous J2EE technologies (JSP, Servlets, etc.) that are used as standards for streamlining the creation of large-scale applications.

**What do you understand by the J2EE module?** A J2EE module is a collection of one or more J2EE components of the same container type (for example, web or EJB) with deployment descriptors of that type. One descriptor is J2EE standard, the other is Application Server specific.

**What comes under J2EE?** The J2EE application model divides enterprise applications into three fundamental parts: components, containers, and connectors. Components are the key focus of application developers, while system vendors implement containers and connectors to conceal complexity and promote portability.

**What is the full form of J2EE in Javatpoint?** J2EE stands for Java 2 Enterprise Edition. The functionality of J2EE is developing and deploying multi-tier web-based enterprise applications.

**Is J2EE backend or front end?** J2EE, a Java backend technology, is the defacto enterprise standard for software or application development. This technology is the most popular programming language in the world and goes through continuous upgrades.

**What is the difference between JDK and J2EE?** JDK: stands for Java Development Kit can be known as the most basic of Java, used to develop client side application (such as desktop application (use Swing, awt, ...) or Applet,...) J2EE: stands for Java Enterprise Edition used to develop application on Server side (such as Servlet, EJB,...)

**What are the four components of J2EE application?**

**What is the difference between Java Core Java and J2EE?** The J2SE (Java Standard Edition) falls under Core Java. The J2EE (Java Enterprise Edition) falls under Advanced Java. You cannot create or develop an advanced java app without using Core Java. It is a prerequisite for developing all the advanced Java applications.

**What is an example for J2EE?** For example, to access an Oracle database, you need the Oracle JDBC driver, and to access a MySQL database, you need the MySQL connector/J driver. You cannot build desktop applications using J2EE APIs; they only run in application servers and communicate with backend J2EE services (application servers).

**What is the new name of J2EE?** History. The platform was known as Java 2 Platform, Enterprise Edition or J2EE from version 1.2, until the name was changed to Java Platform, Enterprise Edition or Java EE in version 1.5. Java EE was maintained by Oracle under the Java Community Process.

**What is framework in J2EE?** J2EE is a set of specifications, which define the standard for developing multi-tier enterprise applications with Java. The J2EE platform provides a complete framework for design, development, assembly, and deployment of Java applications built on multi-tiered distributed application model.

**What are J2EE patterns?** J2EE design patterns are proven and reusable solutions to common problems encountered in enterprise-level Java development. They

provide a structured approach to designing software systems, promoting best practices for scalability, maintainability, and efficiency in Java Enterprise Edition (J2EE) applications.

**What is the full form of XML in J2EE?** Extensible Markup Language (XML) is a markup language used to describe the content and structure of data in a document. It is a simplified version of Standard Generalized Markup Language (SGML).

**What is the full form of URL in J2EE?** URL is the abbreviation of Uniform Resource Locator. It is the resource address on the internet. The URL (Uniform Resource Locator) is created by Tim Berners-Lee and the Internet Engineering working group in 1994.

**What is the J2EE syllabus?** The following focus areas are included in this course: Module 1: Introduction to J2EE. Module 2: Introduction to Servlets. Module 3: Session Management. Module 4: Redirection and forwarding Handling Errors and Exceptions in Servlets.

**What is J2EE and JSP?** JSP and Servlets is Java for the web. J2EE is the name of one of the Java Platforms (Enterprise Edition). There is also the Standard Edition. You choose one - and then you write your Java code using it.

**What is Java EE vs J2EE?** Java Vs J2EE: Terminology A programming language developed by Sun Microsystems, it derives most of its syntax from C and C++ with fewer dependencies. J2EE, originally known as Java Enterprise Edition (Java EE), is a collection of APIs owned by Oracle Corporation to create server-side enterprise applications.

**What is the full form of JDBC in J2EE?** Java Database Connectivity (JDBC) is an application programming interface (API) for the Java programming language which defines how a client may access a database.

**What is the difference between Java Core Java and J2EE?** The J2SE (Java Standard Edition) falls under Core Java. The J2EE (Java Enterprise Edition) falls under Advanced Java. You cannot create or develop an advanced java app without using Core Java. It is a prerequisite for developing all the advanced Java applications.

**Which substances diffuse through the membrane lab?** Cell membranes allow small molecules such as oxygen, water carbon dioxide and glucose to pass through, but do not allow larger molecules like sucrose, proteins and starch to enter the cell directly.

**How will you know whether starch has diffused across the membrane in part A?** To test whether iodine or starch have crossed the synthetic membrane, you will look for a change in color. A solution of iodine is tan and a solution of starch is clear or milky white; when iodine and starch are together in the same solution, the solution is purple, dark blue or black.

**What are the results of diffusion through a membrane?** Generally water will diffuse across a membrane, resulting in equal concentrations of water on both sides. If the cytoplasm of a cell is 95% water, the remaining 5% is dissolved materials (solute).

**What is the best explanation for the color change that occurs inside the cell?**  
1. What is the best explanation for the color change that occurred inside the "cell?" Some Lugol's Iodine diffused through the "membrane" and into the "cell." Recognizing the starch in the "cell", it turned a blue-black color to indicate its presence. any starch diffused out.

**Which substances diffuse through the membrane?** Thus, gases (such as O<sub>2</sub> and CO<sub>2</sub>), hydrophobic molecules (such as benzene), and small polar but uncharged molecules (such as H<sub>2</sub>O and ethanol) are able to diffuse across the plasma membrane. Other biological molecules, however, are unable to dissolve in the hydrophobic interior of the phospholipid bilayer.

**What is diffusion through a membrane lab osmosis?** The net diffusion of water through a selectively permeable membrane from the side of high water concentration to the side of low water concentration is termed osmosis. The higher the concentration of solute (dissolved particles), the lower the concentration of free water molecules.

**Can glucose and starch diffuse through a membrane?** Starch does not pass through the synthetic selectively permeable membrane because starch molecules

are too large to fit through the pores of the dialysis tubing. In contrast, glucose, iodine, and water molecules are small enough to pass through the membrane.

**How does diffusion across the cell membrane occur in detail?** Simple passive diffusion occurs when small molecules pass through the lipid bilayer of a cell membrane. Facilitated diffusion depends on carrier proteins imbedded in the membrane to allow specific substances to pass through, that might not be able to diffuse through the cell membrane.

**Which substance did not diffuse through the membrane?** 5. Which substance(s) did not diffuse through the membrane? Starch did not diffuse through the membrane.

**What is an example of diffusion across a membrane?** In a cell, water, oxygen and carbon dioxide molecules can pass directly through the cell membrane without requiring any energy along the concentration gradient. This is a form of simple diffusion.

**What is diffusion in short answer?** 1. What is diffusion? Diffusion is the movement of molecules from a region of higher concentration to a region of lower concentration down the concentration gradient.

**What factors affect diffusion across the membrane?** The rate of diffusion in cells is affected by factors such as temperature, concentration gradient, size of the molecule, and the presence of a membrane.

**How does volume affect diffusion?** Answer and Explanation: There is a relationship between the surface area to volume ratio with the rate of diffusion. The smaller the surface area of an organism in relation to its volume, the lower the rate of diffusion. The ratio of surface area to volume of an object decreases sharply with the increase in its size.

**Does cell size affect diffusion rate?** This has an effect on diffusion because it relies on the surface area of a cell: as a cell gets bigger, diffusion becomes less efficient. The solution to producing larger organisms is for them to become multicellular.

**How does surface area affect diffusion?** The greater the surface area, the faster the rate of diffusion. The greater the difference in concentration, the quicker the rate

of diffusion. The higher the temperature, the more kinetic energy the particles will have, so they will move and mix more quickly.

**What things can diffuse across the cell membrane?** Small nonpolar molecules, such as O<sub>2</sub> and CO<sub>2</sub>, are soluble in the lipid bilayer and therefore can readily cross cell membranes. Small uncharged polar molecules, such as H<sub>2</sub>O, also can diffuse through membranes, but larger uncharged polar molecules, such as glucose, cannot.

**What substances can diffuse across the blood vessel membranes?** The primary purpose of the cardiovascular system is to circulate gases, nutrients, wastes, and other substances to and from the cells of the body. Small molecules, such as gases, lipids, and lipid-soluble molecules, can diffuse directly through the membranes of the endothelial cells of the capillary wall.

**Which substances cross the dialysis membrane?** Starch does not pass through the synthetic selectively permeable membrane because starch molecules are too large to fit through the pores of the dialysis tubing. In contrast, glucose, iodine, and water molecules are small enough to pass through the membrane.

**Which of the following can diffuse through the cell membrane?** Cell membrane is selectively permeable. Small non polar molecules (oxygen, nitrogen, carbondioxide) can easily pass through the cell membrane. Uncharged polar molecules- small (water, ammonia, glycerol) and large (glucose, sucrose) can partially pass through the cell membrane.

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