Computing and A.I. Terminology

Version 1.2

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This handout serves as a quick reference guide to key terms and concepts in the world of AI and technology. Whether you're a tech-savvy scribe or a newcomer to the digital landscape, this glossary aims to provide you with a foundational understanding that will demystify the jargon and open doors to new tools. Please note that it's not necessary to memorize these terms, but it will be handy to have them on-hand as you venture forward.

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General Computer Terms

The stuff you wish actually came with the 'manual' for your computer, rather than a million warnings and legal jargon in five different languages that you'll never read.

1. **CPU (Central Processing Unit)**

   - **Definition**: The "brain" of the computer where most calculations are performed. Often referred to simply as a "processor". The two largest manufacturers of CPUs for traditional computers or laptops (as opposed to smartphones and tablets) are AMD and Intel.

   - **Relevance to AI**: Used for general-purpose computing tasks and can run basic AI models.

2. **GPU (Graphics Processing Unit)**

   - **Description**: Think of a GPU as a specialized "worker" inside your computer that's really good at handling visuals, like videos and graphics. But it's also great at doing lots of small calculations all at once, which is something AI often needs. Strong graphics cards are common in gaming and multimedia editing computers, though you can purchase them separately to upgrade an existing desktop computer.

   - **Relevance to Authors**: If you're using advanced writing tools powered by AI, a stronger GPU can make those tools run faster and more smoothly. It's also key if you're doing things like video editing or 3D design as part of your work.

   - **Note**: Laptop computers usually have their GPU chips 'baked' onto their main circuit board, so upgrading them is virtually impossible.

3. **RAM (Random Access Memory)**

   - **Description**: Think of RAM as your computer's "short-term memory." It temporarily holds information that your computer is actively using or processing. When you open a file or run a program, it's loaded into RAM for quick access.

   - **Relevance to Authors**: More RAM can make your computer faster, especially when you're juggling multiple tasks like writing in a word processor, browsing the web for research, and running other software. If you're using AI tools for text generation or editing, more RAM can make those tasks speedier and more efficient.

   - **Note**: Laptop computers usually have their RAM chips 'baked' onto their main circuit board, so upgrading them is virtually impossible.

4. **VRAM (Video Random Access Memory)**

- **Description**: VRAM is a special kind of memory that takes care of visuals and graphics on your computer screen. Unlike RAM, which is a jack-of-all-trades, VRAM is specialized for displaying images and videos.
- **Relevance to Authors**: If you're working on projects that involve a lot of graphics or videos — like designing book covers or creating promotional content — having more VRAM can be helpful. It's also important if you're using AI tools that require heavy visual processing.

5. **Storage (HDD, SSD)**

- **Definition**: Long-term data storage. HDD (Hard Disk Drive) is an older technology, slower, and incorporates moving parts (spinning magnetic disks), while SSD (Solid-State Drive) technology is faster, more durable (drop and shock resistant), and has no moving components. Whichever your computer uses, this is where files are stored when you save them.
- **Relevance to AI**: Storage capacity and speed can affect how efficiently you can work with large datasets, and how quickly your programs open when their data is copied to RAM.
- **Note**: There are two reasons HDDs are still in widespread use, despite the benefits of SSDs:
    1. SSDs are significantly more expensive in terms of dollars-per-gigabyte of storage.
    2. SSDs have yet to catch up to HDDs in terms of maximum storage space on a single device.

6. **Removable Storage**

- **Definition**: Long-term data storage you can remove from your computer. "Thumb drives", external hard drives, SD cards, and the like. Basically serves the same function as HDDs and SDDs, but tend to be much slower. The tradeoff for the sacrifice in speed is portability between devices.
- **Relevance to AI**: Knowing that removable storage is often significantly slower is important when deciding where to store locally-hosted AI models.

7. **Motherboard**

- **Definition**: The motherboard is the main circuit board inside a computer. It serves as the central hub that connects all the computer's components and handles communication between them, including the CPU, RAM, GPU, networking hardware, audio hardware, and storage devices.
- **Relevance to AI**: While you may not need to interact directly with the motherboard, understanding its role can help you better appreciate how your computer operates.

8. **Software**

- **Definition**: Programs that run on a computer, such as text editors, web browsers, etc.
- **Relevance to AI**: Different software tools can help you in various aspects of AI, from data gathering to analysis to deployment.

9. **Hardware**

- **Definition**: Hardware refers to the physical components of a computer system, such as the CPU, RAM, hard drive, and GPU. These are tangible items that make up the 'body' of the computer.

- **Relevance to AI**: Understanding what hardware helps in making informed decisions when purchasing a computer or upgrading your current system. What motherboard a computer has will dictate what types of CPU, RAM, GPU, and storage you can operate. If you've ever had that "Damn, my computer doesn't have that port!" moment, that is a result of choice of hardware.

10. **Operating System (OS)**

  - **Definition**: Software that controls the computer hardware and provides services for computer programs (e.g., Windows, macOS, Linux). Think of it as the main piece of software all your other software runs on top of.

  - **Relevance to AI**: The choice of OS can affect the software and tools available to an author. For example, the Pages word processor is only available on macOS. AI tools are no different, and some only support certain platforms.

11. **Network**

  - **Definition**: A group of interconnected computers that can communicate with each other. The Internet is a gigantic network, while your own stuff running behind your router at home is a 'local' network.

  - **Relevance to AI**: Networks are essential for cloud-based AI solutions and data sharing.

12. **Cloud Computing**

  - **Definition**: Storing and accessing data and programs over the Internet instead of on a physical computer.

  - **Relevance to AI**: Cloud services often offer specialized hardware and software solutions for AI tasks, making it easier to scale your projects.

13. **Server Hardware**

  - **Definition**: Server hardware refers to the physical machine that hosts data, applications, or services. While specialized server machines share many common attributes with personal computers, their hardware is generally more robust and expensive. However, standard personal computers can also function as servers for smaller tasks or home setups where few users are connecting.

  - **Relevance to Authors**: This term will frequently come up when exploring tools for running personal, private AI models locally.

  - **Note**: Most people in technical industries refer to server hardware or server software simply as 'server(s)', relying on context to know which one they are talking about. Keep this in mind when reading any articles or documentation, as it's a common point of confusion.

14. **Server Software**

  - **Definition**: Server software is a program that runs on server hardware to manage the network and its resources. It handles requests from client software on other computers and returns the appropriate data in its responses.

  - **Relevance to Authors**: Many locally-hosted AI tools operate through 'local servers' that run on your personal computer. It's important not to confuse these with server hardware or services hosted on external servers in the cloud.

  - **Note**: Most people in technical industries refer to server hardware or server software simply as 'server(s)', relying on context to know which one they are talking about. Keep this in mind when reading any articles or documentation, as it's a common point of confusion.

15. **Local Hosting**
    - **Definition**: Local hosting refers to running software or storing data on a user's own hardware, rather than on remote servers (commonly known as the cloud). In the context of AI, local hosting means running an AI model directly on your own computer.
    - **Relevance to Authors**: Understanding local hosting can be important for authors who are concerned about data privacy or who need to use AI tools without an internet connection. Locally-hosted models enable users to run AI tasks on their own machines, without the need to send data to external servers.

16. **I/O (Input/Output)**
    - **Definition**: Refers to the communication between a computer and the outside world. Inputs are data we feed into the computer. Outputs are what we get out.
    - **Relevance to AI**: Inputs and Outputs are foundational to using pretty much any piece of software, and AI tools are no exception.

17. **Source Code**
    - **Description**: The original instructions that software developers write to create a program. Think of it like the "blueprint" that gets turned into the finished software you use.
    - **Relevance to Authors**: Even if you never see source code, knowing what it is can help you choose between different writing and publishing tools. Whether the source code is open or closed can affect things like how much you can customize the tool, its cost, and the level of community support.

18. **Open Source Software**
    - **Definition**: Software that allows anyone to look at or change its "blueprints" (source code). It's often created by a community of volunteers.
    - **Relevance to Authors**: Open-source tools often let you tweak them more to your liking and are generally free. There are many open-source writing and publishing tools.
    - **Note**: Help for using these tools usually comes from online communities where people share advice and tips. The more people use the software, the better this community support usually is.

19. **Closed Source Software**
    - **Definition**: Software that keeps its "blueprints" (source code) a secret. You usually have to pay to use it.
    - **Relevance to Authors**: Closed-source software often includes customer support and regular updates. It's generally less customizable and more expensive than open-source options. Examples include the Adobe Creative Suite, Microsoft Office, Vellum, and Scrivener.
    - **Note**: Keep in mind that customer support for these tools may be outsourced or automated, which could affect the quality of help you get.

Text and Writing Related Terms

Terms that are specifically relevant to working with text in the context of AI.

1. **Markdown**

- **Definition**: Markdown is simple means of formatting text using plain text syntax. It's designed to be easy-to-read and easy-to-write. Markdown files usually have extensions like `.md` or `.markdown`. For example, **bold** can be achieved with double asterisks before and after the text to be bolded, like so: `**this text would be bold**`.
- **Relevance to Authors**: Markdown is often used in content creation and documentation. Many AI tools that generate or analyze text can accept Markdown as input or produce Markdown-formatted output. This enables easy formatting for various forms of publishing, from blogs to e-books. This guide itself was written in Markdown.
- **Useful Resource**: A fantastic markdown guide can be found [here](https://github.com/adam-p/markdown-here/wiki/Markdown-Cheatsheet). (https://github.com/adam-p/markdown-here/wiki/Markdown-Cheatsheet)

2. **Chatbot**

- **Definition**: A computer program designed to simulate conversation with human users.
- **Relevance to Authors**: Chatbots can be employed for interactive storytelling or to answer queries on an author's website.

3. **Sentiment Analysis**

- **Definition**: Using AI to determine the mood or sentiment expressed in a piece of text.
- **Relevance to Authors**: Useful for gauging public opinion on written works, or for analyzing characters in a story.

4. **Text Generation**

- **Definition**: Creating new pieces of text based on a given prompt or dataset. Note that human editing is almost always necessary, even for simple tasks.
- **Relevance to Authors**: Can be used for generating ideas, outlines, or even drafts, although human editing is usually still necessary.

5. **Text Summarization**

- **Definition**: Reducing long pieces of text into shorter summaries while retaining important points.
- **Relevance to Authors**: Useful for summarizing research or notes, and for generating abstracts or book summaries.

6. **Prompt**

- **Definition**: In the context of AI text and image generation, a prompt is a user-provided input that guides the model in generating appropriate output. For example, you might input "Once upon a time" into a text-generation model to generate a story, or "A bag of noodles" to generate an image.
- **Relevance to Authors**: Prompts are essential for using AI writing tools effectively. Knowing how to formulate a good prompt can help you obtain the specific output you desire, whether it's story ideas, dialogue, research, images, or something else.

7. **Keyword Extraction**

- **Definition**: Identifying and extracting the most important words or phrases from a body of text.
- **Relevance to Authors**: Helpful for SEO (Search Engine Optimization) or for quickly understanding the main themes of a text.

8. **Topic Modeling**

- **Definition**: Using machine learning to automatically identify topics present in a large collection of text.
- **Relevance to Authors**: Useful for understanding the underlying themes in your writing or in a collection of texts.

9. **Plagiarism Detection**
   - **Definition**: Software that compares a piece of writing to other works to identify any potential plagiarism.
   - **Relevance to Authors**: Can be used for ensuring the originality of your work.

10. **Autocomplete/Predictive Text**
    - **Definition**: Features in word processors or text editors that predict and suggest the next word or phrase the user is likely to type.
    - **Relevance to Authors**: Can speed up the writing process and sometimes offer useful suggestions.

11. **Spelling and Grammar Checkers**
    - **Definition**: Tools that scan text for spelling and grammatical errors, offering corrections or suggestions for improvement.
    - **Relevance to Authors**: Essential for polishing drafts and improving the quality of writing.

12. **Text-to-Speech & Speech-to-Text**
    - **Definition**: Text-to-Speech converts written text into spoken words, and Speech-to-Text does the reverse.
    - **Relevance to Authors**: Useful for accessibility, and Speech-to-Text can be used for dictating writing. Can also be used for audiobooks or audio versions of articles. It's done wonders for accessibility and convenience on some blogs and news sites.

Basic AI and Machine Learning Terms

While this is far from an exhaustive list of terms, they're certainly some of the most common, and provide a nice foothold while navigating documents and articles about AI.

1. **AI (Artificial Intelligence)**
   - **Definition**: Machines or software that can perform tasks that typically require human intelligence such as pattern recognition, decision-making, or language comprehension.
   - **Relevance to Authors**: AI can assist in various writing tasks, such as basic editing, summarization, and even brainstorming ideas for storytelling.

2. **Machine Learning**
   - **Definition**: A subset of AI, where the models are trained to make judgement calls based on the data they have been fed, by recognizing patterns within that data. An example of this would be Roombas using machine learning for collision-avoidance.
   - **Relevance to Authors**: Machine learning algorithms can analyze your writing style, suggest improvements, and even predict what you might want to write next.
   - **Note**: Not all AI is based on machine learning, though it is becoming increasingly common.

3. **Model**

- **Definition**: In the context of AI and machine learning, a model refers to a mathematical representation of a real-world process based on data. This 'trained model' can make guesses (or 'inferences') about new data it has never seen before.

- **Relevance to Authors**: Understanding what a model is can help authors grasp the underlying mechanics of various AI tools. For instance, a text generation model has been trained on vast amounts of text data, enabling it to generate human-like text based on the patterns it has learned. Meanwhile, an image generation model has been trained on a catalogue of curated and labeled images, allowing it to generate or refine images based on patterns it has picked up from those images.

4. **Neural Network**

- **Definition**: A type of machine learning model inspired by the structure of human brain (though greatly simplified), consisting of interconnected nodes or "neurons." They are great for complex tasks, but can be computationally expensive.

- **Relevance to Authors**: Neural networks power advanced text-generation tools and can be used for complex tasks like translation and summarization.

5. **Training**

- **Definition**: In the context of machine learning and AI, training refers to the process of teaching a model to make predictions or decisions based on a dataset. The model learns patterns from 'training data' and uses this knowledge for future tasks.

- **Relevance to Authors**: Understanding that AI models require training helps authors grasp why certain tools may be more accurate or specialized. For example, a text-generating AI trained on scientific papers will produce different results compared to one trained on religious texts.

6. **Algorithm**

- **Definition**: A step-by-step procedure or formula for solving a problem. Think of the series of steps you were taught for solving algebra problems in school. Several of those methodologies could be considered algorithms.

- **Relevance to Authors**: Algorithms are the building blocks of AI tools, affecting how well these tools understand and assist with your writing tasks.

7. **API**

- **Definition**: A set of rules that allow different software entities to communicate with each other. For example, many website building platforms like WordPress, Squarespace, or Wix utilize APIs to incorporate functionality from social media networks (Twitter/X, Facebook, etc) or payment processors (Stripe, Square, PayPal, etc).

- **Relevance to Authors**: Allows integration of AI services into existing writing platforms or custom-built applications.

- **Note**: APIs allow for easier integration, but often at the expense of customization or control.

8. **Turing Test**

- **Definition**: A test of a machine's ability to exhibit human-like intelligence, particularly the ability to engage in natural language conversation. Proposed by Alan Turing in 1950. You will see this term frequently appear in news articles about AI.

- **Relevance to Authors**: The Turing Test is a measure of how convincingly a text-generating AI can simulate human-like writing. It should be noted that the 'writing' in this instance is of a conversational nature like a chatroom, not long-form writing such as a novel.
- **Note**: Passing the Turing Test is not considered the ultimate goal of AI by most researchers, but it's often used as a benchmark in popular media.

9. **Data Set**
   - **Definition**: A collection of data used to train or test a machine learning model.
   - **Relevance to Authors**: The quality of a data set can affect how accurately an AI tool performs tasks like sentiment analysis or text classification.
   - **Note**: Not all data is equal. Poorly-curated data can produce skewed results. Examples of poor curation would be 'noisy' data with lots of irrelevant information or information from sources that trend toward one direction not representative of a larger whole.

10. **Data Mining**
    - **Definition**: The computational process of discovering patterns or knowledge from large sets of data.
    - **Relevance to Authors**: Useful for automated research and content curation (automatically categorizing content would be an example of this).

11. **Natural Language Processing (NLP)**
    - **Definition**: A field of AI focused on the interaction between computers and human language.
    - **Relevance to Authors**: NLP technologies can help with grammar checking, summarization, and even generating written content.
    - **Note**: This is the technology behind voice-activated assistants like Apple's Siri, Google Assistant, or Microsoft's Cortana (now defunct).

12. **Deep Learning**
    - **Definition**: A subfield of machine learning focused on algorithms inspired by the structure and function of the brain, known as artificial neural networks. Deep learning reflects a specialized type of neural network with multiple layers ("deep") that can model more complex functions.
    - **Relevance to Authors**: Powers some of the most advanced text generation and analysis tools; however, it often requires significant computational resources (powerful computer hardware).

13. **Supervised Learning**
    - **Definition**: A type of machine learning where the model is trained on a labeled data set, meaning each piece of data includes the "answer" the model should come up with.
    - **Relevance to Authors**: This is commonly used in tasks like spam filtering and text categorization.

14. **Unsupervised Learning**
    - **Definition**: A type of machine learning where the model is trained on an unlabeled data set, allowing it to identify patterns on its own. This is often used for data exploration, finding hidden patterns or clusters in data.
    - **Relevance to Authors**: Useful for clustering similar documents or discovering underlying themes in a body of text.

15. **Reinforcement Learning**
    - **Definition**: A type of machine learning where an agent (AI) learns to make decisions by performing actions and receiving rewards. This is frequently used in robotics and simulation training.
    - **Relevance to Authors**: Currently less relevant to writing but has potential applications in automated research and information gathering.

16. **Overfitting & Underfitting**
    - **Definition**: Overfitting occurs when a model learns the training data too well, including its noise (useless, extra stuff in the data it was trained on) and outliers (statistical anomalies that can throw the model off), and performs poorly on new data. Underfitting is when the model is too simplistic to capture underlying trends.
    - **Relevance to Authors**: Understanding these terms can help you better evaluate the quality and reliability of AI-powered writing tools.

Miscellaneous Terms

These are a lot of the 'buzz words' you're likely to come across in articles covering technological advancements.

1. **IoT (Internet of Things)**
    - **Definition**: A network of interconnected physical devices that collect and share data.
    - **Relevance to Authors**: Less directly relevant to writing but can be a rich subject matter for stories, or used in interactive storytelling.

2. **GAN (Generative Adversarial Network)**
    - **Definition**: A type of artificial intelligence model in a form of unsupervised machine learning, applied using two neural networks.
    - **Relevance to Authors**: Can be used for creating original visual content related to a book or article, although less relevant for text-based tasks.

3. **Blockchain**
    - **Definition**: A decentralized digital ledger technology. Effectively a different kind of database with added security, but much slower. This term gained prominence with the advent of cryptocurrencies such as Bitcoin.
    - **Relevance to Authors**: Could revolutionize copyright and publishing by providing indisputable proof of original work in a publicly-auditable way.

4. **Quantum Computing**
    - **Definition**: Computation methods based on the principles of quantum theory.
    - **Relevance to Authors**: Currently not directly applicable to writing, but has the potential to drastically accelerate AI model training in the future.

5. **Augmented Reality (AR) & Virtual Reality (VR)**
    - **Definition**: AR overlays digital information on the real world through devices like smartphones or AR glasses, while VR provides a completely digital immersive environment.
    - **Relevance to Authors**: These could be used as new platforms for interactive storytelling or for enhancing the reading experience with 'side content' in your world.