Once Upon an Algorithm: How Stories Explain Computing

The Power of Storytelling

Stories have the power to captivate our imaginations, transport us to different worlds, and teach us valuable lessons. They are a powerful tool that can be used to explain even the most complex concepts in a way that is both engaging and easy to understand.

This is especially true when it comes to computing. Computing is a vast and complex field, but it can be difficult to explain its many concepts in a way that is accessible to everyone. This is where storytelling comes in.

Once Upon an Algorithm: How Stories Explain Computing by Martin Erwig

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Algorithms in Everyday Life

One of the most important concepts in computing is the algorithm. An algorithm is a set of instructions that tells a computer how to perform a

task. Algorithms are used in everything from search engines to social media to self-driving cars.

But what exactly is an algorithm? And how do they work? These are questions that can be difficult to answer in a straightforward way. But by using stories, we can make these concepts more relatable and easier to understand.

The Traveling Salesman Problem

For example, let's consider the traveling salesman problem. This is a classic problem in computer science that asks the following question: given a list of cities and the distances between them, what is the shortest possible route that a salesman can take to visit each city once and return to his starting point?

This is a complex problem that can be difficult to solve using traditional methods. But by using a story, we can make the problem more relatable and easier to understand.

Imagine a traveling salesman who is trying to visit 10 cities. He starts in New York City and needs to visit Boston, Philadelphia, Washington, D.C., Atlanta, Miami, New Orleans, Dallas, Denver, and Los Angeles before returning to New York City.

The salesman can visit the cities in any order, but he wants to find the shortest possible route. He could try to brute force the problem by trying every possible route, but this would take a very long time.

Instead, the salesman can use an algorithm to find the shortest possible route. One algorithm that he could use is the greedy algorithm. The greedy

algorithm works by always choosing the next city that is closest to the current city.

Using the greedy algorithm, the salesman would visit the cities in the following order: New York City, Philadelphia, Washington, D.C., Atlanta, Miami, New Orleans, Dallas, Denver, Los Angeles, and New York City.

This route is not the shortest possible route, but it is a good approximation. The salesman could find a shorter route by using a more complex algorithm, but the greedy algorithm is a good starting point.

Artificial Intelligence and Storytelling

Stories are not just useful for explaining basic concepts in computing. They can also be used to explain more advanced concepts, such as artificial intelligence (AI).

AI is a branch of computer science that deals with the creation of intelligent agents. Intelligent agents are computer programs that can learn from their experiences and make decisions without human intervention.

AI is a complex and rapidly growing field, but it can be difficult to explain its many concepts in a way that is accessible to everyone. This is where storytelling comes in.

For example, let's consider the concept of machine learning. Machine learning is a type of AI that allows computers to learn from data without being explicitly programmed. This is a powerful technique that can be used for a variety of tasks, such as image recognition, natural language processing, and speech recognition.

But how does machine learning actually work? This is a question that can be difficult to answer in a straightforward way. But by using a story, we can make the concept more relatable and easier to understand.

Imagine a child learning to read. The child starts by learning the alphabet. Then, the child learns how to combine letters to form words. Finally, the child learns how to combine words to form sentences.

The child does not learn to read by being explicitly programmed. Instead, the child learns by observing the world around them and making inferences about how the written word works.

Machine learning works in a similar way. Machine learning algorithms learn by observing data and making inferences about the world around them. The more data that a machine learning algorithm sees, the better it will be able to learn.

The Benefits of Storytelling in Computing

Storytelling is a powerful tool that can be used to explain computing concepts in a way that is both engaging and easy to understand. Stories can help to make complex ideas more relatable, foster creativity, and promote a deeper appreciation for the field of computing.

Here are some of the benefits of using storytelling in computing education:

- Stories can help to make complex ideas more relatable. When students hear a story about a real-world problem that was solved using computing, they are more likely to understand the concepts involved.
- Stories can foster creativity. When students are asked to create their own stories about computing, they are forced to think creatively about

the concepts involved. This can help them to develop a deeper understanding of the subject.

- Stories can promote a deeper appreciation for the field of computing. When students learn about the history of computing and the people who have made significant contributions to the field, they are more likely to develop a passion for the subject.

Storytelling is a powerful tool that can be used to explain computing concepts in a way that is both engaging and easy to understand. Stories can help to make complex ideas more relatable, foster creativity, and promote a deeper appreciation for the field of computing. As educators and researchers, we should continue to explore the use of storytelling in computing education.

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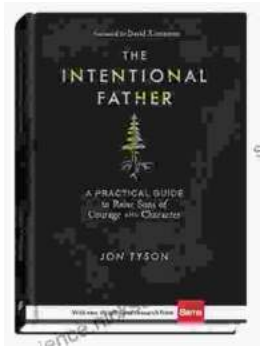

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