**DEFINING THE PROBLEM**

**Problem Statement**

* It is easy for the human to perform a task accurately by practicing it repeatedly and memorizing it for the next time. The human brain can process and analyze images easily. Also, recognize the different elements present in the images.
* The main disadvantage is that **there is no possibility of obtaining information about the type of input**. First, the text has to be separated into characters or words. With Hidden Markov Models or Neural Networks these words are matched to a sequence of data.
* The issue is that **there's a wide range of handwriting – good and bad**. This makes it tricky for programmers to provide enough examples of how every character might look. Plus, sometimes, characters look very similar, making it hard for a computer to recognize accurately.
* Joined-up handwriting is another challenge for computers. When your letters all connect, it makes it hard for computers to recognize individual characters. Consider, for instance, an ‘r’ and an ‘n’. Joined up, these letters could be mistaken for an ‘m’.
* In the case of handwriting recognition from photos, there are also awkward angles to consider. The angle the photo is taken could obscure the character, making it harder for the computer to identify.
* It’s clear, then, that for computers to recognize and digitize handwritten documents and messages, there’s a lot to learn. There are different letters, characters and digits. But there’s also the importance of being able to identify them despite differences due to different handwriting styles.
* This is where [**deep learning**](https://www.thinkautomation.com/eli5/eli5-what-is-deep-learning/) and [**neural networks**](https://www.thinkautomation.com/eli5/eli5-what-is-an-artificial-neural-network/) are coming into handwriting recognition. Deep learning allows machines to learn over time, and adapt their output using weights.
* In other words, the machine can learn how to identify letters despite different handwriting. More weight can sit on the factors that stay largely the same across handwriting. This means that deep learning is more adaptable to handwriting changes.
* In a world [**running on data**](https://www.thinkautomation.com/future-of-work/making-big-data-work-for-you-a-roundtable-discussion/) , accurate handwriting recognition could become a powerful tool. With it, hastily scribbled notes and formal, handwritten letters become readable by a computer.

We aren’t there yet.

But, with the help of deep learning, AI could one day greatly improve the accuracy and ability of handwritten text recognition.

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