

What is a Quantizer?

A Bedtime Story

What is a Quantizer?

Mr. Source lived in England while his sister Mme. Destination lived in France. Mme. Destination had always wanted to meet her little nephew, but she had never had the chance.

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Mr Source took his son, Sample, to the Post Office where Postmaster Quantizer worked. The postmaster told him that if he wanted to send source directly to France it would cost £100.

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Mr. Source said to Mr. Quantizer, “It is too expensive to send Sample directly over *The Channel* to France! Is there anything else that you can do?”

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Postmaster Quantizer replied, “Of course there is, I do this sort of thing all the time! You see, I have met millions of children before so I have a pretty good idea of what the average child looks like.”

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“In fact,” he continued, “I have come to realize that no matter what child comes in my door, he looks close enough to one of 100 average children. So close, in fact, that someone on the other side of *The Channel* won’t be bothered by the difference!”

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“Your son looks like Average Child #12,” said Postmaster Quantizer. He then picked up the phone and called his friend in France, Maître de Poste Quantificateur, and promptly shouted, “Douze!” and hung up the phone.

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When Mme. Destination went to the post office later that day in France, Monsieur Quantificateur went into the back, and soon returned with an Average Child #12.

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Mme. Destination had never been so pleased!
She finally knew what Sample looked like.

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The moral of the story is you don't have to send the whole sample over the channel. You can assign the sample to a predetermined average value, that is in a set of many average values called a codebook, and then only send the index of that value over the channel.

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Vector quantization is much the same. Just imagine that Mr. Source's five children must now travel across *The Channel*. Since they have some common traits, we group them together, assign that grouping an index, and send that index over the channel.