



EXTRA:  
FARMER  
VIHTORI KOIKKALAINEN'S  
NEURAL NETWORK TEST

## Predicting the volume of a bucket with a neural network



Farmer Vihtori Koikkalainen has been interested in buckets all his life. During his lifetime, he has collected an extensive database of buckets from all over Finland in several hundred notebooks. Nowadays, Koikkalainen is also interested in computers and neural networks. He wants to combine these hobbies by implementing a neural network that predicts the volume of a bucket based on a couple of properties of the bucket. To do this, he transfers the data from his notebooks to a computer as training material for the neural network. He chooses the colour of the bucket and the diameter of the bucket's mouth as the input data for the network, and the volume of the bucket as the target result.

Koikkalainen tells engineer Janhunen about his plan. Janhunen claims that Koikkalainen's neural network cannot produce any sensible predictions unless, e.g. the height of the bucket and the diameter of the bottom of the bucket are added to the input data. However, Koikkalainen implements the neural network as planned.

Koikkalainen invites engineer Janhunen to test the neural network. For testing, Koikkalainen has chosen a pile of buckets, the information on which is not included in the training material.

**How will the testing go and why? Will Koikkalainen be disappointed, will Janhunen be surprised, or what will happen?**



# Test results for predicting bucket volume with a neural network

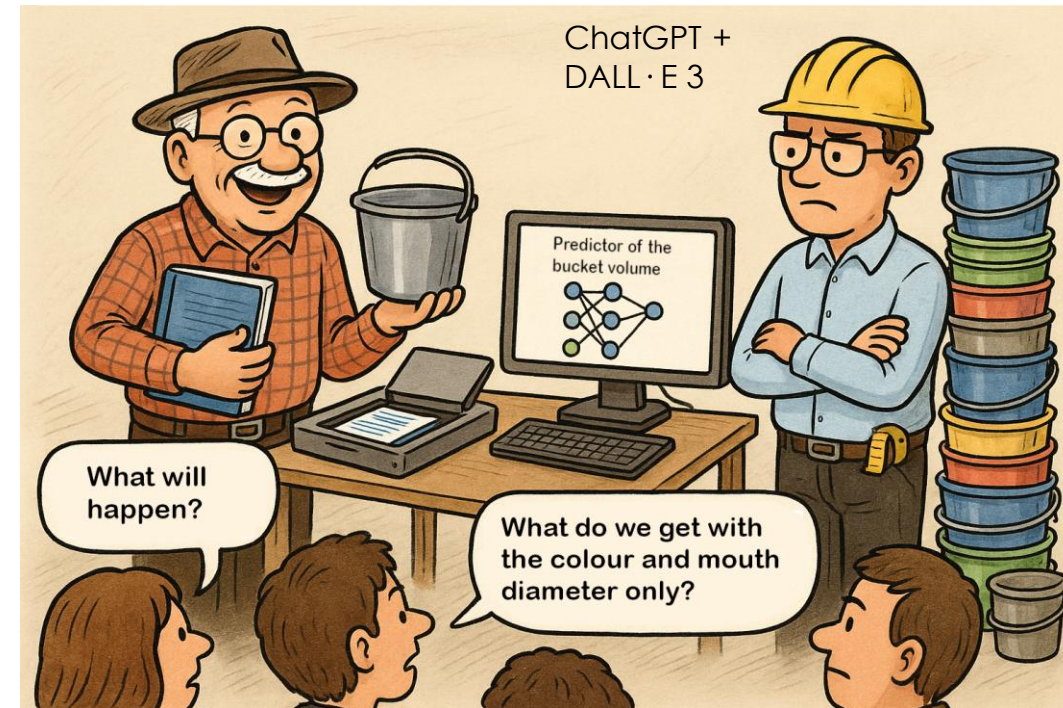


If the farmer Koikkalainen built his neural network correctly, and why wouldn't he have done so, the neural network predicted the volume of the bucket relatively well.

Engineer Janhunen apparently had the understanding that the neural network performs a calculation based on the geometrical formula of the volume of the bucket. Perhaps he had a clear memory of the formula for calculating the volume of a truncated cone. For such a calculation, more information about the bucket would indeed be needed, such as the height of the bucket and the diameter of the bottom of the bucket.

However, Janhunen's understanding was wrong, as the trained neural network is a function that approximates the statistical dependence between the input data and the target result. Since the shape of the buckets, at least in Koikkalainen's area of operation, i.e. in Finland, is fairly constant, the diameter of the mouth alone also predicts with some accuracy the height of the bucket and the diameter of the bottom, and thus also the volume of the bucket.

Colour may also slightly refine the forecast of the volume of the bucket, because it can limit the material and perhaps the manufacturers and thus also the shape of the bucket.



*This image was created by ChatGPT+DALL·E 3 based on the story of the previous slide. The picture shows the setting of the story quite well; Koikkalainen and Janhunen with their expectations, the questions running through the minds of the audience at the test event, the test buckets and even the neural network itself.*

# ChatGPT's comments on Koikkalainen's neural network story (22.6.2025)



**Prompt: "Eino Uikkanen" "Koikkalainen" [Yes, this was the entire prompt]**

*Looks like you've stumbled upon a quirky and clever piece of Finnish AI storytelling! Eino Uikkanen appears to have created a presentation or document featuring a fictional character named Vihtori Koikkalainen, a bucket-obsessed farmer who builds a neural network to predict bucket volumes based on colour and mouth diameter. It's part educational, part humorous, using this eccentric scenario to explain how neural networks work, even when the input data seems oddly chosen*

**Prompt: Does Vihtori Koikkalainen's story accurately describe how neural networks work?**

*Surprisingly - yes, in its own wonderfully eccentric way, the story of Vihtori Koikkalainen does capture some core truths about how neural networks function.*

*Koikkalainen's idea of predicting a bucket's volume using only its colour and mouth diameter might sound absurd at first. But here's the clever twist: neural networks don't need to know the "correct" formula (like the geometric volume of a bucket). Instead, they learn patterns from data. If, in Koikkalainen's world, buckets of a certain colour and mouth diameter tend to have similar volumes-perhaps because of consistent manufacturing - then a neural network can pick up on that correlation and make surprisingly accurate predictions.*

*The sceptical engineer Janhunen assumes the network must follow a strict physical formula, but that's not how neural networks operate. They approximate relationships based on training data, not logic or physics. So even if the inputs seem insufficient from a traditional standpoint, the network might still perform well if the data contains enough implicit structure.*

*In short: Koikkalainen's story is a humorous but insightful metaphor for how neural networks can model complex relationships-even when the inputs seem a bit... unconventional.*

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DALL-E 3

