1

00:00:00,590 --> 00:00:05,150

[Auto-generated transcript. Edits may have been applied for clarity.]

Now let's look at another model called Support Vector Machines or SVMs.

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00:00:05,660 --> 00:00:12,740

This is a machine learning algorithm that includes a learning step and was originally designed for classification tasks,

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00:00:13,010 --> 00:00:15,050

but can also be used for regression.

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00:00:15,980 --> 00:00:25,130

The core concept of SDM is to draw a decision boundary between data points in the training set so that when a new unseen data point arrives,

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00:00:25,280 --> 00:00:27,110

it can be classified accurately.

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00:00:27,860 --> 00:00:34,910

For example, if you're trying to classify animals by their weight and nose length to determine whether they're cats or elephants,

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00:00:35,120 --> 00:00:43,010

you have a two dimensional problem. The simplest SVM creates a line to separate cats from elephants during training.

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00:00:43,130 --> 00:00:48,410

SVM maximizes the margin the space between the outermost points of each class.

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00:00:48,800 --> 00:00:51,620

These outermost points are called support vectors.

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00:00:51,860 --> 00:00:59,450

The loss function used during SVM training focuses on maximizing this margin, making it an optimization problem.

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00:01:00,260 --> 00:01:05,420

SVM doesn't only create linear boundaries, it can also create nonlinear boundaries,

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00:01:05,570 --> 00:01:10,490

such as circular ones, to separate classes that can't be divided by a straight line.

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00:01:10,940 --> 00:01:16,910

For example, when separating apples and oranges by weight and color, a line may not work well,

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00:01:17,360 --> 00:01:24,350

but an SVM can create a circular decision boundary to separate them to create these curved boundaries.

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00:01:24,500 --> 00:01:33,770

SVM uses kernel functions. This allows it to handle complex nonlinear decision boundaries and makes it useful for regression tasks as well.

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00:01:34,720 --> 00:01:41,230

In summary, SVM can fit decision boundaries as lines, polynomials, circles, or other functions.

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00:01:41,680 --> 00:01:45,190

It's a simple yet powerful classifier and regression mechanism.

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00:01:45,790 --> 00:01:49,870

Additionally, like linear regression, logistic regression, and kohonen,

19

00:01:50,170 --> 00:01:58,690

SVM is computationally efficient and doesn't require extensive resources while still providing strong classification and regression capabilities.