SNS COLLEGE OF TECHNOLOGY

AN AUTONOMOUS INSTITUTION

Approved by AICTE New Delhi & Affiliated to Anna University Chennai
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COIMBATORE

DEPARTMENT OF CIVIL ENGINEERING

MACHINE LEARNING FOR CIVIL ENGINEERS

II YEAR / IV SEMESTER

Unit 2 : Supervised Learning

Topic 3: Gaussian Process Regression (GPR)

1. Gaussian Process Regression is a powerful machine learning technique used for regression analysis.

2. It is a non-parametric method that can be used to model complex relationships between inputs and outputs.

3. GPR models the data as a distribution of functions, where each function is a possible hypothesis that explains the data.

APPLICATIONS OF GPR IN CIVIL ENGINEERING

1. GPR can be used in civil engineering to predict the behavior of complex systems, such as bridges, buildings, and tunnels.

2. It can also be used to predict the performance of materials, such as concrete, asphalt, and steel.

3. GPR has been used to model the response of structures to earthquakes, wind loads, and other environmental factors.

Advantages:

1. GPR is a non-parametric method that can be used to model complex relationships between inputs and outputs.

2. It provides probabilistic predictions that can be used to quantify uncertainty.

3. GPR can be used with small datasets, making it suitable for civil engineering applications where data may be limited.

Limitations:

1. GPR can be computationally expensive for large datasets.

2. It requires careful selection of the kernel function and hyperparameters.

3. GPR may not be suitable for modeling systems with non-Gaussian or non-stationary behavior.

Thank You!!