SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore-35

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

23ADT202 – FUNDAMENTALS OF DATA SCIENCE AND ANALYTICS

II YEAR IV SEM

UNIT III –Decision Rule

EMPATHY

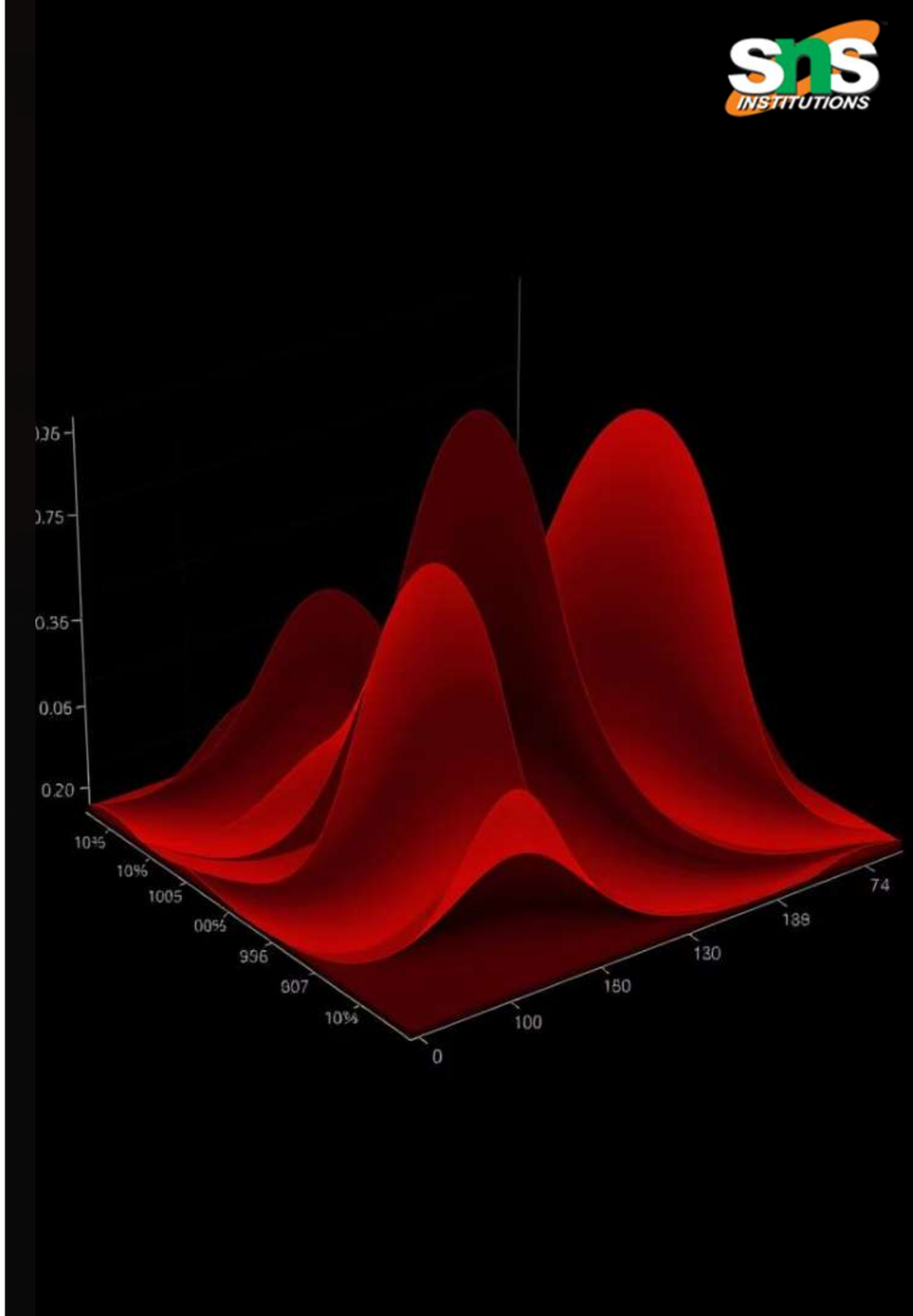
Decisions in engineering:

- Product quality
- ML model approval
- System performance

Need data-driven decisions

Define Problem

- How to make decisions using sample data?
- Challenges: uncertainty, variability



Key Concepts

- H0 & H1
- Test Statistic
- Significance Level
- Decision Rule

Ideate

- Methods:
- - Critical Value
- - P-value
- Compare data with thresholds

PROTOTYPING:

Decision Rule

- Reject or Fail to Reject H0
- Based on alpha, distribution

Visualization

- Normal curve
- Rejection & Acceptance regions

Steps

- 1. State hypotheses
- 2. Choose alpha
- 3. Select test
- 4. Compute
- 5. Decide

TESTING:

Z-Test Formula

$$Z = (\bar{X} - \mu) / (\sigma / \sqrt{n})$$

Critical Value Rule

$|Z| > Z_{critical} \rightarrow$ Reject H0

Else $\rightarrow$ Fail to reject

P-value Rule

If $p \leq \text{alpha} \rightarrow$ Reject H0

Else $\rightarrow$ Fail to reject