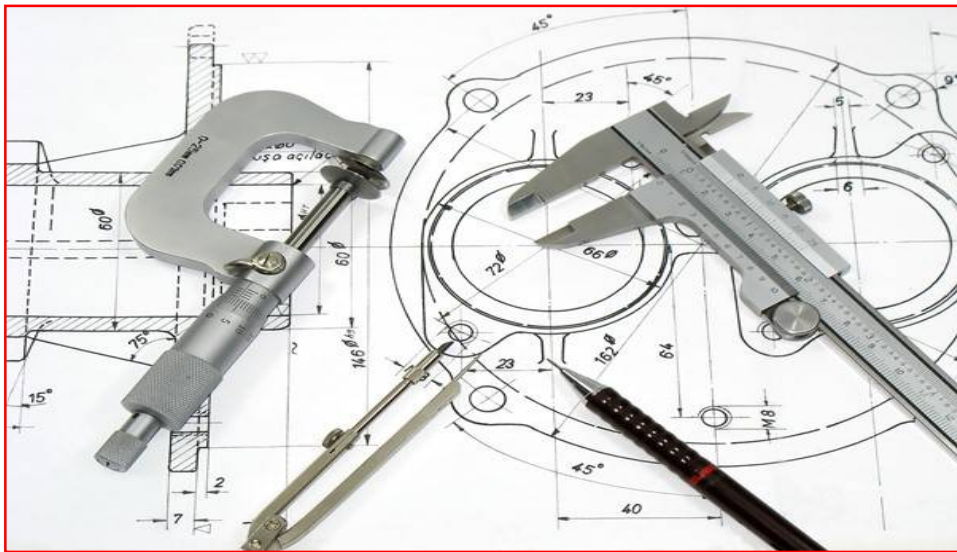# 3D SCANNING DIGITIZATION TECHNIQUE
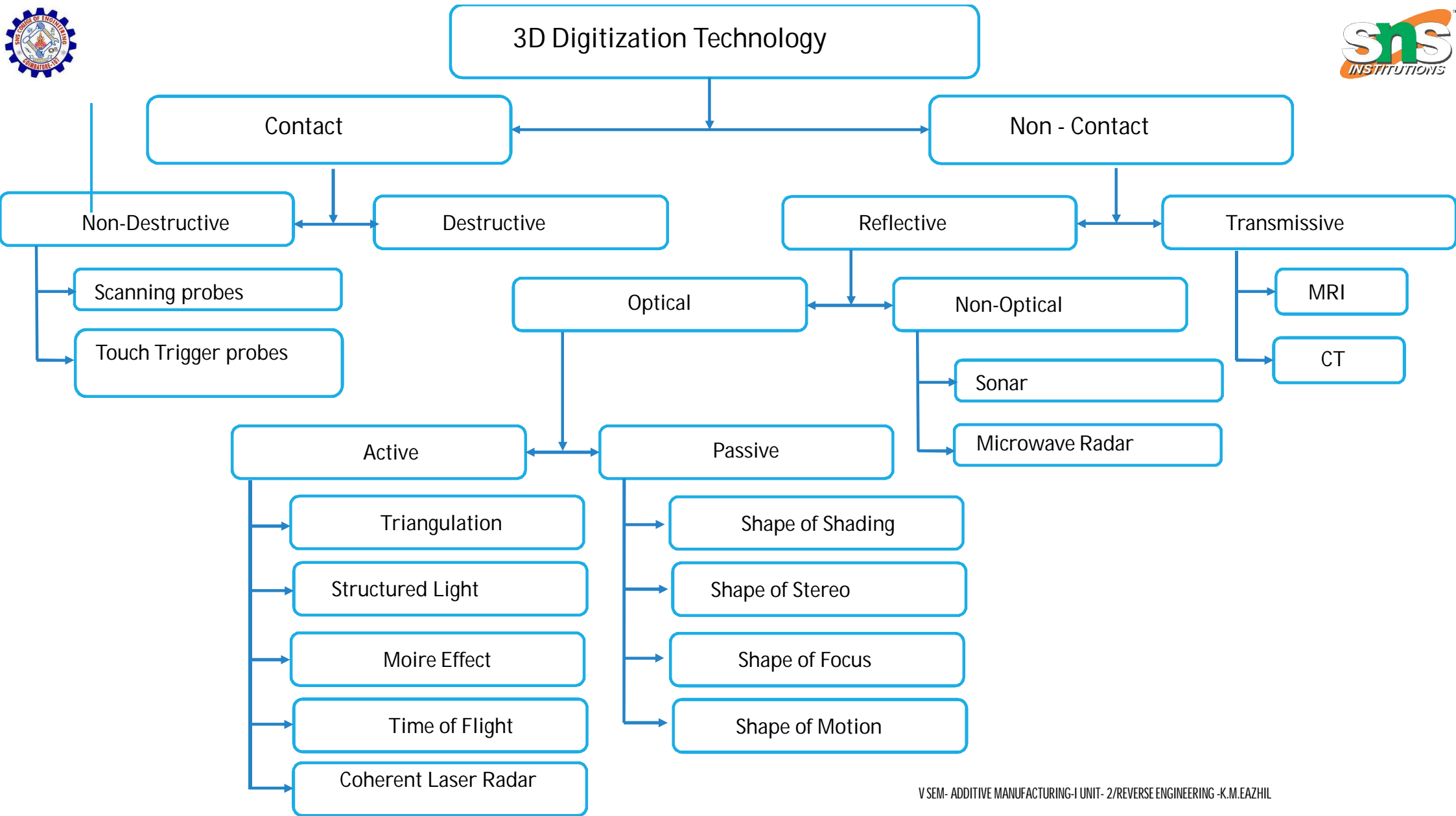
3D SCANNING DIGITIZATION TECHNIQUE

- The technology to **capture 3D data** of objects has been remarkable improved in recent years.

- **Advanced software** and increasingly powerful computers allow a large database and fast **data post-processing**.

- 3D scanners play an important role in vision-based 3D scanning technology.

  1. Contact Techniques.

  2. Non-Contact Techniques.

CONTACT DATA TECHNIQUE

- Contact data acquisition obtains data using a contact measuring process.

- Contact means that the **measuring probe** touches the recovery surface of objects during the data acquisition.

- The devices include joined arms and CMMs.

 - Destructive and

- Non-destructive methods

3D Digitization Technology

- Contact
  - Non-Destructive
    - Scanning probes
    - Touch Trigger probes
  - Destructive
- Non - Contact
  - Reflective
    - Optical
      - Active
        - Triangulation
        - Structured Light
        - Moire Effect
        - Time of Flight
        - Coherent Laser Radar
      - Passive
        - Shape of Shading
        - Shape of Stereo
        - Shape of Focus
        - Shape of Motion
    - Non-Optical
      - Sonar
      - Microwave Radar
  - Transmissive
    - MRI
    - CT

CONTACT BASED

- Contact based methods of reverse engineering have been available for **nearly 40 years**.

- The first method of **reverse engineering** to be introduced was the coordinate measuring machine **(CMM)**.

- A **CMM** gives physical representation of a three dimensional Cartesian coordinate system.

CONTACT METHODS - USE SENSING DEVICES
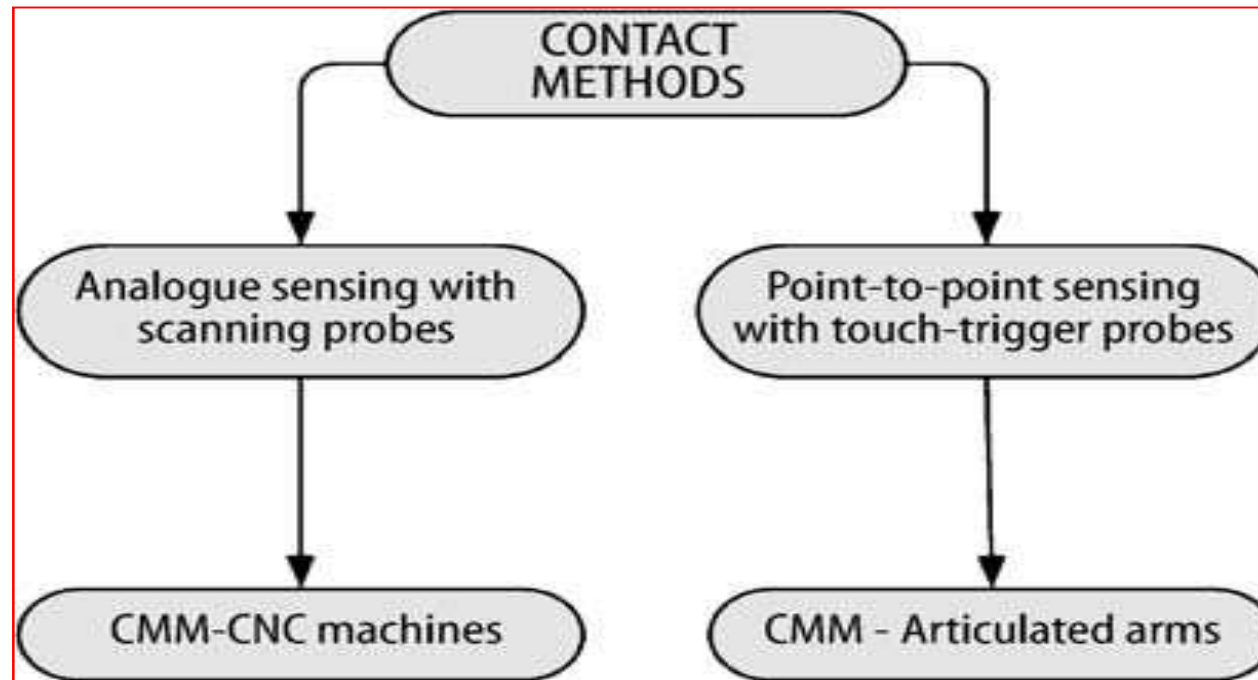
TOUCH TRIGGER PROBES

- In this technique, **a touch-trigger** probe is used that is installed on a **CMM or on an articulated mechanical arm** to gather the coordinate points of a surface.

- A CMM with a **touch-trigger probe** can be move **point to point** on the component.

- **CMM provides more accurate** measurement data compared to the articulated arm.

- However, the limitation of using **CMM, it cannot be used to digitize complex surfaces.**

Touch Trigger Probe with articulated arm

Touch Trigger Probe with CMM

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