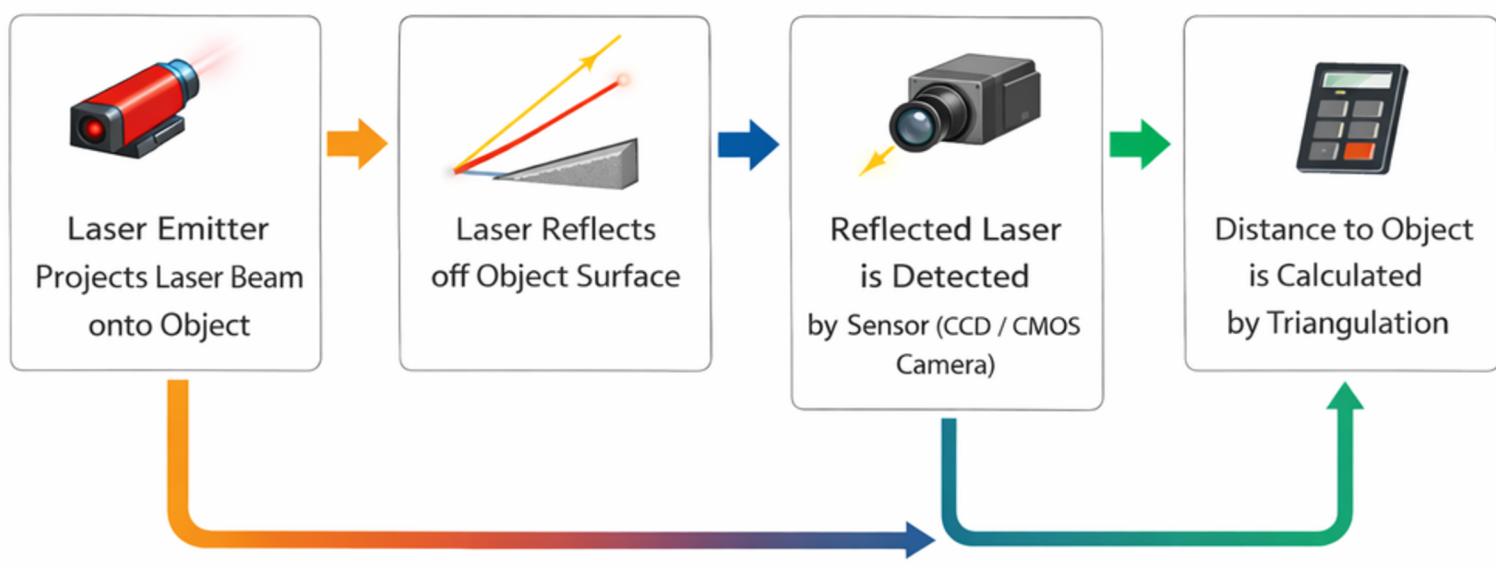


• Laser Triangulation LiDAR

Laser Triangulation LiDAR is a distance-measurement principle that uses a laser beam, camera/sensor, and geometric triangulation to determine how far an object is from the device.

Laser Triangulation Process



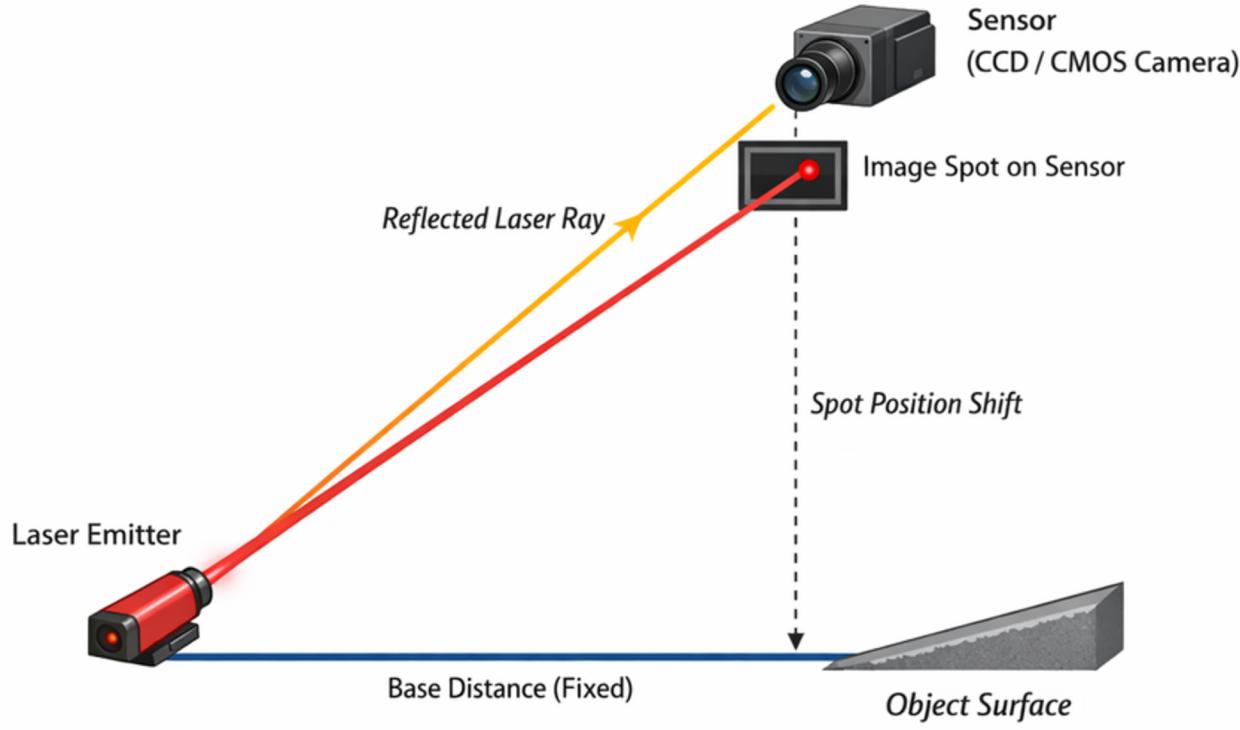
• Triangulation Calculation

Using the known system parameters:

$$Z = \frac{B \cdot f}{x}$$

- Baseline distance B
- Focal length f
- Spot displacement x

Laser Triangulation Method



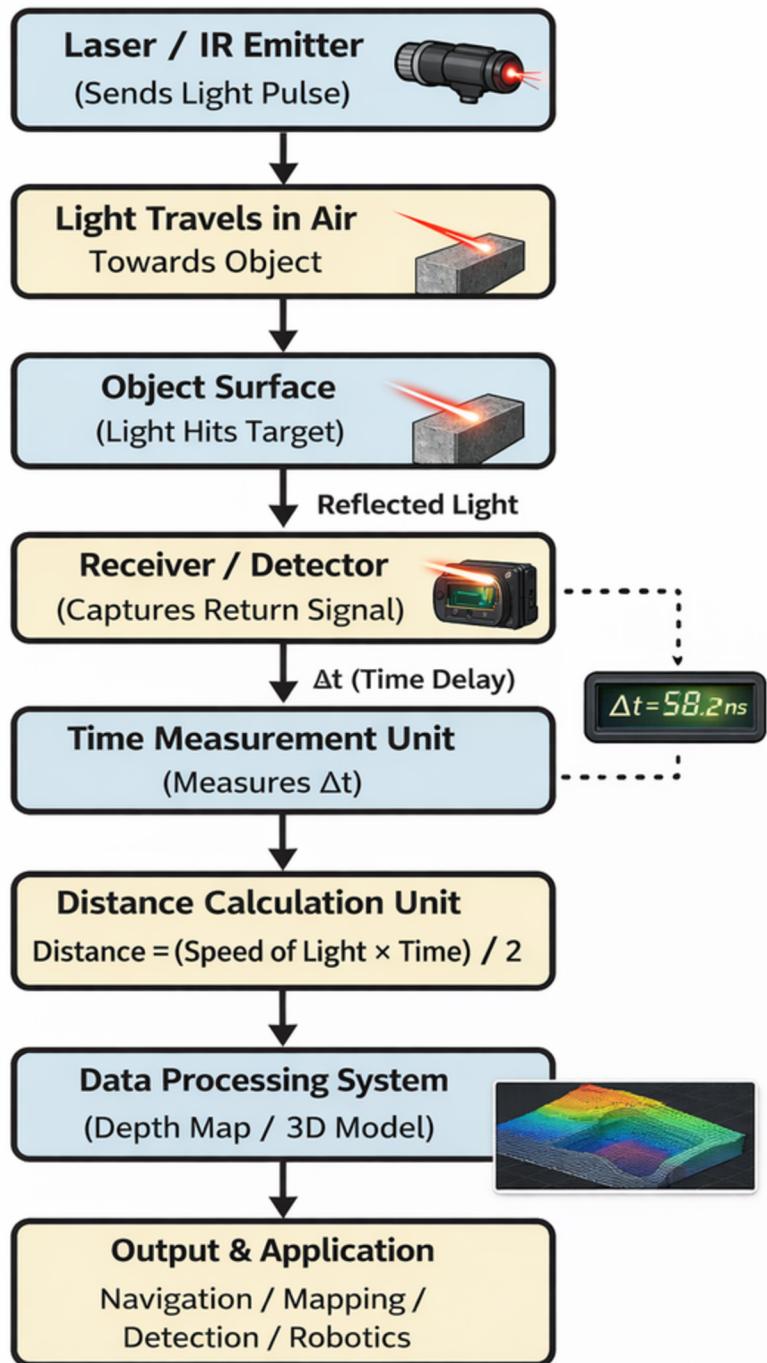
• Where It's Used-

- 🚗 Industrial automation (object measurement).
- 📏 3D scanning / reverse engineering.
- 🤖 Robotics & pick-and-place accuracy.
- ⚙️ Surface profiling & alignment systems.

- **Laser Triangulation = Short distance + High accuracy.**
- **Used for industrial measurement, 3D scanning, automation.**

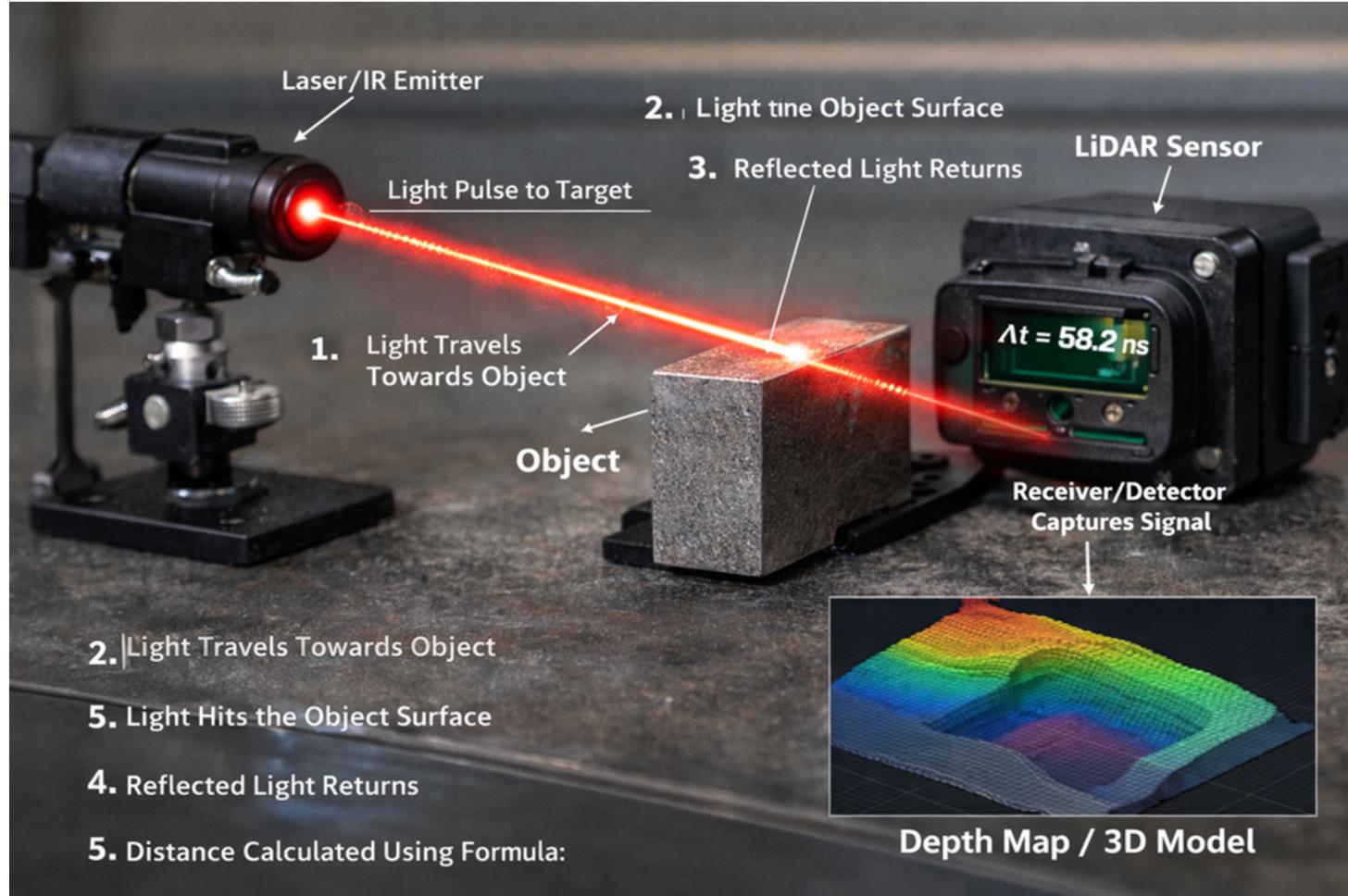
ToF LiDAR (Time-of-Flight LiDAR)

ToF LiDAR (Time-of-Flight LiDAR) is a distance-measuring sensor that sends laser pulses to a target and measures the time it takes for the light to return. From this, it calculates distance and creates depth or 3D mapping.



- Time-of-Flight = Long distance + 3D environment detection
- Used for cars, drones, mapping, navigation

Time-of-Flight LiDAR Operation



• Where ToF LiDAR is Used

- Autonomous vehicles.
- Robotics navigation.
- Drones, smartphones (face unlock & depth sensing).
- Industrial automation, security systems, and 3D mapping applications .