Depth camera's on Apple iPad and iPhone Pro models

Apple uses both **depth cameras** and **LiDAR** in different products, and while they sound similar (both measure distance), they work in different ways and are suited for different use cases.
TrueDepth = short range, detailed face/hand depth → Face ID & AR effects.
LiDAR = room-scale, larger depth sensing → AR, scanning, 3D modeling.

You can think of it like this:

- Depth camera = microscope for your face □□
- LiDAR = flashlight that measures the whole room □□

Depth Camera (TrueDepth system – e.g. Face ID on iPhone/iPad)

- **How it works:**
  - Uses **infrared (IR) structured light**.
  - The projector shines ~30,000 tiny IR dots on your face.
  - An IR camera captures how those dots are distorted by the 3D shape of your face.
  - Software reconstructs a **depth map**.
- **Range:** Short — typically **0.3 to ~1 meter**, optimized for faces and selfies.
- **Use cases on Apple devices:**
  - **Face ID** (unlocking and Apple Pay).
  - **Animoji / Memoji** face tracking.
  - Portrait selfies with depth.
  - AR effects at arm's length.
- **Strengths:**
  - Very accurate at close range.
  - Compact — fits in the notch of iPhones/iPads.
  - Works in total darkness (IR).
- **Limitations:**
  - Not designed for room-scale scanning.
  - Limited depth resolution past ~1m.

LiDAR Scanner (on iPad Pro, iPhone Pro models since 2020)

- **How it works:**
  - Uses **time-of-flight LiDAR**.
  - Shoots pulses of infrared laser light.
  - Measures how long they take to return → direct **distance measurement**.
- **Range:** Much longer — **up to ~5 meters indoors**.
- **Use cases on Apple devices:**
  - Room and object scanning.
  - AR apps that need instant, accurate scene mapping.
  - Faster autofocus in low light (because it knows the distance to objects).
  - 3D scanning (e.g., for art, furniture, architecture).
- **Strengths:**
  - Works at room scale.
  - Very fast: instant AR scene setup.
  - Great for **3D modeling & scanning**.
- **Limitations:**
  - Lower resolution than cameras (you don't get a detailed point cloud like pro LiDAR sensors).
  - Still consumer-grade, not survey-grade accuracy.

Here's a nice blog on how to use Apple Lidar & integrate with **Touchdesigner**:

https://interactiveimmersive.io/blog/touchdesigner-3d/3d-scanning-with-apples-lidar/

Revision #5
Created 2025-04-15 11:18:22 UTC by Daan
Updated 2025-09-10 12:25:54 UTC by Astrid