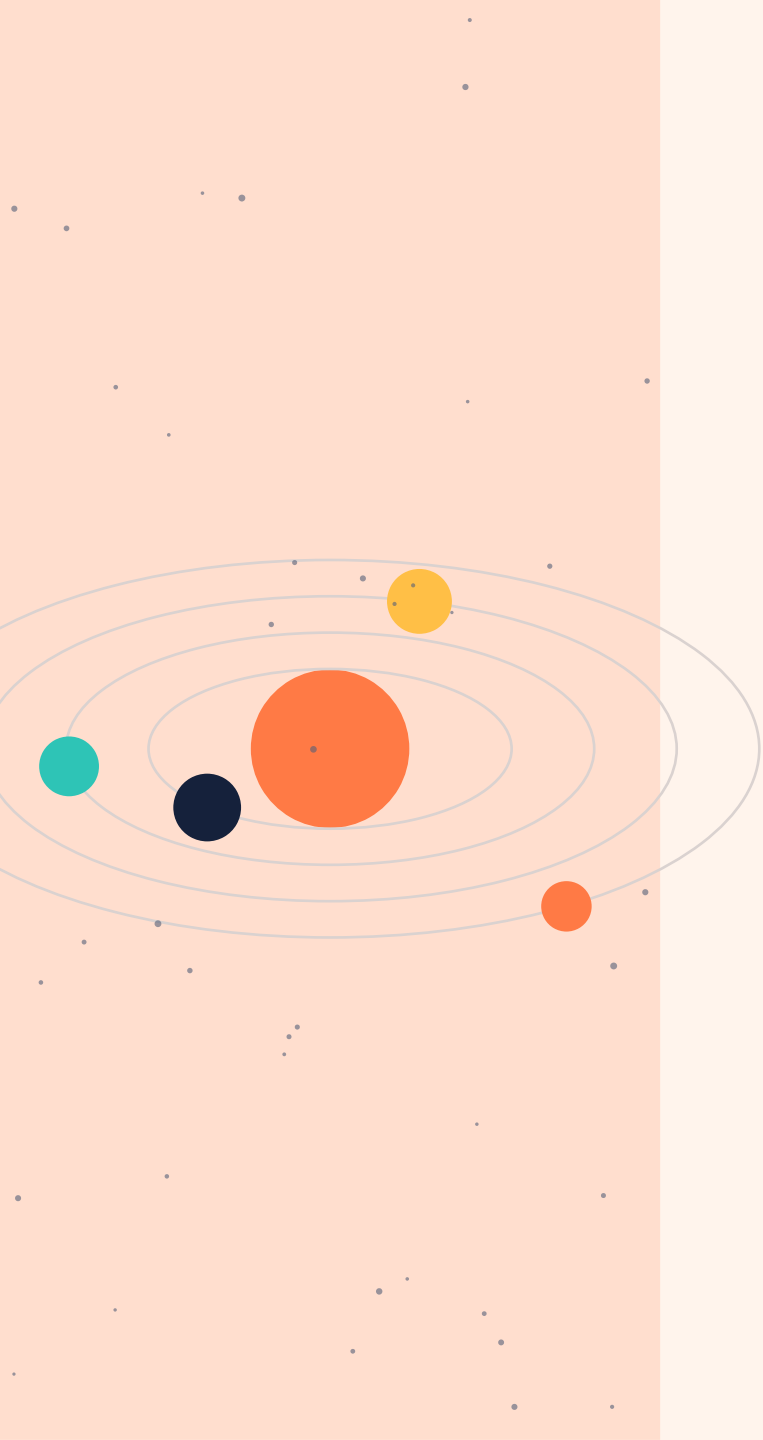




TECHNICAL SEMINAR

Augmented Reality

Blending digital content with the real world

PRESENTED BY

Ishita Verma, Roll No. 21CS045

GUIDE

Dr. S. Banerjee

DATE

March 2026

02 | Agenda

01

Overview

02

Core concepts

03

Applications

04

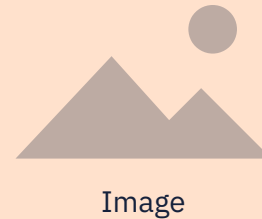
Challenges

05

Future

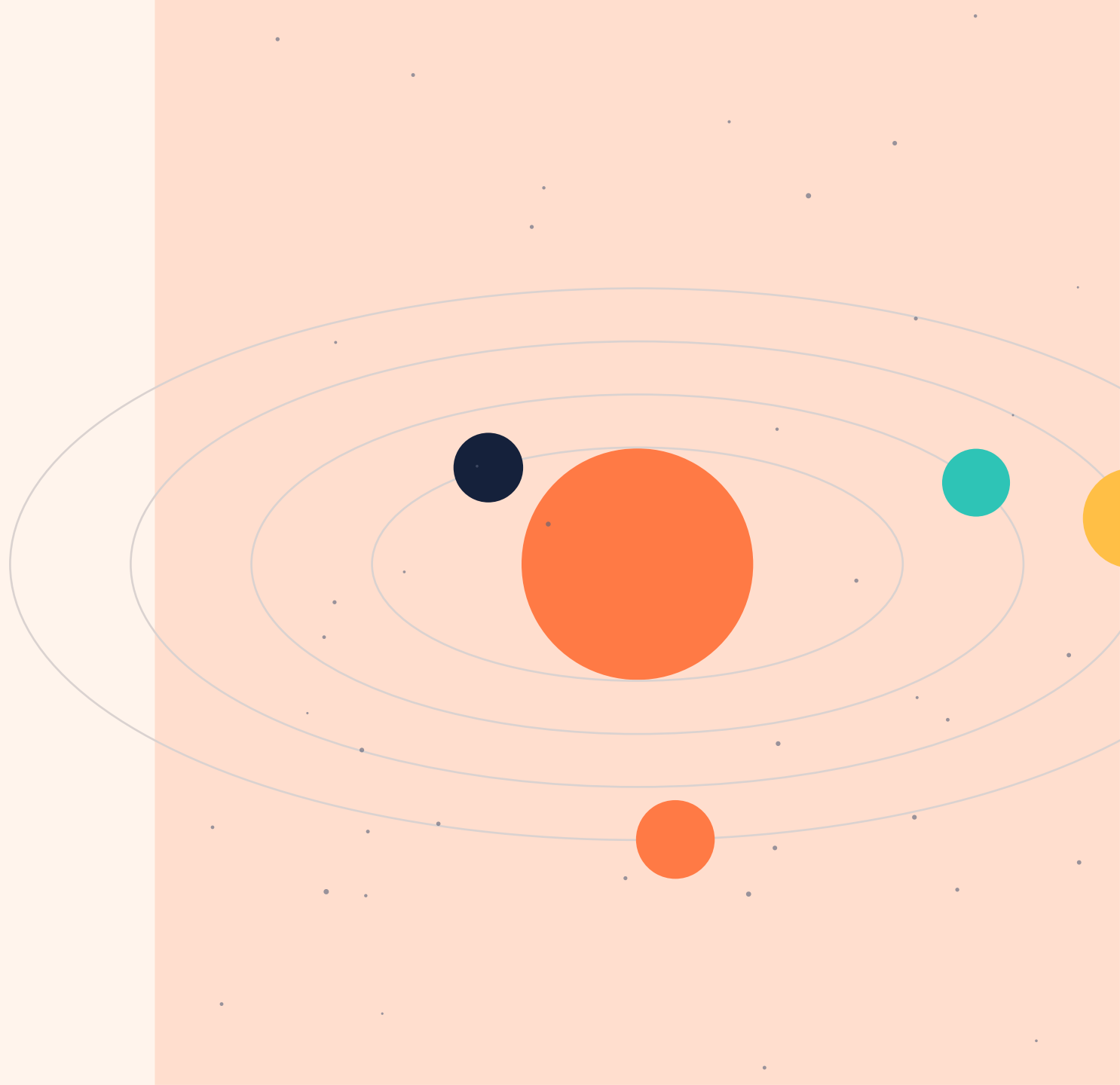
03 | Introduction

- AR overlays digital information on what we see
- It runs on phones, tablets and smart glasses
- Used in retail, education, maintenance and games
- Advances in sensors and AI make it practical



01

CORE CONCEPTS



05 | Key concepts

1

Tracking

Knowing where the device is and what it sees.

2

Rendering

Drawing 3D content aligned to the world.

3

Interaction

Touch, gaze, voice and gestures.

06 | How it works



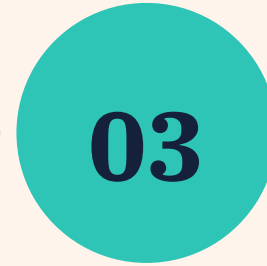
Capture

Camera sees the scene



Understand

Detect surfaces and
objects



Anchor

Place digital content



Render

Show it in real time

07 | Architecture

Camera, sensors and a real-time 3D engine.

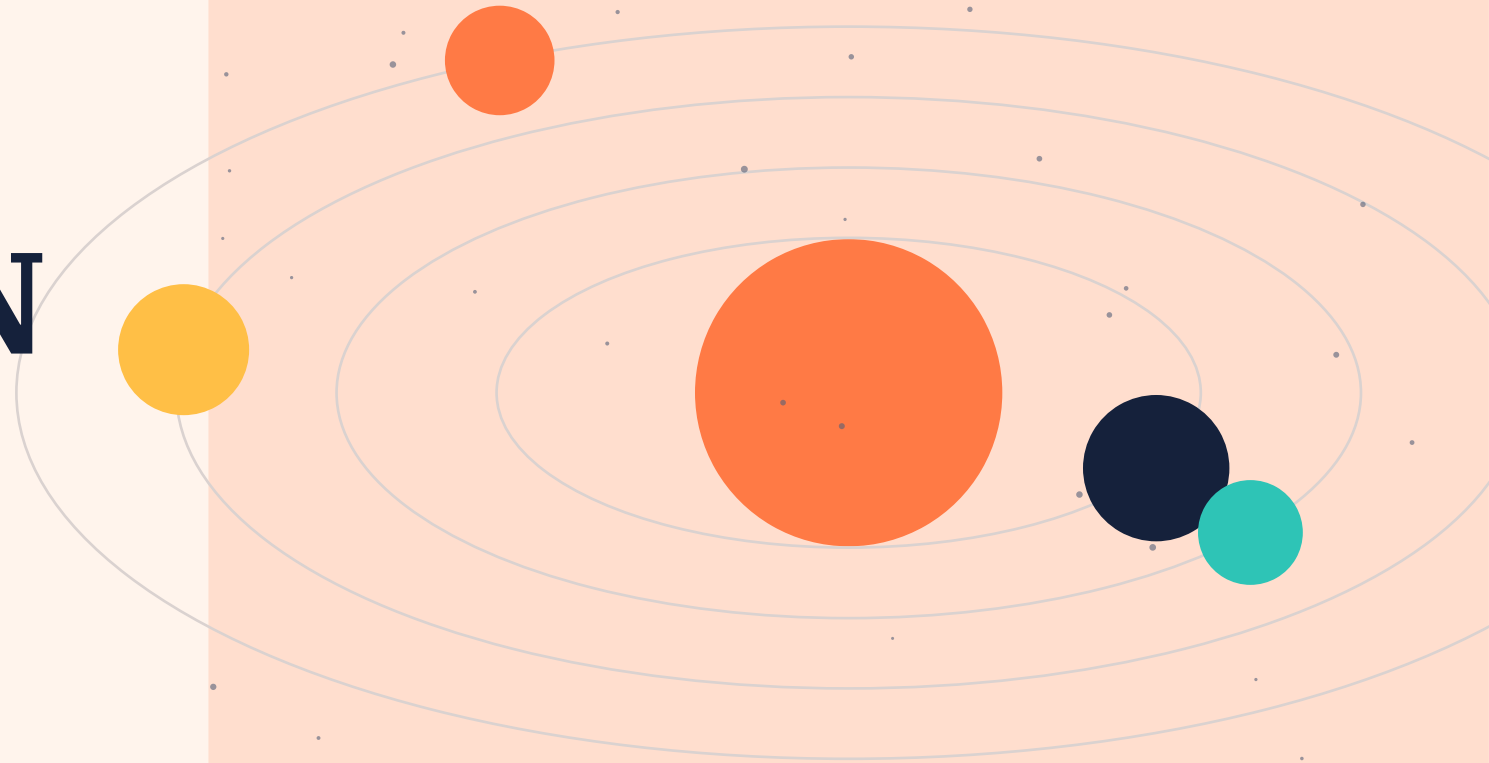
An AR app combines camera frames with motion sensors to map the environment, then a 3D engine renders virtual objects that stay locked to real surfaces as the user moves.



Architecture diagram

02

APPLICATION S



09 | Applications

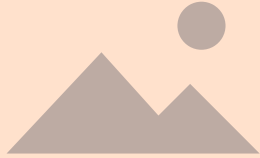


Image 1

Retail

Try furniture or glasses at home.



Image 2

Education

3D models of the heart or planets.

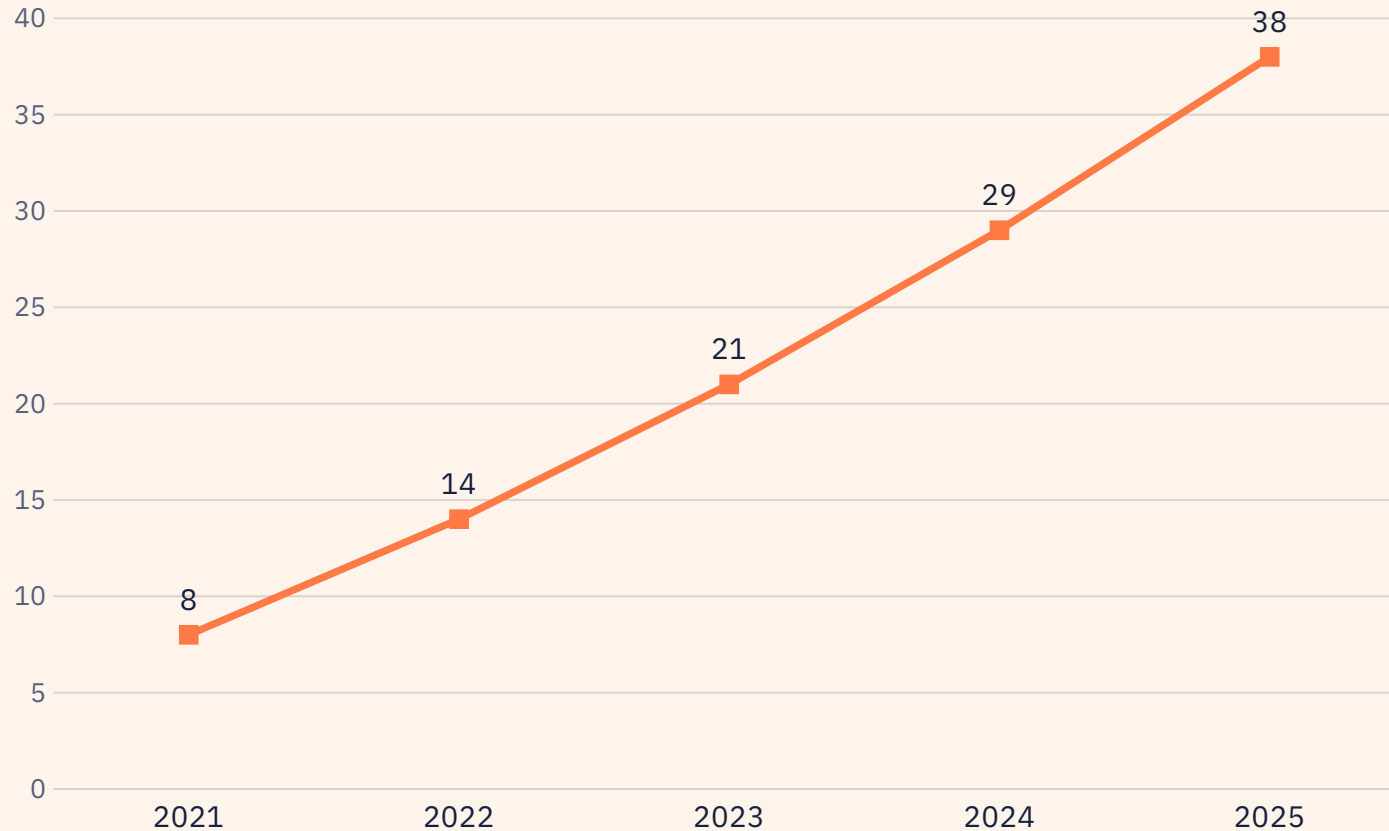


Image 3

Maintenance

Step-by-step repair overlays.

10 | Adoption trend

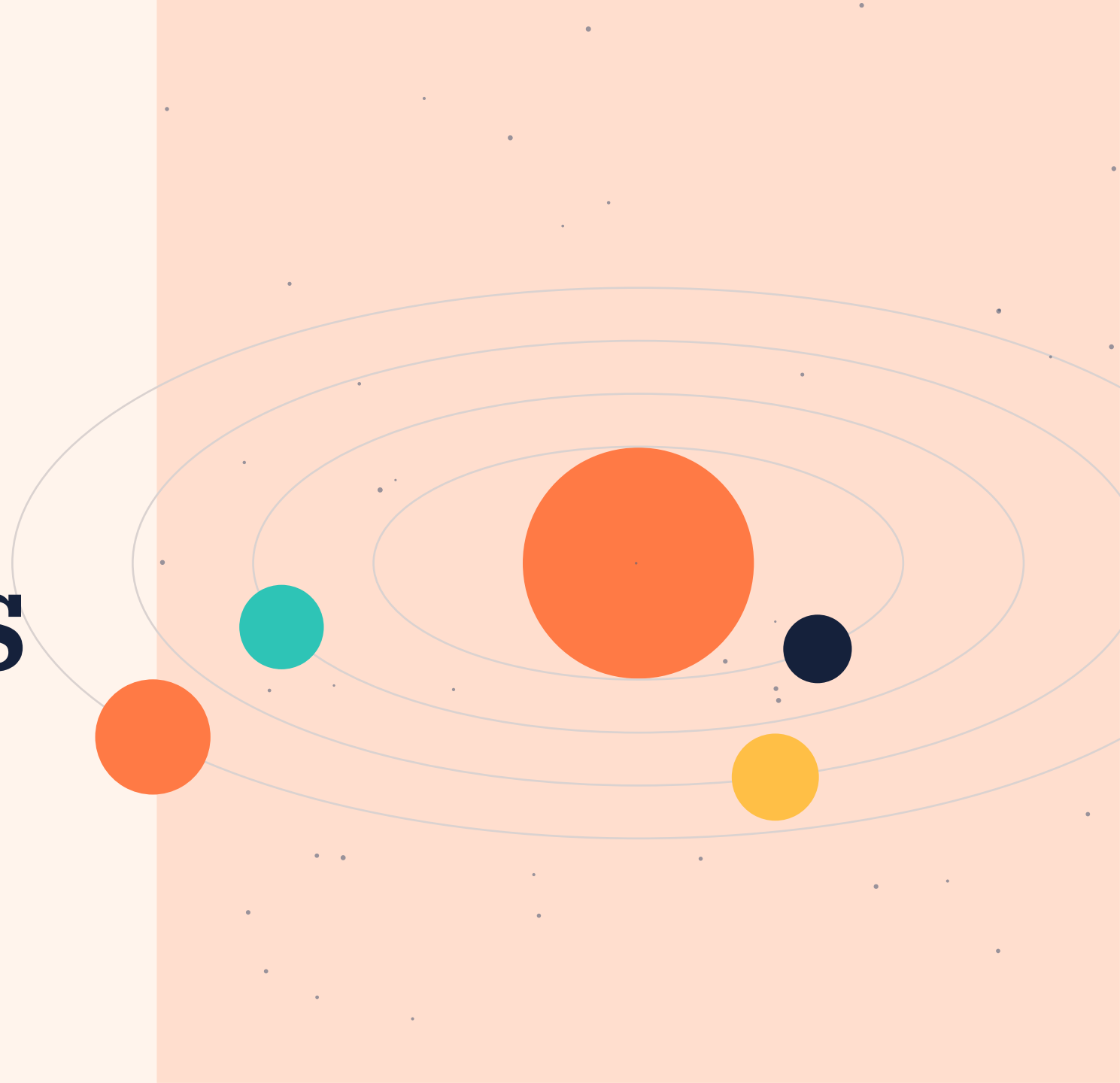


Smartphone users trying AR features (sample data).

Sample data for illustration — replace with your own figures.

03

CHALLENGES



12 | Advantages and limitations

Advantages

- Hands-on learning
- Fewer errors in field work
- Engaging marketing
- Works on existing phones

vs

Limitations

- Battery and heat
- Motion sickness for some
- Privacy of camera data
- Content is costly to create

13 | Open challenges

1

Hardware

Glasses still bulky.

2

Content

3D assets take time.

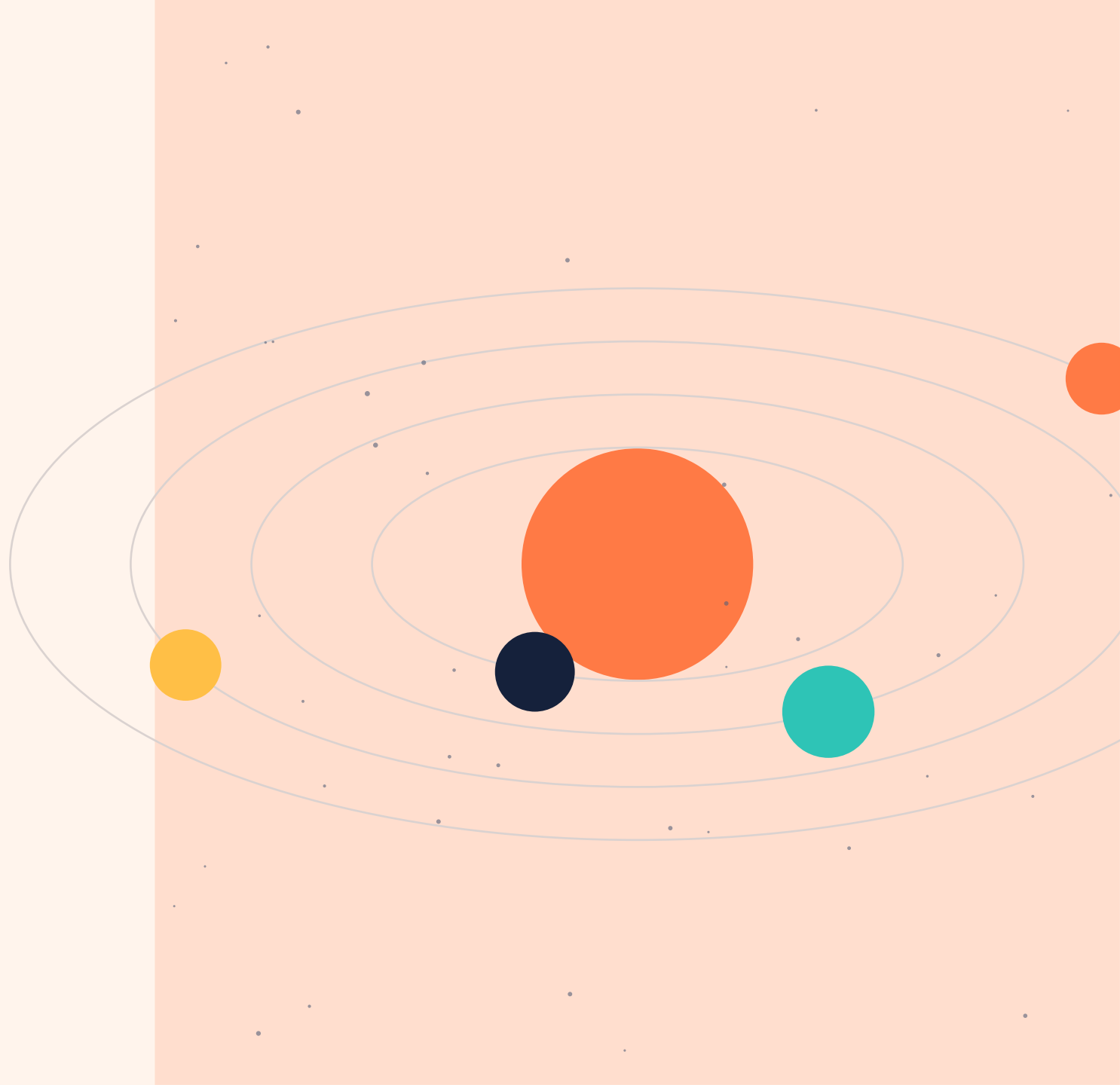
3

Privacy

Always-on cameras.

04

FUTURE



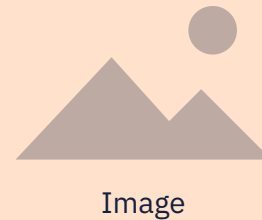


**Lightweight glasses
could make AR an
everyday interface.**

Looking ahead

16 | References

- [1] Survey paper on the topic, IEEE Access, 2024.
- [2] Textbook chapter covering fundamentals, 2023.
- [3] Recent conference paper on applications, 2025.
- [4] Industry white paper (generic reference).



Questions?

Thank you for listening.

Ishita Verma

Department of Computer Science

