INPUT LAYER

iPhone Camera
ARKit Framework
→ Raw Data →
Feature Points
Detection
→
Plane Anchors
Detection

Points

Planes

Data Acquisition
Module

PROCESSING

Grid to Terrain

Voxel Grid Manager
20×10×20 Grid

Geometry Data

Terrain
Analyzer

Classification
Engine

SceneKit
Renderer

OUTPUT
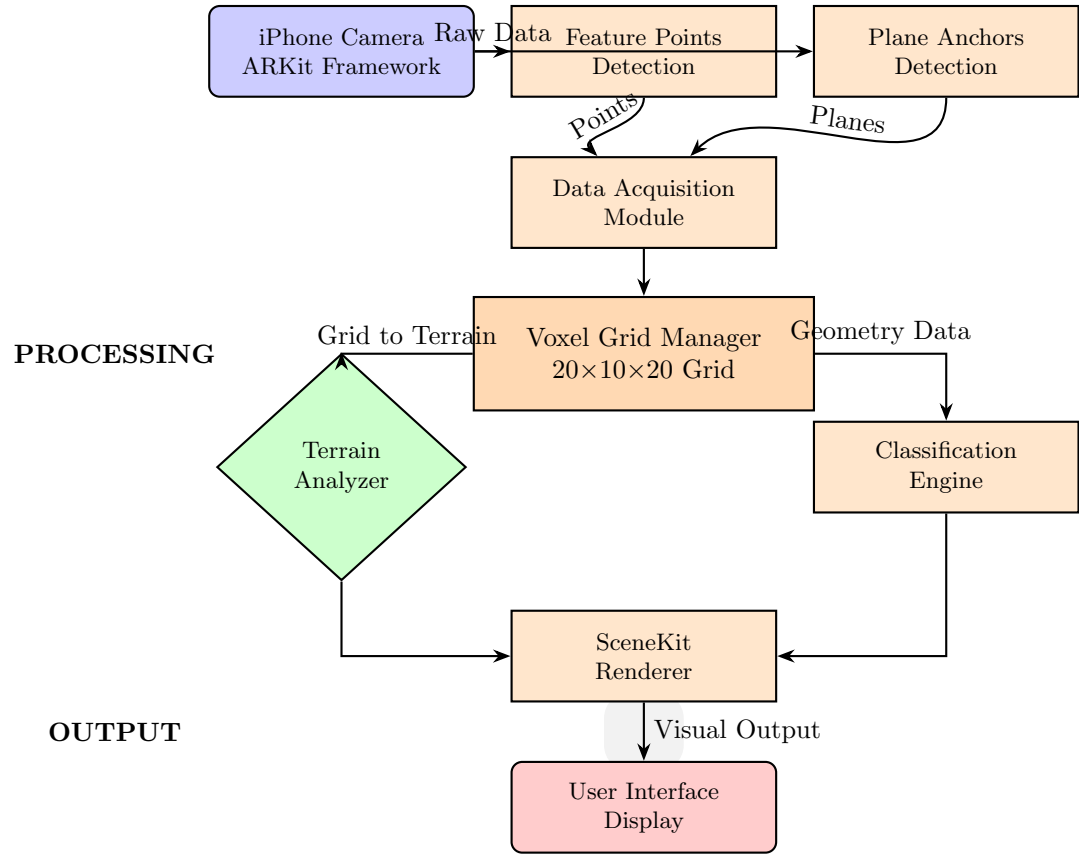
Visual Output

User Interface
Display

Figure 1: System Architecture Overview: Data flows from ARKit input through
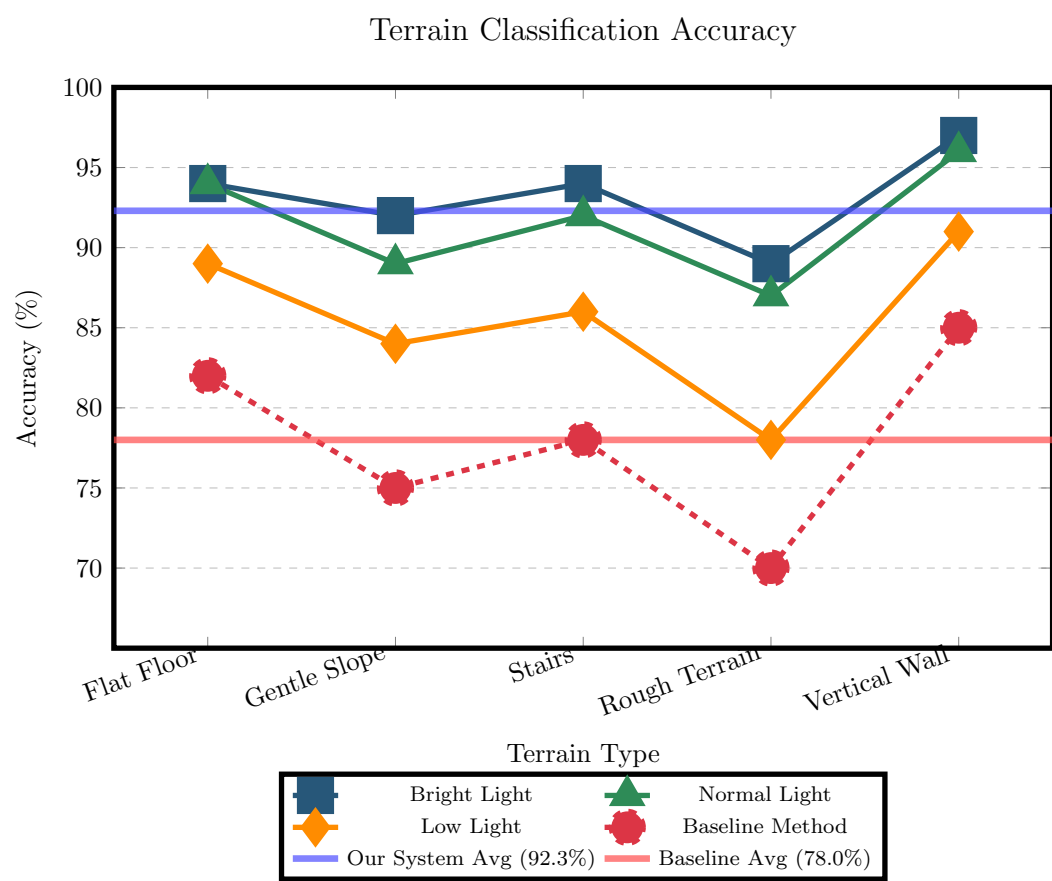processing layers to voxel visualization

Figure 2: Terrain Classification Accuracy: Performance metrics across different terrain types and lighting conditions