VERONICA

REFERENCE DESIGN

A REFERENCE DESIGN MODULE
FOR VR & ROBOT APPLICATIONS

INUITIVE

The VERONICA is a complete reference design hosting Inuitive's NU3000 3D Imaging and Vision Processor, designed to meet the challenges of HMDs and robots.

- ✓ NU3000
- ✓ IR CAMERAS WITH INUITIVE WFOV LENS
- ✓ I M U
- ✓ IR PROJECTORS
- ✓ TRACKING CAMERAS

USE CASES

- SLAM on-chip: implements the positioning, navigation, tracking, scene reconstruction on NU3000. Results in accuracy along with fast update rate and low power consumption
- Object recognition: runs object recognition algorithms to enable collision avoidance scheme
- Motion sickness reduction: minimizes the Motion-to-Photon latency without the need for cumbersome and expensive external sensors (such as a lighthouse)
- Gesture recognition: allow hands-based gestures as user interface

KEY FEATURES

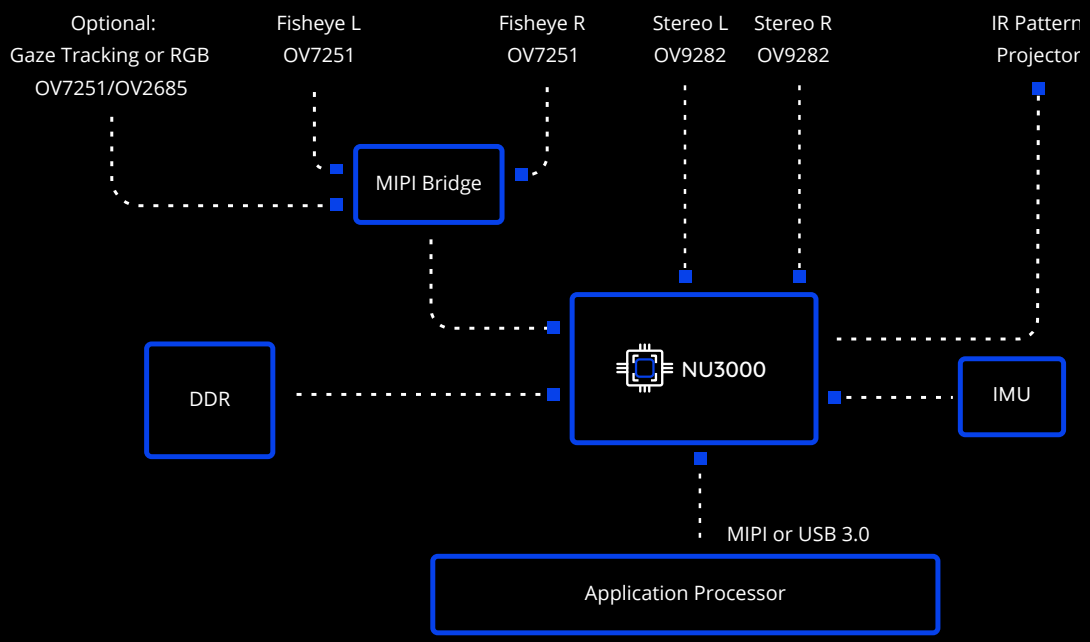
- High frame rate real-time depth map generation
- 6DoF (scalable to 9) pose estimation and feature tracking for SLAM (Simultaneous Localization and Mapping)

KEY BENEFITS

- Best fit for Head Mounted Displays - low power, small footprint
- Operates at all lighting conditions, from darkness to daylight
- Wide ecosystem of third-party technologies / applications to be used
- Active Stereoscopic IR cameras for Depth Sensing
- Supports Android, Linux and Windows OSs
- Wide Field of View (FoV)
- Seamless integration with customer-designed applications
- Configurable depth sensing range: (0.2 – 1) and/or (0.5 – 4) meters (using the 'Alternating Mode')
- System offload, enabled by DSP cores and a strong general-purpose processor, backed up with ultra-fast hardware accelerators
- Easy-to-use API

BLOCK DIAGRAM

The following figure illustrates a high-level block diagram of the Veronica and its interfaces:



KEY PARAMETERS

GENERAL PARAMETERS

PARAMETER	VALUE	UNITS	COMMENTS
Power consumption	670	mW	Depth only, 10FPS, 3 meters' maximum range
Module size – X	132.4	mm	
Module size – Y	27.4	mm	
Module size – Z	11.5	mm	
Minimum operating temperature	0	ºC	
Maximum operating temp	50	ºC	Ambient conditions are subject to system design

DEPTH IMAGE GENERATION

PARAMETER	VALUE	UNITS	COMMENTS
Sensor	Ov9282	N/A	2 Monochrome Sensors On Board
Max Sensor Resolution	1280x800	Pixels	Actual depth map size slightly smaller
Frame rate	60	Fps	60 is nominal for finger tracking. Sensor supports 130 fps (@720p), 180 fps (@VGA), and more.
Baseline	100	mm	
Minimum depth sensing range	0.2 / 0.5	M	0.5 – long range mode, 0.2 – short range mode
Maximum depth sensing range	1.0 / 4.0	M	4.0 – long range mode, 1.0 – short range mode
Depth accuracy at maximum range	1.5	%	At good SNR conditions
Max Field of view	120x90	º	
Depth map size	600X450	Points	HD Decimation

TRACKING

PARAMETER	VALUE	UNITS	COMMENTS
Sensor	OV7251	N/A	monochrome sensors on board 2
Resolution	640x480	Pixels	VGA sensor supports QVGA
Frame rate	Up to 100	Fps	@VGA Resolution
FOV	166.5	º	Fisheye
Baseline	64	mm	Use Lattice MIPI Bridge 2:1 to interface NU3000
IMU	BMI-160	N/A	6 DOF. Utilizes a gyro and an accelerometer, can incorporate an external magnetometer

SMART SENSOR HUB

The Veronica reference design performs real-time processing, capable of synchronizing, time-stamping and processing inputs from multiple sensors, hence serving as a **smart sensor hub**.

INUITIVE

For further information please contact us at info@inuitive-tech.com
or visit our website www.inuitive-tech.com