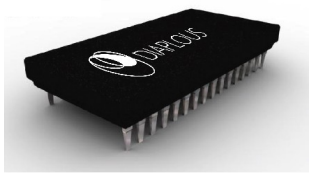
DIAPLOUS

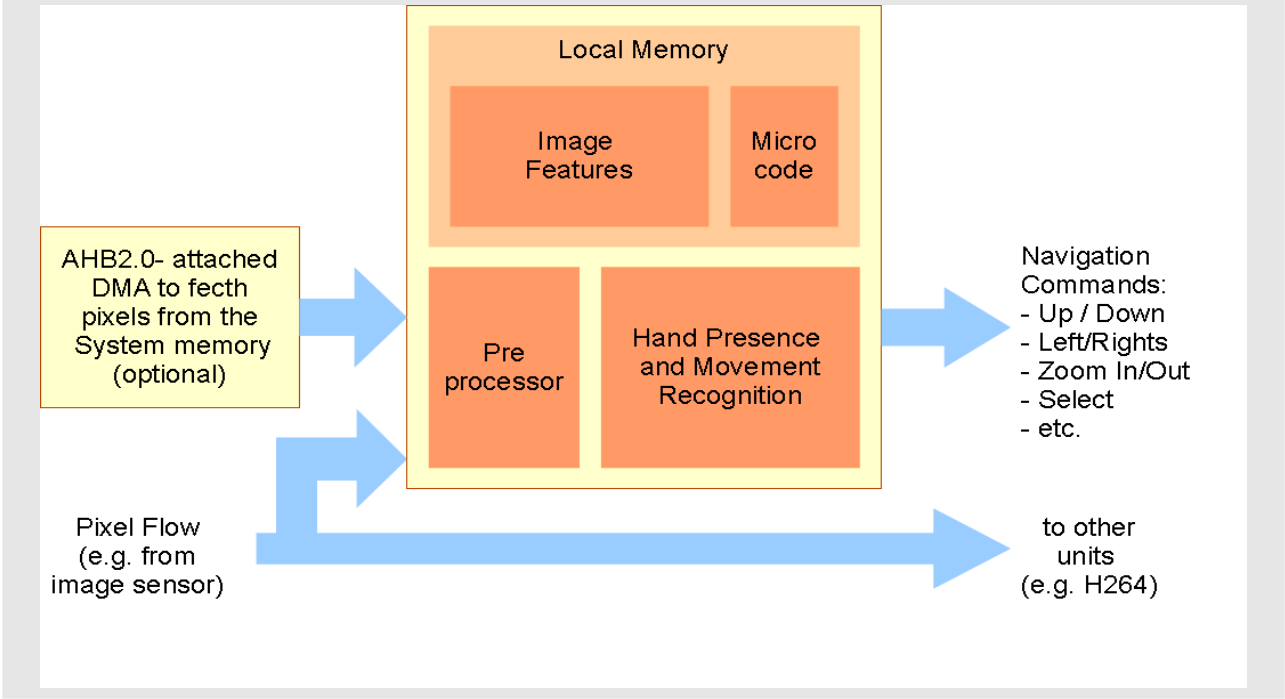
COMPONENTS FOR VISUAL PERCEPTION



Gesture-based Navigation Unit — Product Outline

An IP block that detects movement of hands for gesture-based navigation.

The DIAPLOUS Gesture-based Navigation Unit is a flexible IP core that reads an entire frame out of a flow of pixel data in RGB format and detects simple gestures of a hand that can control the navigation in graphical user interfaces. The Gesture-based Navigation Unit can be connected through a shared bus to a system memory or can work in parallel to the normal pixel flow in a camera system.



Input: The unit expects that the frame will be provided to it as a flow of RGB pixels, as they come out of an image sensor. If the frame is available on a system memory, there is an option to use a DMA device which generates a compatible pixel flow by accessing the memory through an AHB bus.

Preprocessor: The preprocessor is responsible for two tasks: (a) it modifies the input so that it is neutralized in terms of chroma, luminance and texture and (b) extracts features from the image that are used by the detector.

Local Memory: A small local RAM is required to store the image features. The same memory also holds the control flow of the detection algorithms (microcode).

Detector: The detector can be configured to analyze the image features and extract the following types of information:

Presence: Depending on configurable sensitivity settings the system can report if a hand is visible.

Location and Size: For the hand, the unit reports size and center position.

Movement: Reports whether the hand has moved significantly fast to any direction.

Navigation Command: The unit can be programmed to generate navigation messages for detected events.

Features:

- Integrated solution with no need for external processor to run part of the algorithms
- Configurable parameters
  - Speed of movement sensitivity
  - Hand Detection sensitivity
  - Output Commands
  - Command Rules
  - Input Resolution and Frame Rate
- Will work even in presence of faces or other hands in the visible image.

Speed: 10ms **(**typical / depends on implementation technology**)**

Interfaces:

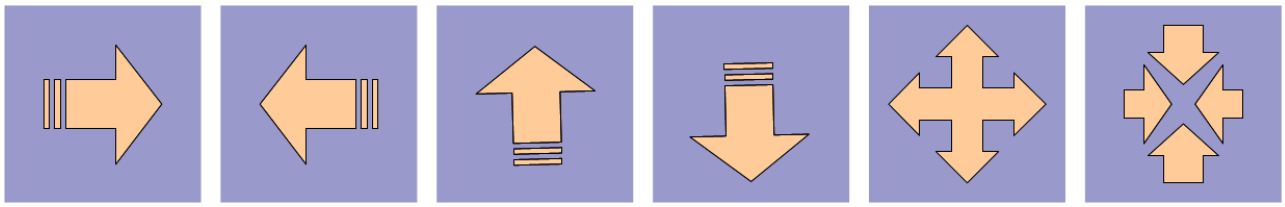
- Interfaces to Pixel Data
  - Pixel-flow Input
  - AHB bus Master
- Status/Control Registers
- Command Data Port

Target Applications:

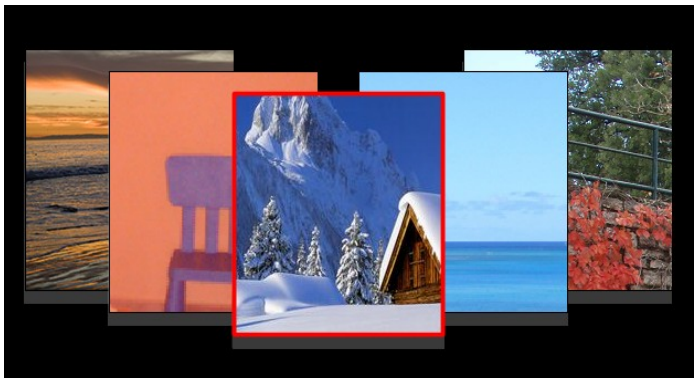
- Photo frames
- Access control
- Interactive Interfaces

Status:

Working FPGA Implementation



Typical movement patterns that can be detected as gestures by the system



Example Application

More info:

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