» To download your FREE copy of the Intel® Perceptual Computing SDK 2013 Beta or for additional information and resources, visit the Intel Visual Computing Source at: www.intel.com/software/perceptual

Intel® Perceptual Computing SDK 2013 Beta

Create a New World of Interactivity with Your Intel® Core™ Processor-Based Applications for Intel Platforms

Imagine a world in which you can grab a virtual 3D lump of clay and mold it mid-air into the flagship sculpture for your next art opening, recite your favorite Shakespearean sonnet in English and have it translated real-time for your friend in Shanghai, select and play your favorite tune with a mid-air flick of your hand or try on those cool new sunglasses that everyone seems to be wearing without leaving your PC. Perceptual Computing is about bringing exciting user experiences through new human-computing interactions such that devices sense and perceive the user actions in a natural, immersive, and intuitive way.

With the Intel® Perceptual Computing SDK 2013 Beta you can begin to create this world and usher in the next wave of visual computing interactivity. The Intel Perceptual Computing SDK enables you to create the next generation of immersive, engaging, innovative software applications that incorporate close-range tracking, speech recognition, facial analysis and 2D/3D object tracking on Intel® Core™ processor-powered Ultrabook™ devices and PCs.

Download the Intel® Perceptual Computing SDK 2013 Beta

The Intel Perceptual Computing SDK 2013 Beta is a free, downloadable software development kit supporting 2nd and 3rd generation Intel Core processors. High-level APIs provide developers with fast, easy programming access to perceptual computing functionality, while low-level APIs provide experienced developers the control needed for application innovation. Additionally, due to Intel forward compatibility, the code you write now will run on future platforms saving you valuable resources in the future. The SDK also supports the Creative* Interactive Gesture Camera, a small, light-weight, USB-powered depth sensor camera optimized for close-range interactivity powered by SoftKinetic* technology.

Supported Perceptual Computing Usage Modes

With the Perceptual Computing SDK, developers have access to the following usage modes, which can be used individually or combined to create unique, compelling applications and usages:

- Speech Recognition from Nuance*

- Facial Analysis

- Close-Range Tracking by SoftKinetic*

- 2D/3D Object Tracking from Total Immersion*

Additional Features of the Perceptual Computing SDK:

- **Usage-Mode Coordination:** With the Perceptual Computing SDK, applications can easily implement more than one perceptual computing usage mode simultaneously such as close-range tracking, facial analysis, and speech recognition.

- **Multi-Application Coordination:** The SDK manages sharing of the Creative* camera and other system resources so that users can switch seamlessly between perceptual computing applications.

- **Privacy Notification:** To protect the privacy of end-users, the SDK includes a privacy notification function that notifies end-users when the RGB and depth camera are switched on.

- **Extensibility:** The Perceptual Computing SDK was designed with the ability to easily add more usage modes in the future.

To learn more about how to download your FREE copy of the Intel Perceptual Computing SDK 2013 Beta or to find out how to purchase the Creative Interactive Gesture Camera, visit intel.com/software/perceptual.

The Intel Perceptual Computing SDK 2013 Beta supports the key perceptual computing usage modes speech recognition, facial analysis, close-range tracking, and 2D/3D object tracking.

Speech Recognition

Speech recognition is a common way to add perceptual computing interactivity to an application. Examples of this might be direct PC commands, dictation, or translation.

For speech recognition, when a user speaks to the Creative camera, the speech recognition algorithm in the SDK interprets the speech, recognizes that the user has spoken a command pre-programmed into the application, and passes the command on to the application. In the application shown below, the user can select the processor information by saying "i3", "i5", or "i7".

Facial Analysis

Face tracking can be used as a perceptual computing component in games or other interactive applications. The Intel Perceptual Computing SDK supports facial recognition, facial tracking, gender and age determination, attribution detection such as smile.

In the example shown below, the camera senses the user's face within the field of view, identifies the seven landmark points for the mouth, nose and eyes, and then tracks the face as her head moves.
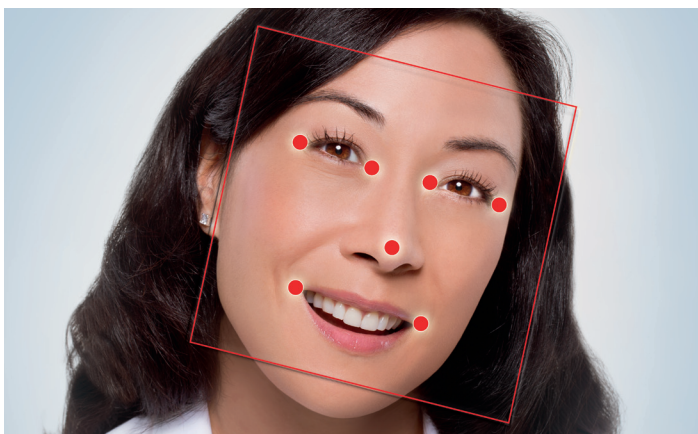
Close-Range Tracking

Close-range tracking is the overall term for a sub-category of perceptual computing interactivity that includes recognition and tracking of hand poses, such as the thumbs up, hand and finger tracking, and hand gestures.
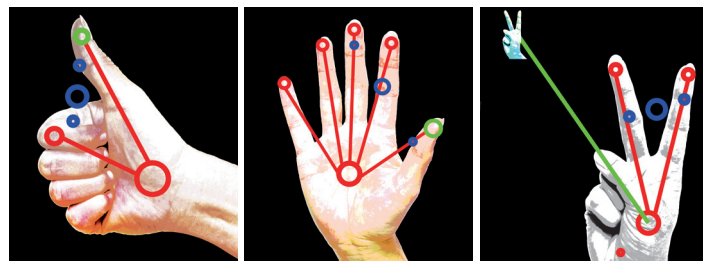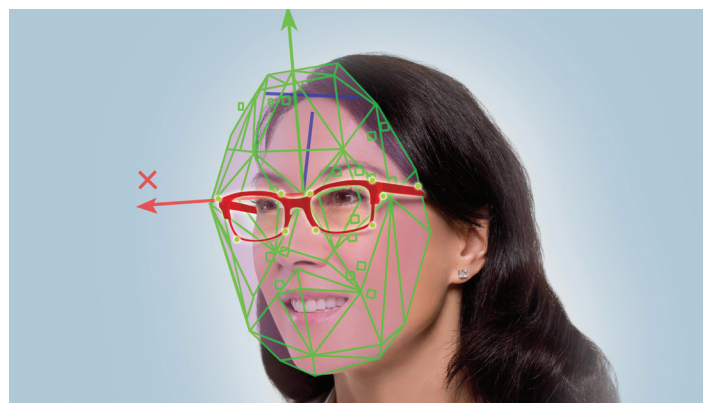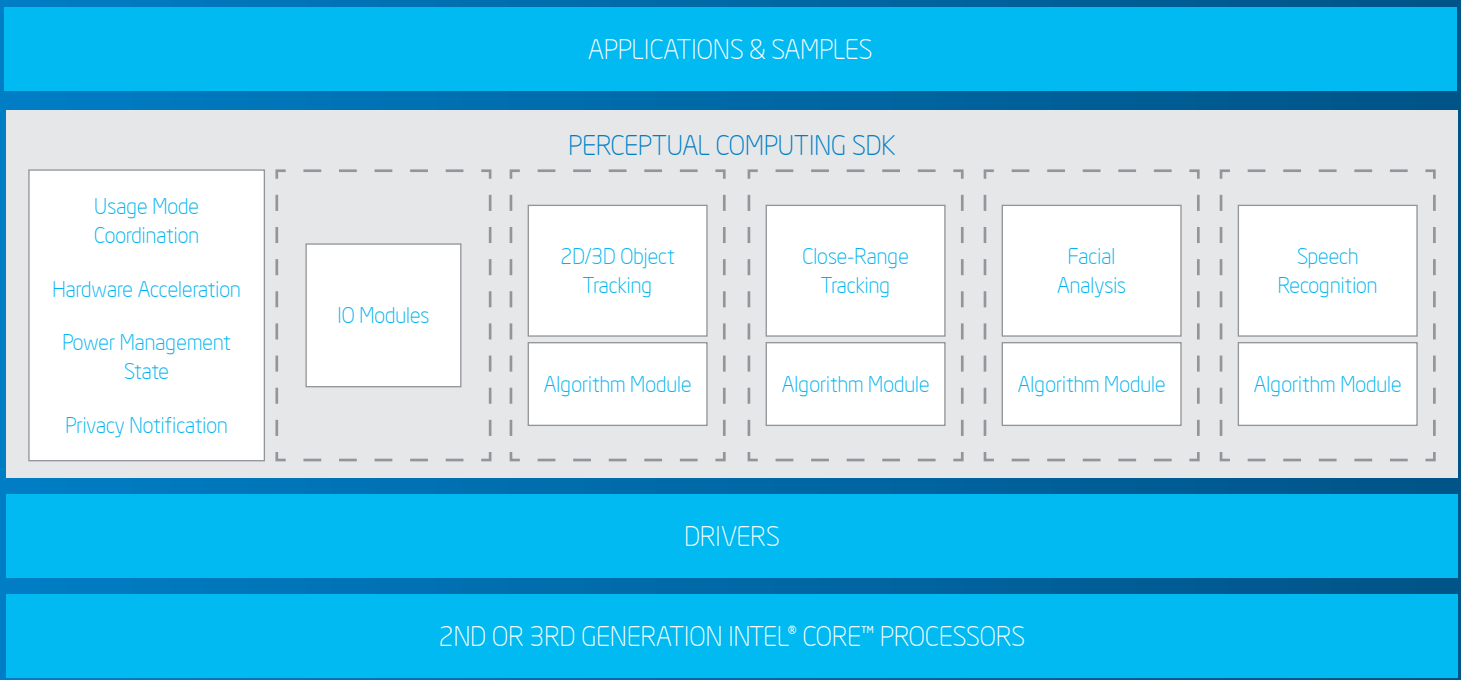

In the example shown below, the user's hand is recognized by the the close-range tracking algorithm of the depth camera allowing the user to turn the virtual doorhandle on the screen of the Ultrabook device. Close-range tracking is one of the most well-known and recognizable forms of perceptual computing and can be used for gaming as well as enhancing productivity.

2D/3D Object Tracking

2D/3D object tracking provides the user with an augmented reality experience in which real-time input from the Creative* depth sense camera (RGB video, depth map and audio) is combined with other graphics sources or video. In the example below, a woman is trying on a pair of glasses. The application recognizes the image of her face, her face is tracked in space, and the image of the glasses is superimposed on her face and then both the face and glasses are tracked real time.

INTEL® PERCEPTUAL COMPUTING SDK ARCHITECTURE

APPLICATIONS & SAMPLES

PERCEPTUAL COMPUTING SDK

Usage Mode Coordination	IO Modules	2D/3D Object Tracking	Close-Range Tracking	Facial Analysis	Speech Recognition
Hardware Acceleration		Algorithm Module	Algorithm Module	Algorithm Module	Algorithm Module
Power Management State					
Privacy Notification					

DRIVERS

2ND OR 3RD GENERATION INTEL® CORE™ PROCESSORS

The Intel Perceptual Computing SDK Architecture

The Intel Perceptual Computing SDK 2013 Beta development environment and library can help you quickly and easily start adding perceptual computing interactivity to your applications.

The SDK architecture consists of several layers of components (see diagram above). The I/O modules serve as data sources that retrieve data from input devices such as the Creative camera or data sinks that provide data to output devices such as a monitor. The algorithm modules implement the pattern detection and recognition algorithms that are critical ingredients of innovative human computer experience, such as facial analysis, gesture recognition, voice recognition, and text to speech. The SDK standardizes the interfaces of the I/O modules and the algorithm modules so that applications can access the functionalities focusing on the underlying implementations. Additional features provided by the SDK include:

- **Usage Mode Coordination:** Manages system resources so that each application can use individual modalities such as speech, tracking or face analysis or can combine multiple modalities.

- **Hardware Acceleration:** The SDK is compatible with other Intel Visual Computing SDKs, including the Intel Media SDK 2012, Intel SDK for OpenCL* Applications 2012/2013.

- **Power Management State:** Exposes the power management state of the device to algorithm modules so appropriate action can be taken.

- **Privacy Notification:** This service will inform end-users whenever an application turns on the Creative camera. This is important to alert end-users that their movements and images are being captured.

Supported Processors, Software, Samples, and Tools

Processors	2nd and 3rd Generation Intel® Core™
Operating Systems	Microsoft* Windows* 7 and 8 (32- and 64-bit)
Programming Languages	C++, C#
Microsoft Visual Studio*	VS 2008, VS 2010
Application Samples	Camera Viewer, Audio Recorder, Face Detection, Landmark Detection, Gesture Viewer
Supported Tools	- Total Immersion* D'Fusion Studio - Intel Media SDK 2012 - Intel SDK for OpenCL Applications 2012 - Processing* Open Source Programming Language and Environment - Unity* Game Development Environment

Creative Interactive Gesture Camera

The Creative Interactive Gesture Camera* is a small, light-weight, low-power camera that is tuned for close-range interactivity. Designed with ease of setup and portability in mind, it includes an HD web camera, depth sensor based on SoftKinetic technology, and a dual-array microphone.
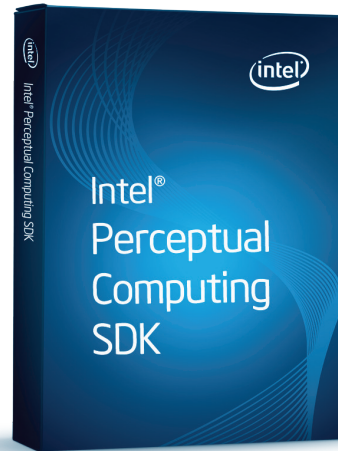
Specifications for the camera are:

- Maximum RGB Camera Resolution: 720p (1280 x 720)

- Maximum IR Depth Resolution: QVGA (320 x 240)

- RGB + Depth frame sync

- Frame Rate: 30 fps

- FOV: 73° diagonal

- Range: 6 in. to 3.25 ft.

- Dual-array microphone

- Size: 4.25 in. x 1.30 in. x 1.02 in.

- Weight: 7.41 oz.

- Power: Single USB 2.0 (power <2.5W)

The Intel® Perceptual Computing Website: Downloads, Code Samples, and Support

The Intel® Perceptual Computing Website (intel.com/software/perceptual) is a developer's one-stop shop for downloads, support and information for the Intel Perceptual Computing SDK 2013. You'll find free downloads of the SDK, software, code samples, product documentation, videos, links to twitter, Facebook feeds, blogs, and a support forum. In addition, you'll be able to sign up to purchase a Creative Interactive Gesture Camera.

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