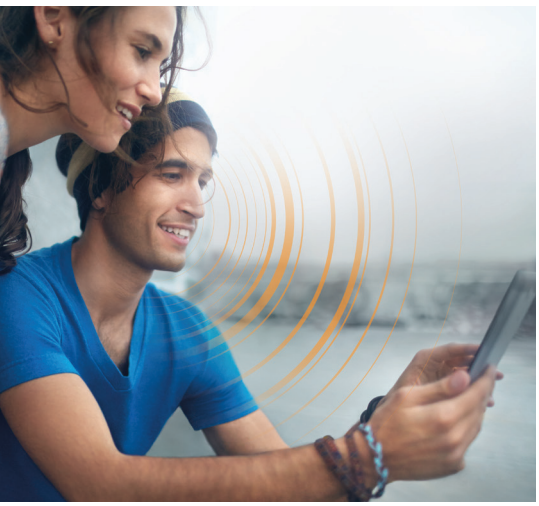
Product Brief
Intel® RealSense™ SDK for Windows Beta
Software Developer Tools

Intel® RealSense™ SDK for Windows Beta

Create Applications with Intuitive, Natural User Interfaces



The personal computer is decades old, but in all that time how personal has it really become? Do you interact with your computer the same way you interact with friends or family? Does it understand your communication style? Is it intuitive to work and play on a computer? At Intel, we're trying to make computers more personal, helping developers to create application interfaces that are truly natural, enabling computers to understand us the way we understand each other.

The Opportunity for Developers

Intel® RealSense™ technology recognizes and understands inputs using your hands, face, and speech, as well as from the environment around you. With the new Intel® RealSense™ SDK for Windows beta you can create the next generation of natural, immersive, and intuitive software applications that incorporate hand and finger tracking, facial analysis, speech, augmented reality, and 3D scanning. With these capabilities you can create applications in the following categories:

- **Immersive Collaboration:** Meet and collaborate, virtually.
- **Games:** Engage in and control gaming and play activities.
- **Natural Interaction:** Put intuitive control at your customers' fingertips.
- **Interactive Storytelling:** Bring storytelling to life with augmented reality, gesture, and more.
- **Capture and Share:** Scan, modify, and share small objects using 3D scanning. Works great with 3D printers.

These kinds of applications are possible on Ultrabook™ devices, notebooks, 2 in 1s, and All-in-One PCs with 4th generation and newer Intel® Core™ processors and the Intel® RealSense™ 3D Camera. Intel is working with major OEMs to integrate 3D cameras into many of these devices in an effort to give PCs human-like senses, making a more natural interface possible. For developers it means you have a great opportunity using unique hardware and incredible software to create your own cutting-edge applications and make them available to a broad user-base.

Download the Intel® RealSense™ SDK for Windows Beta

The Intel RealSense SDK for Windows Beta is an API and tools supporting 4th generation and future Intel® Core™ processors. It is available now as a free download. High-level APIs give all developers fast, easy programming access to Intel RealSense technology functionality, while low-level APIs provide experienced developers the control they need for application innovation. Download the SDK beta now for free at intel.com/realsense/sdk.

Intel® RealSense™ Developer Kit

Explore the capabilities of the Intel RealSense SDK for Windows beta with the Intel® RealSense™ Developer Kit camera. The Intel RealSense Developer Kit will be available for purchase in Q4 2014. An Intel-developed depth camera in this Creative*-designed peripheral device supports full VGA depth resolution, full 1080p RGB resolution and includes dual microphones. The Intel RealSense Developer Kit is an essential tool for developing applications using Intel RealSense technology. Reserve your Developer Kit camera now at intel.com/realsense/sdk.

The Intel® RealSense™ Technology Developer Resource Center

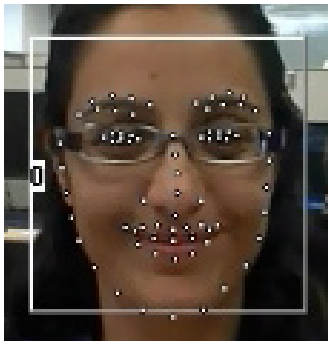
To help you get started developing applications quickly, check out the Intel® RealSense™ Technology Developer Resource Center, a one-stop resource for game and application development using Intel RealSense technology. At the Center you'll be able to download the Beta SDK, order a Developer Kit camera, enroll in the Intel® RealSense™ App Challenge 2014, and sign up to attend other developer programs and events like Hackathons, Virtual AE Sessions, and Webinars. To check out the Resource Center, visit intel.com/realsense/sdk.

The Intel® RealSense™ SDK for Windows Beta Supports Key Intel RealSense Technology Usages

Speech Recognition

Speech recognition is a common way to add natural interactivity to an application. Examples of this might be direct PC commands or dictation. The Intel RealSense SDK includes speech recognition algorithms from Nuance, a leader in speech recognition software, and also interoperates with Microsoft Speech API. Developers can select the engine to be used by their application.

When a user speaks into the microphones of a compute device, the speech recognition algorithm interprets the speech, recognizes that the user has spoken a command pre-programmed into the application, and passes the command on to the application to execute it.

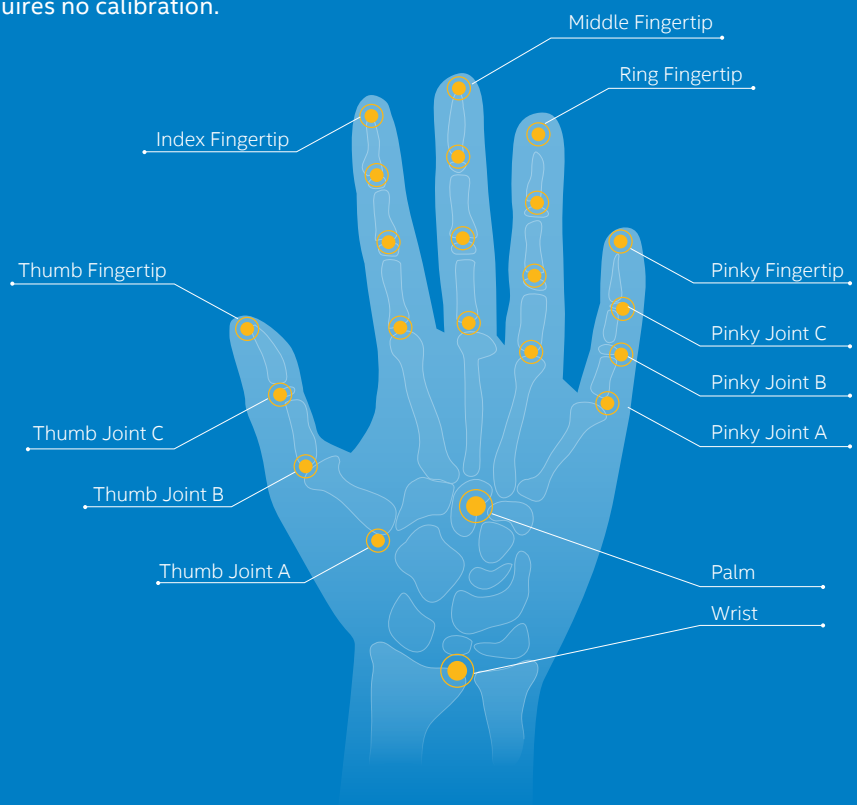


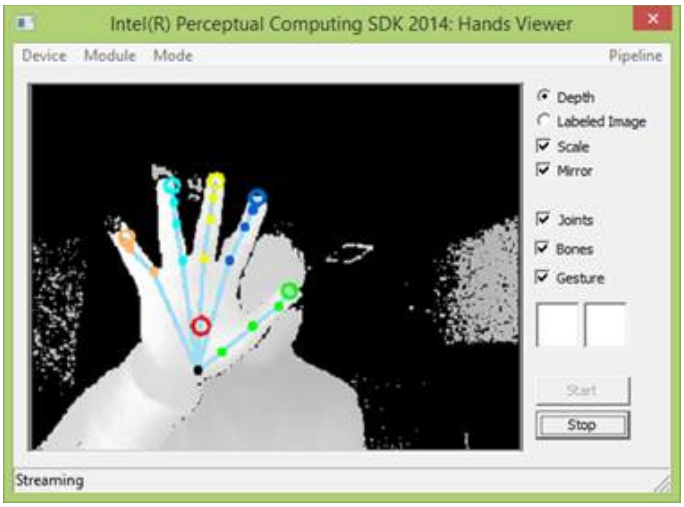
In 2014 the SDK supports tracking for 78 landmark points, depth for true 3D face detection as well as roll, pitch, and yaw.

Facial Analysis

Facial Analysis for 2014 now supports depth, and is able to track 78 landmark points for increased accuracy, true 3D face detection, as well as roll, pitch, and yaw of the face. These improvements allow you to identify the presence of faces in the camera's range, and on a single face identify the location of facial features. They also allow you to track and recognize a head pose and recognize expressions and emotions such as anger, surprise, and frustration based on these facial landmarks.

As part of the Intel RealSense SDK, you have access to a precise and accurate full-hand skeleton which segments the hand from the background and requires no calibration.





In 2014 the SDK tracks 22 points on the hand and joints.

Hand and Finger Tracking

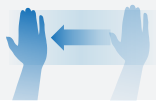
The Intel RealSense SDK supports recognition and tracking of mid-air gestures, hand tracking, and finger tracking within a range of approximately 0.2–1.2m or 6 in. to 3 ft.

Hand and finger tracking provides tracking or 3D positions of fingertips and palm locations that can be used to control an application within a range of 0.2–1.2m of the camera. This is useful for application developers who require the most sophisticated level of interactivity and want to define a unique means of user interaction for their application.

In 2014 the Intel RealSense SDK for Windows Beta now supports 22 points of hand and joint tracking for greater accuracy and resolution. This allows you to enable new application usages including more granular GUI control and better fingertip tracking and hand orientation for sophisticated interactions.

Gesture Recognition

Gesture recognition identifies static poses and dynamic gestures including grab, release, move, swipe, zoom in and out, push to select, hover to select, and escape/reset that act as a natural way to interact with software (see table below).

Grab and Release		Perform the pinch gesture to grab an object. Separate the thumb and index finger to release.
Move		While holding thumb and index finger together, move in x-y-z axes.
Swipe		Swipes can be performed in both horizontal and vertical directions parallel to the screen.
Zoom In /Grow		You can use Big 5 or 2 finger-pinch as the activation and completion pose. Zooming is coupled to the distance between the 2 hands (similar to pinch-zooming on touchscreens).
Zoom Out / Shrink		Same as zoom in, in the opposite direction.
Push to Select		Both are good designs to consider. Developers should choose a style that fits their app.
Hover Select		Hold open palm (Big-5) gesture still.
Escape/Reset		Wave an open hand from side to side naturally to reset or escape from an application mode.

Augmented Reality

Created in conjunction with augmented reality leader Metaio, 3D augmented reality allows developers to personalize, dramatize, and add emotional content to applications by creating a 3D virtual world and assign properties to virtual objects to make them "user aware."

3D Scanning and Printing[1]

Developed in conjunction with 3D Systems, Inc. the new 3D Scanning capability brings the ability to scan, modify, and share small objects to consumers. Here's how it works: because Intel RealSense technology uses a 3D camera, you can rotate an object in front of your computing device to build a 3D mesh. Overlay the mesh with color, and you've got a fully printable, shareable digital replica. Want to build some army men for your kids to play with? Great. Want to upload a 3D model of the teapot you're selling on an internet marketplace? Totally possible. Additionally, we're abstracting the technology so that developers can incorporate 3D scanning into their own applications. 3D Scanning will be included in a future release of the SDK.

Getting Started with the Intel® RealSense™ SDK for Windows Beta

Adding Intel RealSense technology interactivity to your application is now easier than ever with the new Intel RealSense Technology Developer Resource Center. Go to intel.com/realsense/sdk and:

1. **Get the SDK:** Reserve a Developer Kit: Download the SDK for Free and reserve a camera.
2. **Check out the Resource Center:** A one-stop shop for application development using Intel RealSense technology, you can get the help you need for developing applications quickly. You can also enroll in the Intel RealSense App Challenge 2014 as well as enroll to attend other developer programs and events like Hackathons, Virtual AE Sessions, and Webinars. The Resource Center includes a comprehensive documentation suite of Reference Manuals, a complete self-help course of tutorials, videos, and downloads of code samples.

Intel® RealSense™ SDK: Supported Processors, Software, Samples, and Tools	
Processors	4th generation and future Intel® Core™ Processors
Operating Systems	Microsoft Windows* 8.1 (64-bit only)
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* • Processing Open Source Programming Language and Environment • Unity Game Development Environment

Visit the Intel RealSense Technology Developer Resource Center today at **intel.com/realsense/sdk**

[1]3D Scanning and Printing is not available initially on the Beta but will be available later in 2014.

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