

## What's New in Version 1.20

1. Added 'Foreground texture'-setting to the BR-manager & 'Background texture'-setting to the background-rendering components, to get the image output as render texture.
2. Added Opaqueness-setting to the background-rendering components, to set image transparency.
3. Updated blob detector (BlobDetectionDemo-scene) to be more consistent across frames.
4. Fixed image mover and joint overlay in BackgroundRemovalDemo5-scene.
5. Fixed 'Keep last pose' behavior in AvatarController-component.
6. (1.20.1) Fixed issue switching to DirectML body-tracking processing mode for non-Nvidia GPUs (thanks to Kasey Cole).
7. (1.20.1) Added sorting of sensors' list by serial number, to avoid device number inconsistencies (thanks to Jonah Wintrich).

## What's New in Version 1.19.x

1. Added two new face demo scenes - hat overlay & show face image.
2. Updated BackgroundRemovalDemo2-scene with a new 'Apply sensor pose'-option.
3. Updated body-spin filter, to be configurable if the user faces forward, backward or changes direction.
4. Added IsInitFailed()-method to KM, to provide information if the sensor initialization has failed.
5. Fixed avatar-floating issue in AvatarController, when the user enters the scene in non-stand-up pose.
6. Fixed AvatarController repositioning issue for some models, when 'Apply muscle limits' is utilized.
7. Fixed and improved the feet detection in AvatarController, when 'Grounded feet' is utilized.
8. Fixed the reset of sensor pose in K4A-sensor interface, to avoid the extra camera tilt.
9. (1.19.1) Added support for Orbbec's Femto Bolt and Femto Mega cameras.
10. (1.19.2) Updated AvatarController to better handle muscle limits and offset nodes.
11. (1.19.2) Added 'Keep last pose'-setting to AvatarController, to keep the avatar pose after the user gets lost.

## What's New in Version 1.18

1. Added 'Start depth sensors'-option to KM, to allow scene startup without turning on the depth sensors (thanks to Marco Ciccotelli).
2. Added 3d-movie demo-scene (thanks to Hannes Rose).
3. Added display of user-body image on screen for different sensors.
4. Fixed background-image components, when sensors get stopped (thanks to Edgaras Art).
5. Fixed sharp avatar rotations in AvatarController-component (thanks to Moritz Skowronski).
6. Fixed sending Kinect data to multiple clients over the network (thanks to Guo Wei Leong).
7. Fixed merging of user-bodies in case of multiple cameras (thanks to Levent Alpsal).
8. Fixed wrong knee rotation, when 'Ignore Z-coordinates' is turned on (thanks to flymanbox).
9. Fixed estimations of shoulder and elbow orientations in some special cases.

10. Fixed mesh bounding box in SceneMeshRendererGpu & UserMeshRendererGpu-components (thanks to Benjamin King).
11. (1.18.1) Multiple updates and fixes in Kinect-related components, required by customers.
12. (1.18.1) Upgraded the project to Unity 2021.3.0f1 LTS.
13. (1.18.2) Updated net-client and net-server components to be more resilient to unstable networks.
14. (1.18.2) Fixed sensor pose estimation and the update of current frames in Azure Kinect interface.

## What's New in Version 1.17.x

1. Added 'Joint position smoothing' & 'Joint velocity smoothing'-settings to KM, to provide smoothing of joint positions and joint velocity calculations (thanks to matmat\_35 & Edgaras Artemciukas).
2. Added support of IL2CPP scripting backend to the Azure Kinect sensor interface (thanks to Jelvand).
3. Fixed the functionality of 'Show Allowed Users Only'-setting of KM (thanks to dbb0000).
4. Fixed the offset node to apply rotation in AvatarController (thanks to Martin Cvengros).
5. Fixed the ColorImageJointOverlay-component to work with ForegroundRenderer in BackgroundRemovalDemo5-scene (thanks to Mateusz Pomaski).
6. (1.17.1) Added support to Azure Kinect Body Tracking SDK v1.1.1.
7. (1.17.1) Added sample to display blurred color-camera background (thanks to Edgaras Artemciukas).
8. (1.17.1) Added sample to play multiple sequential recordings (thanks to Lasse Munk).
9. (1.17.2) Fixed the K4A-plugin, to utilize Azure Kinect BT SDK v1.1.1
10. (1.17.2) Added 'Save recording'-option to the device streaming modes, to save the live sensor data to recording-file (thanks to Mikhail Slobiskiy).
11. (1.17.3) Fixed the K4A-plugin, to utilize Azure Kinect BT SDK v1.1.2
12. (1.17.3) Fixed sensor-relative-position issue, when user bodies get merged across multiple sensors (thanks to 남대현).

## What's New in Version 1.16.x

1. Added support for Azure Kinect Body Tracking SDK v1.1.0 (big thanks to 葛西浩!).
2. Added optional bone colliders to the AvatarController-component.
3. Updated BackgroundUserBodyImage- & BackgroundColorCamUserImage-components to support individual user indexes (thanks to Tepat Huleux).
4. Fixed SceneMeshDemo and BackgroundRemovalDemo2-scenes to limit the space in camera coordinates (thanks to Tomas Durkin).
5. Fixed the dst/cst transfer issue in case of KinectNetServer running with ARKit sensor interface.
6. (1.16.1) Added 'Body tracking model type'-setting to the Kinect4AzureInterface-component, to allow switching between the full or lite body tracking models.
7. (1.16.1) Added KinectStatusChecker-component (thanks to Jess Deacon), and JointAngleCalculator-sample (thanks to Frank Fedel).
8. (1.16.1) Fixed body-merge issue in case of multiple RealSense sensors (thanks to Jorge Pelaez).
9. (1.16.2) Added 'Fixed step indices'-user detection order (thanks to Jasper Cook).
10. (1.16.2) Improved SwipeUp-gesture detection (thanks to Andy Cockayne).

11. (1.16.2) Fixed calculation of color & depth overlay positions in case of multiple sensors (thanks to Casey Farina).

## What's New in Version 1.15

1. Added experimental Apple iPhone Pro & iPad Pro ARKit sensor interface (available on request).
2. Updated RealSense sensor interface with Cubemos body tracking v3.0 (available on request).
3. Updated multiple scenes & components in the package, to cope with the mobile sensor requirements.
4. Updated FollowSensorTransform-component & UserSkeletonCollider-component, to allow matching of depth or color camera poses (big thanks to Max Ellinger).
5. Added DepthSpriteViewerMulticam-component, to apply sensor-specific body collisions (thanks to Kurt Lorey).

## What's New in Version 1.14

1. Added 2nd pose-detection scene, to demonstrate moving pose detection (thanks to Hogan Brown).
2. Added experimental Cubemos body tracking SDK support to the RealSense sensor interface (as separate download).
3. Updated the multi-camera setup scene and user-body-merger script, to provide better calibration of multiple sensors, as well as better merging of user bodies in multi-camera setups (big thanks to wangpeng, Juha Kauppinen and Janne Sormunen).
4. Updated 2d depth collider demo, to allow rotation of the depth collider (thanks to Vince Wloch).
5. Updated blob detector demo, to allow resizing of the background image (thanks to Jay Daligdig).
6. Added 'Portrait mode'-setting to the BodySlicer-component, to allow estimation of the body sizes, when the sensor is turned sideways (thanks to Fabian Wiedenstridt).
7. Added color-camera aligned user-silhouette background component, to allow color camera overlay (thanks to Max Jourdain).

## What's New in Version 1.13

1. Added 3<sup>rd</sup> overlay demo scene, to utilize the HandOverlayer-component (thanks to Edgaras Art).
2. Added photo-booth overlay demo scene, to demonstrate how to manage multiple joint overlays in 2D mode, gesture detection and hand grip interaction, all in one scene.
3. Added color-camera IR frame transformation API, to be used when needed.
4. Updated the scene-mesh and user-mesh scenes, components and shaders, to support HDRP & URP.
5. Replaced UserBodyBlender with SceneBlendRenderer-component in the fitting room demo-scenes, to support HDRP & URP (thanks to Fernando Gonzalez).
6. Updated the BackgroundRemovalByDist-component to support different max left & right distances (thanks to Mark Dodson).
7. Updated the AvatarController-comp. to use unscaled time for smoothing (thanks to Ruben Gonzalez).
8. Fixed 'Point cloud player list'-issue when using multiple sensors (thanks to Ashlee Lim).

9. Fixed BackgroundRemovalByBodyBounds-component in camera ortho mode (thanks to sukim).

## What's New in Version 1.12.x

1. Added two green-screen demo scenes and related components, to provide better background segmentation, with volumetric blending and lighting options (thanks to Clyde DeSouza).
2. Added 'Horizontal movement'-setting to the AvatarController-component, to allow in-place avatar movements (thanks to Lawrence Horwitz).
3. Added HmdHeadMover-component, to allow HMD-controlled avatar movement on VR platforms (thanks to Miguel Angel Cienfuegos Tellez).
4. Added optional frame synchronization between the master and subordinate K4A-devices.
5. Added 'Use synchronized samples'-option to the MultiCameraSetup-component, to allow camera pose estimation on synchronized frames (thanks to Jesse Kirberger).
6. Added MoveLeft & MoveRight gestures (thanks to Indra Adi D. C).
7. Updated most of the scene materials to support HDRP. Some custom shaders may still not work.
8. Updated SimpleHoloCamera-component to respect the camera pose (thanks to Ajay Kumar).
9. Fixed cursor position issue in the MouseControl-component (thanks to Fedor Savchenko).
10. Fixed canvas scaling issue in the InteractionManager-component (thanks to Raymond Tsang).
11. (1.12.1) Fixed the reported issues in v1.12 and improved the multi-camera setup.

## What's New in Version 1.11

1. Added experimental InteractionManager & InteractionInputModule-components, to manage user hand interactions (grip and release).
2. Added experimental interaction demo scenes, to show how to utilize hand grips & releases for interaction with virtual objects and UI.
3. Added SetSensorMinMaxIrValues() to KM, to set the values used for IR-texture generation (thanks to Carl Emil Carlsen)
4. Added EnableSensorPoseData() to KM to enable/disable the pose stream (thanks to Ruben Gonzalez).
5. Updated FollowSensorTransform to match the depth sensor pose (thanks to Fedor Savchenko).
6. Fixed the issue with persistent data-path, when called out of the main thread by NetClientInterface (thanks to Robert LiKamWa).
7. Upgraded K4A plugin to Azure Kinect Sensor SDK v1.4.0 & Body Tracking SDK v1.0.1.

## What's New in Version 1.10

1. Added DepthIrFilterDemo-scene, to show how to get depth-filtered IR image (thanks to Krystian Babilinski).
2. Added the BodySlicer-component and HeightEstimatorDemo-scene (thanks to Fernando Gonzalez).
3. Added HolographicViewerDemo-scene, to demonstrate simple holographic scene view.
4. Added 'Detect floor for pose estimation'-setting to the Kinect4AzureInterface-component.

5. Added FollowUserJointPose-component to allow first person experiences (thanks to 이상철).
6. Updated BackgroundRemovalManager to support multiple instances (thanks to Sangjin Lee).
7. Updated blob detector to respect different camera resolutions (thanks to Jay Daligdig).

## What's New in Version 1.9.x

1. Added user body merger, to merge the sensor-detected users, when multiple sensors are connected and properly calibrated (big thanks to Cy-Fighter LLC - <http://cy-fighter.com>).
2. Updated MultiCameraSetup-scene to provide manual adjustment of the camera poses, after the automatic pose estimation is complete.
3. Added depth-color and body-depth frame synchronization to the net-client sensor interface.
4. Added automatic net-server discovery option to the net-client sensor interface (LAN only).
5. Added KinectEventManager-component, to deliver frame events to the registered listeners.
6. Updated thread waiting times, to lower CPU utilizations (thanks to Sheng Jiang).
7. Moved background-removal-by-body-bounds filter to separate component.
8. (v1.9.1) Added 'Loop playback'-setting to the K4A-interface (thanks to Vincenzo Lancianese).
9. (v1.9.1) Updated to Azure Kinect Body Tracking SDK v1.0.0.
10. (v1.9.1) Many small fixes and updates in various scripts, components and scenes.
11. (v1.9.2) Added methods to KM, to start and stop the depth sensors (thanks to Tom Goethals).
12. (v1.9.2) Added 'Console log messages'-option to KinectManager (thanks to cecarlson).
13. (v1.9.2) Updated MultiCameraSetup, to utilize multiple body joints and motion smoothing.
14. (v1.9.2) Added 'Point cloud player list'-setting to the sensor interfaces, to allow filtering of bodies by the point-cloud vertex shader (thanks to Vincenzo Lancianese).

## What's New in Version 1.8

1. Updated to Azure Kinect Body Tracking SDK v0.9.5 with multiple instance support.
2. Added MultiCameraSetup-scene, to automatically detect the positions and rotations of the sensors in a multi-camera setup.
3. Added 'Use multi-cam config'-setting to KinectManager, to utilize the sensor configuration, as saved by the MultiCameraSetup-scene.
4. Implemented simple fusion of the body joints, when multiple calibrated cameras are used.
5. Added BackgroundRemovalDemo3-scene and BackgroundRemovalByBodyIndex-component, to filter users by the detected body indices.
6. Added compression and decompression of the raw data frames in net-server and net-client interface.
7. Updated the classic mesh renderer scripts, to build the mesh in a separate thread and to support color camera resolution (thanks to N. Naydenov & G. Martini).

## What's New in Version 1.7.x

1. Added KinectNetServer-component to share sensor streams over the network, and KinectNetServer - scene to act as network server for the connected sensor.
2. Added NetClientInterface-component to receive the sensor streams over the network, as well as NetClientDemo1-demo to show the network sensor functionality.
3. Added 'Finger orientations'-setting to AvatarController, to determine whether the model should reflect the user's finger orientations or not.
4. Added 'Mesh texture'-setting to SceneMeshRendererGpu & UserMeshRendererGpu components, to select between the color and infrared textures (thanks to Alan).
5. Added UserSkeletonCollider-component to UserMeshDemo-scene, to provide collisions with physical objects (thanks to Daniel Gontz).
6. Fixed "missing hands" issue, when the user is far from the sensor (thanks to Nayden).
7. Added caching of space tables, to improve the scene load time (thanks to Gianluca Martini).
8. (1.7.1) Updated KinectNetServer & NetClientInterface to exchange transformed depth & color frames.
9. (1.7.1) Fixed user-tracking bug in Kinect2Interface and AvatarMatcher-script (thanks to Hao Tseng).
10. (1.7.1) Added 'Users face backwards'-setting to Kinect2Interface (thanks to Leif Dehmelt).

## What's New in Version 1.6

1. Added BackgroundRemovalDemo4 scene, to show how to display virtual environment within the user's silhouette.
2. Added BackgroundRemovalDemo5 scene, to demonstrate how to display the user's silhouette in a 3d scene, according to the user's distance to the sensor.
3. Upgraded K4A plugin to Azure Kinect Sensor SDK v1.3.0 & Body Tracking SDK v0.9.4. Updated sensor interfaces to support the new hand-related joints, as well as the joint tracking states.
4. Added 'Ignore inferred joints'-setting to the KinectManager-component, to determine whether to consider or ignore the inferred joints.
5. Updated SceneMeshDemo & UserMeshDemo-scenes to undistort the mesh and to apply scene lighting (big thanks to Alan & Gianluca Martini).

## What's New in Version 1.5

1. Added BodyDataRecorderDemo scene, to show how to record and replay the user body data.
2. Added PlayerDetectorDemo scene, to demonstrate how to play a recording, when no user is present.
3. Updated SceneMeshDemo scene, to create and update the scene mesh on GPU instead of CPU.
4. Updated UserMeshDemo scene, to create and update the user mesh on GPU instead of CPU.
5. Fixed model's head rotation in the AvatarController-component (big thanks to N. Naydenov).

## What's New in Version 1.4

1. Added MoCap-Animator demo scene, to demonstrate motion capturing into Unity animation.
2. Added SceneMeshDemo scene, to show how to integrate part of the real environment into the scene.

3. Added UserMeshDemo scene, to show how to integrate the user into the scene.
4. Added 2<sup>nd</sup> background-removal demo scene, to demonstrate how to display part of the real environment on virtual background.
5. Updated K4A plugin to use Azure Kinect Body Tracking SDK 0.9.3.

## What's New in Version 1.3

1. Added background-removal demo scene, to show how to display user bodies on virtual background.
2. Added pose detection demo scene, to demonstrate how to detect the user matching static pose.
3. Added infrared image texture as an option of getting IR frames and displaying them on screen (big thanks to [Gianluca Martini](#)).
4. Updated K4A plugin to use the Azure Kinect Body Tracking SDK 0.9.2.
5. Fixed K4A interface issue, when the device's sync mode is Master (big thanks to [Andreas Pedroni](#)).

## What's New in Version 1.2

1. Added two fitting-room demo scenes, to demonstrate humanoid model overlays.
2. Added experimental RealSense body tracking. It's in preview state, far from perfect yet.
3. Added horizontal, vertical & forward offset settings to the JointOverlayer-component, to allow better adjustment of the overlaying object.
4. Added more visual effects to the point-cloud demo scene.
5. Updated K4A plugin to Azure Kinect Sensor SDK 1.2.
6. Fixed setting of K4A color and depth modes that require 15 fps.
7. Fixed play-recording in the Azure Kinect interface.

## What's New in Version 1.1

1. Replaced DepthEngine 1.0 with 2.0, to conform to Azure Kinect Sensor SDK 1.2.
2. Added two gesture demo scenes, to demonstrate discrete and continuous gesture tracking.
3. Added multi-scene demo, to show how to use the KinectManager in multi-scene projects.
4. Added 'Point cloud resolution'-setting to the sensor interface components, to allow depth-to-color and color-to-depth image conversions.
5. Added IMU rotation tracking and FollowSensorTransform-component, to allow sensor pose tracking.
6. Fixed AvatarController issue that caused the model to freeze, when the user ID changes.
7. Multiple updates, improvements and bug fixes, reported by the users.