

Release Notes Evoke 1.3.0

Evoke

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1 New Features

1.1 Object proximity grouping

Pulsar is limited to a maximum of 70 unique patterns. This feature allows more than 70 Pulsar objects to be tracked, using *proximity groups*. A proximity group defines a number of objects in close proximity, at least one of which has a unique pattern. The other objects may be assigned to *template groups* in order to share a pattern. Evoke determines which object is which in a template group by its proximity to a unique object in its proximity group. This greatly increases the number of Pulsar objects that may be tracked simultaneously, provided that a suitable distance can be maintained between different proximity groups. See documentation for detailed usage instructions.

1.2 Auto-assignment for Characters from Clusters

This feature is aimed at streamlining the operational requirements for using characters from clusters. Manually assigning every object to the correct character and slot is no longer necessary. Each character now requires at least one *reference cluster* to be manually assigned to the correct slot, others may be left empty. The remaining clusters may be designated as *auto-assignable*. When the character is calibrated, these clusters will be automatically assigned to the correct character slots. After the experience, the character calibration can be cleared, returning the auto-assignable clusters to the unassigned pool. This is advantageous in terms of labeling and device management. Whilst it is still necessary to label reference clusters according to a specific character and body part (e.g. Player1_Head), the others may be labeled generically according to the body parts they may be placed on (e.g. Backpack1, EndEffector1). The generic clusters can be placed on any character and matching body part.

Auto-assignment of clusters may also be used without character solving or retargeting, if only object tracking is required. This option may be found in the Processing panel, under 'Characters From Clusters | Disable Solving'.

1.3 Halve Processing Rate Post-Centroid Tracking

This new option in the Processing panel may help when tracking a large number of objects. Normally it is necessary to reduce the system frame rate when the system is heavily loaded, in order to avoid dropping frames. With this option it is possible to keep the system frame rate high, but reduce the rate of subsequent processing (e.g. object and character tracking). This may improve tracking quality, particularly for fast movements.

- 2D centroid detection always happens at system frame rate
- Subsequent processing depends on the value of 'Halve Processing Rate Post-Centroid Tracking'
 - When disabled (the default), every frame is processed as normal
 - When enabled, every other frame will be dropped after centroid tracking (yielding a tracking rate of 1:2)
- DataStream clients need to be aware of this setting, since there is an expected level of frame dropping with this option enabled

1.4 Updated radio pairing dialog

This dialog is available from the context menu option for Beacons, in the System panel. The update focuses on improved support for multiple Beacons, and a more streamlined interface.

- The radio host list now shows the number of clusters paired and connected to the host
 - It is important to balance the number of clusters connected to each host. Too many clusters connected to one host will reduce connection stability, and increase the time required to send commands to all clusters
- Each radio host has its own list of assigned clusters
 - A cluster is assigned to a host when paired to it, or added to its whitelist
 - A right-click context menu allows operations on one or more selected clusters
 - Add to or remove from the selected radio host whitelist
 - Clean the whitelist (remove any clusters from the selected radio host whitelist that are paired to another radio host)
 - Unpair
 - Transfer (pair) to another connected, enabled radio host
- A separate list of unassigned clusters keeps track of connection or pairing requests, and clusters which have been unpaired
 - This list persists for the lifetime of the application session, and the time of last contact between the application and the clusters is recorded
 - A right-click context menu allows one or more selected clusters to be added to the selected radio host whitelist
 - In the case of pairing requests, pairing must also be started in order to allow the cluster to connect
- A button has been added to automatically load-balance clusters
 - This transfers the connected clusters so that an equal number is connected to each host

1.5 System health reporting

System health reports are now available via Evoke API. Starting a report begins collection of camera detection data, which may be analyzed and compared with previous reports to find problems with system setup or camera calibration.

To assess system health, all cameras need to see marker data moving across their fields of view. Ideally the data should be consistently repeatable; this will make it easier to compare reports and make decisions on what action to take.

For monitoring over time, the report values can be compared to 'known good' baseline values, when the system was known to be set up well. 'Good' values for system health reports will vary according to volume, system setup and typical movement of tracked subjects.

1.6 Camera orientation detection

View frames in the Cameras Workspace view can now be rotated to match their physical orientation, so that up in the image matches up in the real world. The orientation will be determined from the camera calibration if available, otherwise the accelerometer on board the camera will be used.

This option is enabled by default, and can be found in View Filters | 2D Data | Show Orientation. There is an additional option to snap to 90° increments, ignoring smaller rotations.

1.7 Selected marker count

An option has been added to the 3D Scene Workspace view to show the number of markers selected (View Filters | Overlays | Selected Marker Count). This may be used to quickly check that all markers on a particular target are visible.

1.8 Tracking filter buttons

Filter buttons have been added to the Tracking panel, to allow showing/hiding different types of tracking items.

2 Changes

- The Vicon Skeleton file format (*.vsk, *.vsr, *.vss, *.vst) has been updated to 3.5.
 - Older versions of Retarget (1.0.x) will not work with Evoke 1.3, as they cannot load the new source skeleton file
- Object presets are now stored in the tracking MCP file rather than the system file (e.g. C:\Users\Public\Documents\Vicon\Evoke1.3\LastRun\\Subjects.mcp)
- Removed the log panel filter buttons. The message filtering could cause unacceptable performance problems if the volume of log messages is very high (for example, if there are persistent problems with receiving camera data)
- Improved reliability of character calibration and scale estimation
 - Better handling of foot orientation when there is a significant deviation from the expected pose. Typical causes include:
 - Person pointing their feet inward or outward rather than straight forward
 - Clusters placed at an angle on the feet
 - Footwear with raised heels
 - Better scale estimation, as the spine cluster is now ignored for this purpose. Its placement (on a backpack or backstrap) tends to be more variable than the other clusters.
- Characters from clusters always show slot names
 - When an object is manually assigned to a slot, it is renamed to match the slot name
 - When an object is automatically assigned to a slot it is not renamed, and both are shown in the Tracking tab and 3D scene Workspace view
 - The DataStream subject name does change when auto-assigned, so there is no difference in the DataStream between objects manually or automatically assigned to character slots
 - Auto-assignable objects cannot be manually assigned or unassigned
 - Empty slots now only generate a warning if there are more empty slots in total than there are auto-assignable objects
- The color of basic objects is now editable
- Smart object marker patterns are read-only when 'Automatically manage smart object patterns' is enabled in preferences
- The dialog for removing items from the Tracking panel is more context-sensitive
- The Cameras Workspace view outlines camera panes in red if the camera is disconnected
- Added Help menu option to manually trigger a check for firmware updates
- Sample Vicon retarget files and skins have been added, replacing the Unreal Engine Mannequin sample

3 Fixes

- Fixed crash when opening a file dialog in Evoke in Windows 10 version 1903, OS build 19013.1122 or later
- Fixed crash when attempting to calibrate with Evoke Headless
- Fixed intermittent crash when calibrating with a sub-sampled Vue camera in the system
- Fixed rare crash when selecting an item in the Tracking panel
- Fixed rare crash when shutting down while starting a new sync session
- Fixed rare crash when stopping capture due to sync discontinuity
- Fixed fatal error after calibration when there is a Vue camera in the system
- Fixed basic objects failing to track when they are given the same name as a deleted smart object
- Fixed smart object objects losing their 'Markers On While Charging' parameter value when they are assigned during character creation
- Fixed object presets not being correctly updated when presets are removed
- Fixed some instances where cameras could fail to calibrate but not update image error, resulting in misleading information in the Camera Calibration tab
- Fixed Workspace View Filters not loading properly on start
- Fixed 'expand category' arrow in System panel not rendering properly in remote desktop or with '--force-gles' flag on command line
- Timecode is now correctly recorded in X2D files
- Evoke API fixes:
 - Fixed CameraCalibrationServices not accepting 0 as a wildcard session id for stop/cancel operations
 - CameraCalibrationServices.SetOriginProgress now returns more detailed error information when the system isn't able to set origin
 - Fixed CameraCalibrationServices.WandWaveProgress only including data for the current operation (i.e. image error missing when collecting wands, wand count missing when computing calibration)
 - Fixed CaptureServices.SetCaptureName accepting invalid capture names
 - Fixed ClusterDeviceServices.Reboot and RebootAll attempting to reboot cameras rather than clusters

4 Evoke API 1.7.1

- Added BasicObjectServices. This supports management of basic objects.
- Added CameraCalibrationServices.SetFloorExtents, StartRecoverCameraPosition, StopRecoverCameraPosition, and CancelRecoverCameraPosition.
- CameraCalibrationServices: added more error codes to ESetOriginReadyState.
- CharacterFromClustersServices: added retarget functions and character warnings.
- SmartObjectServices: added auto-assign enabled and auto-assigned name parameters. Added object proximity grouping warnings.
- Added SystemHealthServices. This supports reporting on data quality, which may be used to detect or diagnose problems with the system.
- Added Python 3 support.

5 Vicon Core API 1.1.8

- Added support for Python 3

6 Retarget 1.1.2

- Added support for the Vicon Skeleton 3.5 file format. Retargets created in Retarget 1.1.2 will not be usable in Retarget 1.0.x or Evoke <= 1.2.x.
- Added label indicating which retarget file is currently loaded
- The *State X*, *State Y* and *State Z* fields for rotation targets are now read-only, as the axis-angle representation should not be modified by hand
- *Remove unnecessary joints* now removes all joints without a direct constraint. Previously, it would preserve any joints that are either directly constrained, or have constrained child joints.
- Local bone poses will be correct with respect to original skeleton, when exported from Shogun Post to FBX and merged.

7 Pulsar Reprogramming Tool 1.0.4

- Fixed intermittent crash on rebooting Pulsars