

VICON / LIFE SCIENCES

THEIA MARKERLESS MOTION CAPTURE



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A RANGE OF MOTION CAPTURE TOOLS BY **VICON**

Markerless joins Optical and Inertial: three tracking solutions within one dynamic ecosystem.

Markerless tracking, powered by Theia3D, for biomechanics, clinical gait R&D and sports science opens up new ways for researchers, practitioners and coaches to capture movement in both the field and the lab using Vicon technology.

Theia Markerless can now be combined with Vicon's optical tracking - you also have the option to integrate Vicon's Blue Trident inertial sensors - to become part of an ecosystem that gives you the flexibility to capture and analyze data in the way that works best for you. The addition of Markerless tracking to your Vicon system enables you to capture otherwise technically challenging sports and functional sports assessments.

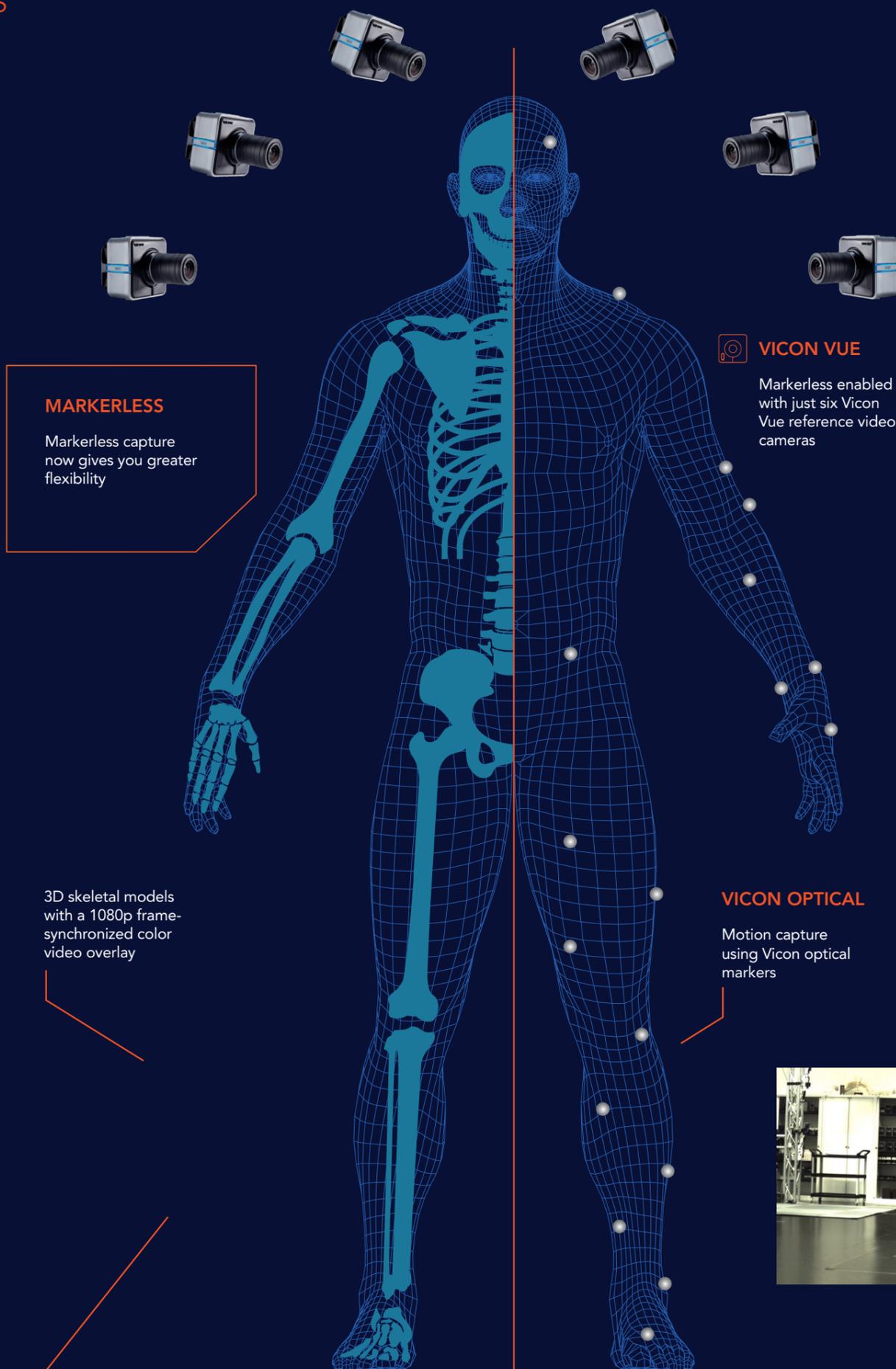
Within Vicon's Nexus 2.12 the synchronised video capture process is automated, allowing you to easily capture multiple trials in the lab or in the field and maximize the value of your session. Then, post-capture, use the native connection between Vicon Nexus and Theia to auto-process Theia's markerless algorithms over the videos and export its 3D outputs back into Nexus.

The user can choose to use Vicon ProCalc 1.5 to generate joint data or to export results into Visual3D, Python or MATLAB for further analysis.

For even deeper insights, users can also compare the markerless outputs to the gold standard data provided by your Vicon optical and inertial system, within Nexus and beyond.

By removing markers from your setup, subjects can be monitored outside the constraints of a typical lab environment. This means athletes can be recorded performing any action where they move most naturally: out in the field, without limits, all while knowing the markerless data can be compared to the gold standard optical data from within the lab.

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HOW DOES IT WORK?

Starting with a minimum of six Vicon Vue reference video cameras, users can track multiple subjects at once, scaling up the size of their capture volume with additional units in the lab or out in the field. For optimal results use eight or more Vue cameras.

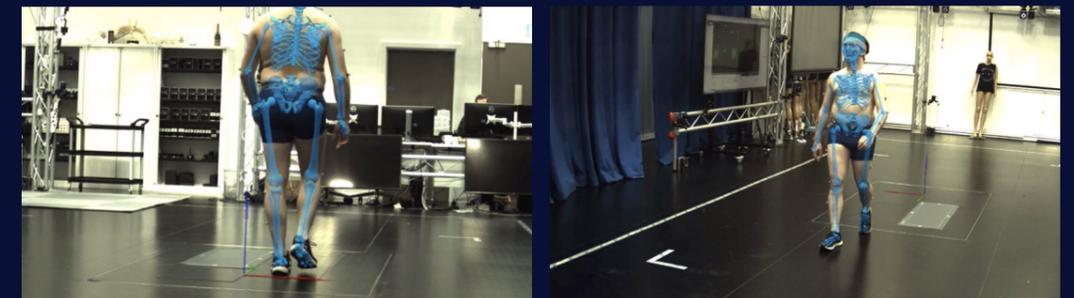
Use Nexus 2.12 to capture video data, simultaneously running optical and IMU if desired. Nexus records uncompressed video files, allowing the user to make their own compression choice and allow for future codec capability by Theia.

Once a capture session is complete, the user chooses the desired codec and Theia settings within the Nexus pipeline tool and a single click allows multi-file batch processing.

From here the user has multiple choices:

- Utilise Vicon ProCalc to process the C3D file type from Theia into kinematic outputs for viewing within Nexus.
- Merge the Theia data into the Nexus C3D and run the Theia ProCalc scheme to generate all joint data and directly compare markerless and optical.
- Process the data using Nexus's native Python and MATLAB features.
- Use the Nexus and Visual3d integration to send and review the data from within the C-motion platform.

Because Markerless works using Vicon Vue, you can view 3D skeletal models with a 1080p frame-synchronized color video overlay, as exported by Theia. Theia can run video data at the same frame rate as Nexus, although it does not need to match. For more granular analysis, use Theia3D's built-in joint and segment angle viewer to focus on inverse kinematics or export the data to a C3D file.



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