

A young boy is captured in a dynamic pose, performing a martial arts move. He is shirtless and wearing dark blue shorts with a red and white logo on the left leg that reads "2018". He has several small black motion capture markers attached to his head, neck, chest, arms, and legs. He is standing on a dark floor with a green grid pattern. The background is dark blue with a large, semi-transparent orange and red geometric shape. The text "BEYOND MOTION" is overlaid in white, bold, sans-serif font across the center of the image.

BEYOND MOTION

THE MOST TRUSTED MOTION CAPTURE ECOSYSTEM, INSPIRED BY YOU

Over 90% of our product enhancements are driven by direct customer feedback, creating a software designed specifically for the life science community. **Nexus delivers precise, repeatable and clinically validated model outputs. This powerful, all inclusive, modeling and processing tool will simplify your workflow for movement analysis.**

Read to learn more about the features and benefits included in the latest version of Nexus. We've also included insights from Dr. Fabien LeBoeuf (Nantes Hospital, France and Research associate, University of Salford, UK) on the latest improvements to the Conventional Gait Model.

nexus

noun

1. a connection or series of connections linking two or more things. "the nexus between industry and political power"
2. a central or focal point



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WHO IS NEXUS FOR?



GAIT ANALYSIS & REHABILITATION



- Doctors & surgeons
- Military
- Physiotherapists
- Clinical scientists
- Postgrad research
- Undergrad teaching

ANIMAL SCIENCE



- Veterinary doctors
- Researchers
- Trainers
- Postgrad research
- Undergrad teaching

NEUROSCIENCE & MOTOR CONTROL



- Clinical scientists
- Doctors & surgeons
- Postgrad research
- Undergrad teaching
- Physiotherapists

SPORTS PERFORMANCE & BIOMECHANICS



- Performance analysts
- Commercial research
- Strength & conditioning
- Postgrad research
- Undergrad teaching
- Physiotherapists
- Coaches or trainers

Navigate and analyze your data faster to focus on your research, not the software.



CUSTOMIZABLE YET SIMPLE WORKFLOWS TO SAVE TIME

- Create a series of steps with the Biomechanics Workflow Builder to combine data collection and offline processing, making it simple to get started with the SCoRE and SARA Functional Calibration.
- Use offline Python/MATLAB capabilities.
- Review labeling quality and automatically detect and fill gaps.
- Manage your data via Vicon's database management tool, ProEclipse.



TRUSTED TO DELIVER CLINICALLY VALIDATED MODEL OUTPUTS

- Precise and repeatable data capture
- Camera calibration feedback helps to achieve consistent calibrations in the lab, to maintain data standards

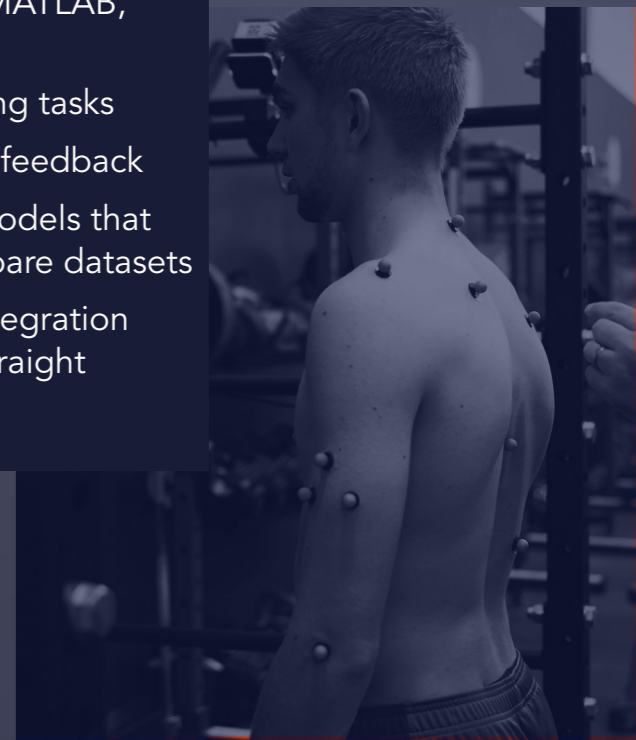


POWERFUL ANALYSIS AND DATA MODELING

- Process data using scripts created in Vicon BodyBuilder, Python, MATLAB, and Vicon ProCalc
- Automate common processing tasks
- Receive real-time calibration feedback
- Use native PiG and CGM2 models that can run concurrently to compare datasets
- Set up your Nexus Insight integration to analyze and report data straight from Nexus

90%

of our life sciences software enhancements are from customer feedback

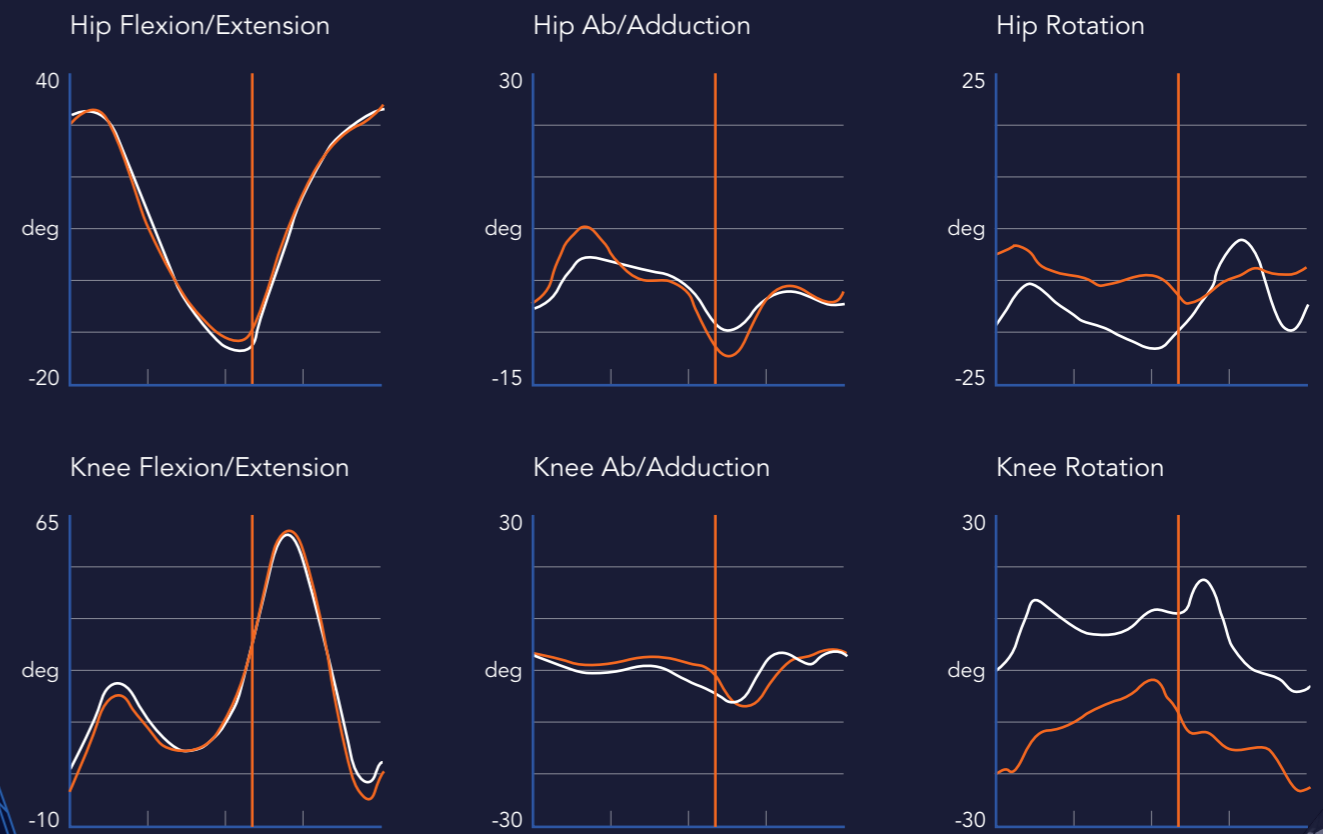


UPDATING THE CONVENTIONAL GAIT MODEL FOR THE MODERN WORLD

"The CGM2 project aims to address the limitations of the CGM while maintaining its strengths"

Dr. Fabien LeBoeuf

Plug-in Gait v CGM2 Kinematics (Left context only displayed)



PLUG-IN GAIT

CGM2

CGM VARIATIONS

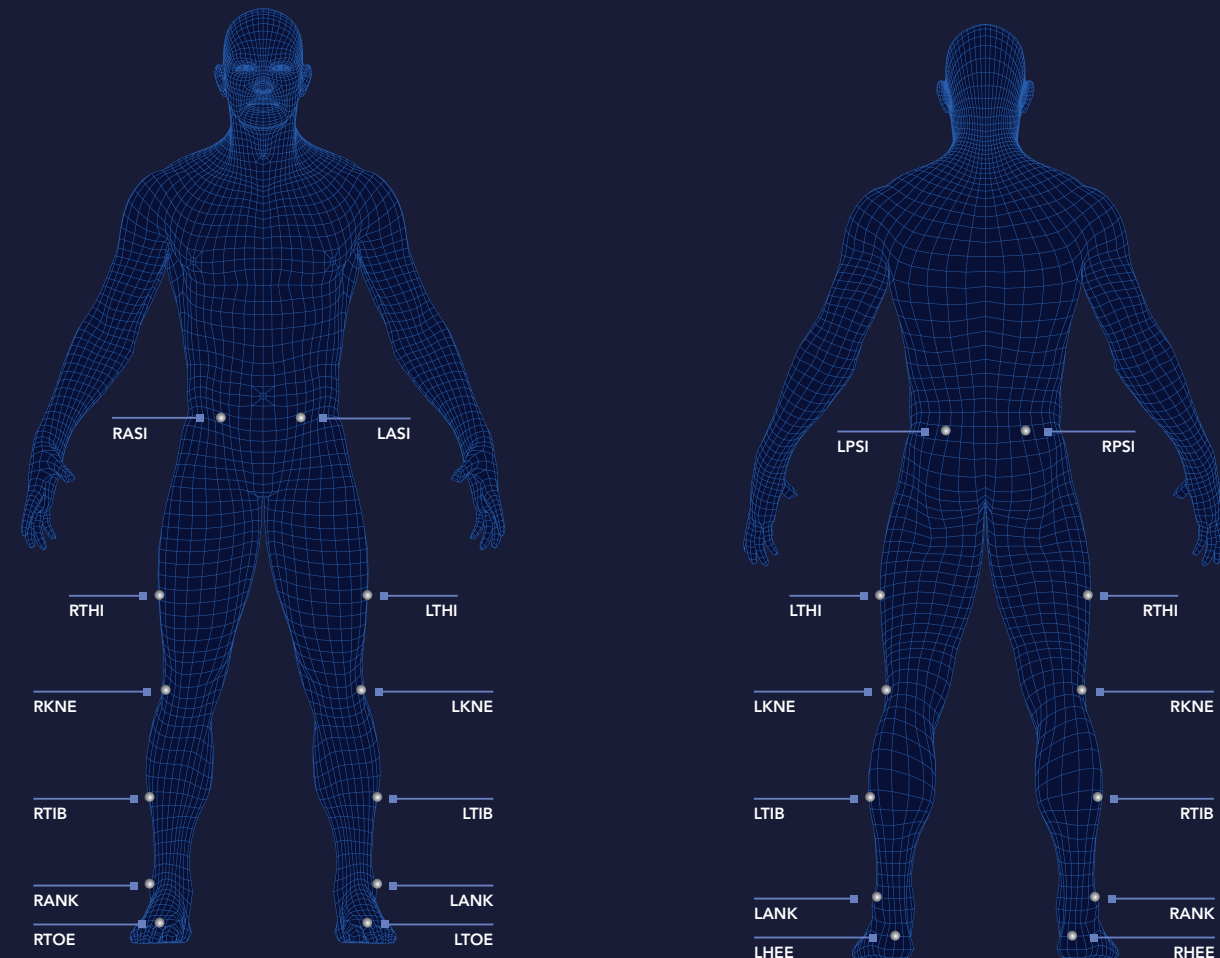
THE CONVENTIONAL GAIT MODEL 2 – CGM2 – IS AN OPEN SOURCE IMPLEMENTATION THAT REPRODUCES THE PAST, BUT PREPARES FOR THE FUTURE.

The CGM2 project updates the Conventional Gait Model for the modern world. Developed in a series of iterations, the project develops and validates an evolution of the CGM, which maintains its strengths and corrects its limitations.

Vicon has been privileged to work on this project with Dr Fabien LeBoeuf together with the staff at the Hugh Williamson Gait Analysis Laboratory at the Royal Children’s Hospital in Melbourne, who helped collect the data for the study.

The project’s findings have led to the creation of CGM2 – a combination of Vicon PiG and CGM features – to create a complete upper and lower body gait analysis model.

CGM 1.0 / 1.1



OPEN SOURCE FOR GREATER CONTROL

Dr. LeBoeuf’s research concentrated on extensive investigations on the localization of the hip joint center (HJC) in order to evaluate its impact on kinematics and kinetic CGM outputs.

Previously, no study had investigated the effect of HJC mislocation, because the CGM had been implemented in a proprietary commercial package that could not be modified.

CGM2 allows you to modify either the geometry of CGM or its kinematic and kinetic processing.

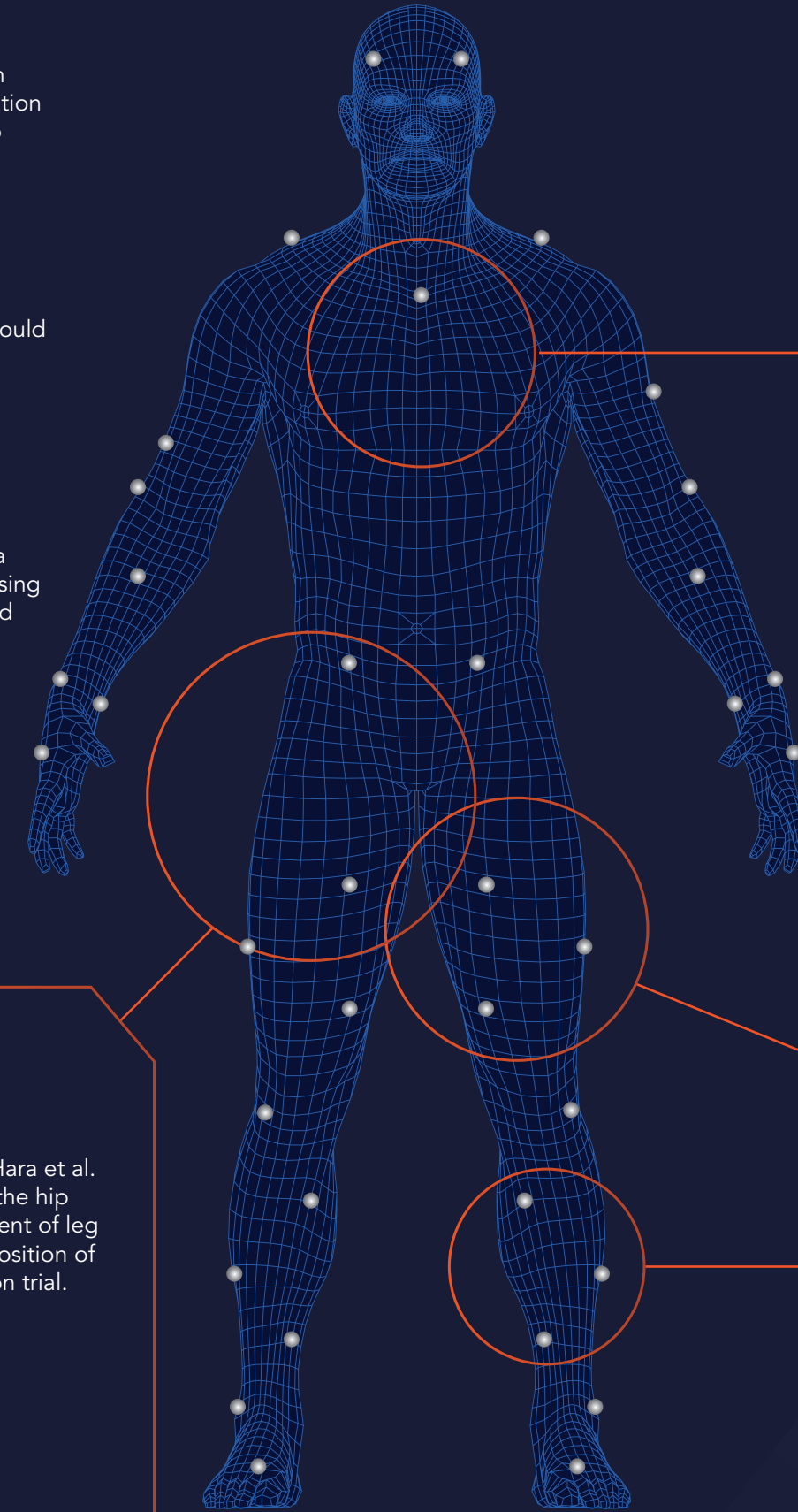
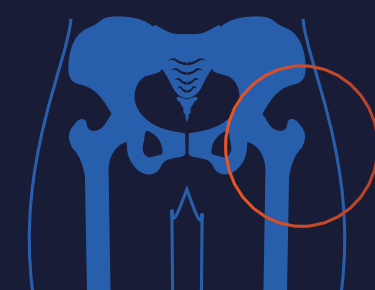
Nexus provides direct native pipeline integration to process your CGM2 data using scripts created in Python. Processing abilities extend to Python, MATLAB and Vicon ProCalc.

Nexus meets the modeling needs to enable the comprehensive integration of research pipelines and is equally suitable for quick in-class tuition.

It is the most robust, repeatable and reliable real-time labeling and skeletal solving solution available for biomechanics.

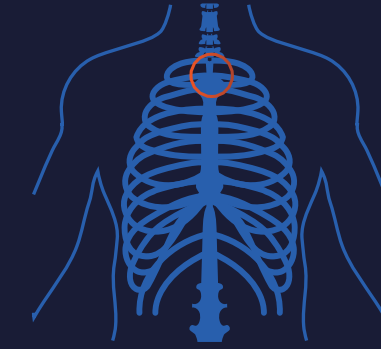
CGM 2.1 HIP JOINT CENTER ACCURACY

Uses the regression equations of Hara et al. (2016) to estimate the position of the hip joint center based on a measurement of leg length taken from the measured position of markers during the static calibration trial.



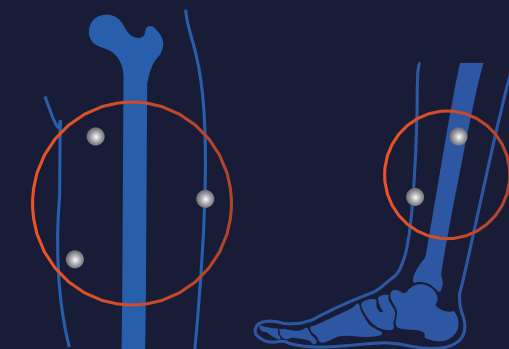
CGM 2.5 UPPER BODY MODEL

Marker sets for upper thorax model.



CGM 2.3 SKIN CLUSTERS

Removes thigh and tibia wand markers and replaces these with a small number of tracking markers (skin clusters) placed over the femur and shank segments.



BACK

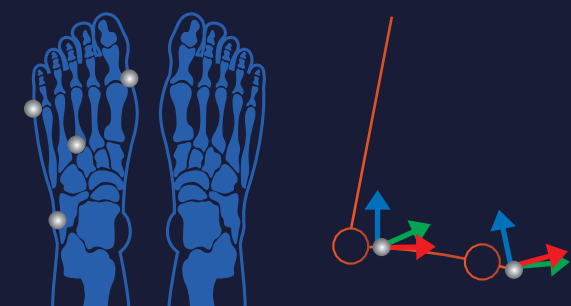
CGM 2.2 INVERSE KINEMATICS

Calibrates a rigid segment model to the data captured during a static trial and then uses inverse kinematics to track marker trajectories captured during the walking trial.



CGM 2.4 EXTENDED FOOT MODEL

Introduces a two-segment foot model, where the rear foot model is an adaptation of the CGM foot segment, and a new, additional forefoot segment is added.

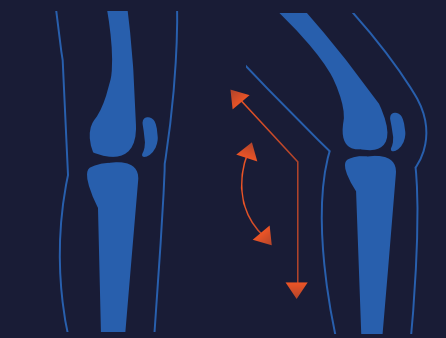


“The CGM2.1 project is an open source implementation that reproduces the past, but prepares for the future.”

Dr. Fabien Leboeuf

CGM 2.6 KNEE CALIBRATION

Incorporates functional calibration of the knee joint based on a dynamic functional calibration test conducted after static calibration but before fitting the model to walking trials.



WHAT MAKES NEXUS UNIQUE?

MANAGE & PREPARE YOUR SYSTEM

Easily calibrate and configure the system. Seamlessly connect mobile devices via the Vicon Control app. Prepare subjects by creating templates and calibrating pipelines, to allow **data capture away from your desk.**

The data-processing engine automatically initializes the labeling of your subject, removing the need to label manually. Nexus can **automatically detect gaps and display information about labeling quality**, enabling quick data correction if needed.

AUTOMATE PROCESSING OPERATIONS

Save time with highly customizable, automated processing operations. You can review your processing history and quickly pull off reports. **Create custom pipelines for common processing tasks.**

With direct native pipeline integration, you can process data using scripts created in Python, MATLAB and Vicon ProCalc.

CAPTURE & REVIEW MOVEMENT

Nexus enables you to capture movement, review trials, assess foot strikes and review data quality.

Perform modeling, using PiG, CGM2 the Oxford Foot Model, or your own model. Input subject measurements for PiG or full body analysis. **Incorporate external integrations such as EMG, force plates, and inertial sensors.**

Save time by creating custom and automated pipelines for data processing and analysis. Use scripts to provide further insights into your data created in Python, MATLAB, Vicon ProCalc and Vicon BodyBuilder. With direct integration, you can **review data directly into Vicon's newest reporting tool, Nexus Insight.**



INTEGRATION

Nexus can seamlessly integrate with Vicon's market-leading IMU, Blue Trident. It's wireless network device, Beacon, allows seamless synching across data types. By adding inertial sensors into the optical world, you can utilize and compare optical and inertial data in one platform.

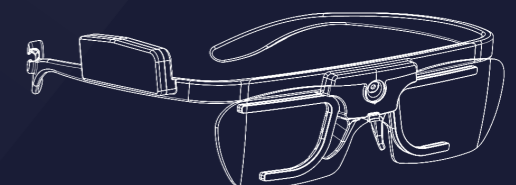
Global angles are available on the Blue Trident sensor. Using OpenSense integration, joint angles can be calculated.

OPEN SOUND CONTROL INTEGRATION

Open Sound Control is the protocol for communication among computer and sound synthesizers for networking technology. Nexus provides options for streaming data in OSC format, enabling live synchronized or offline. Data can be accessed by any platform that supports OSC for real-time control of sound and other media processing.

TOBII EYE TRACKER INTEGRATION

Tobii's latest eye tracker is integrated into Nexus, enabling streaming of synchronized eye-gaze tracking with optical data.

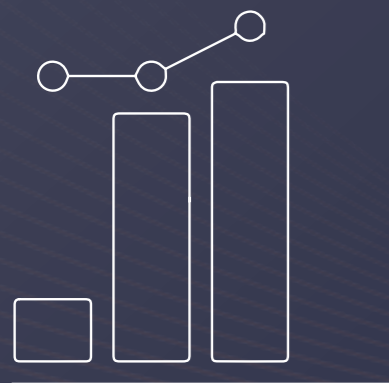
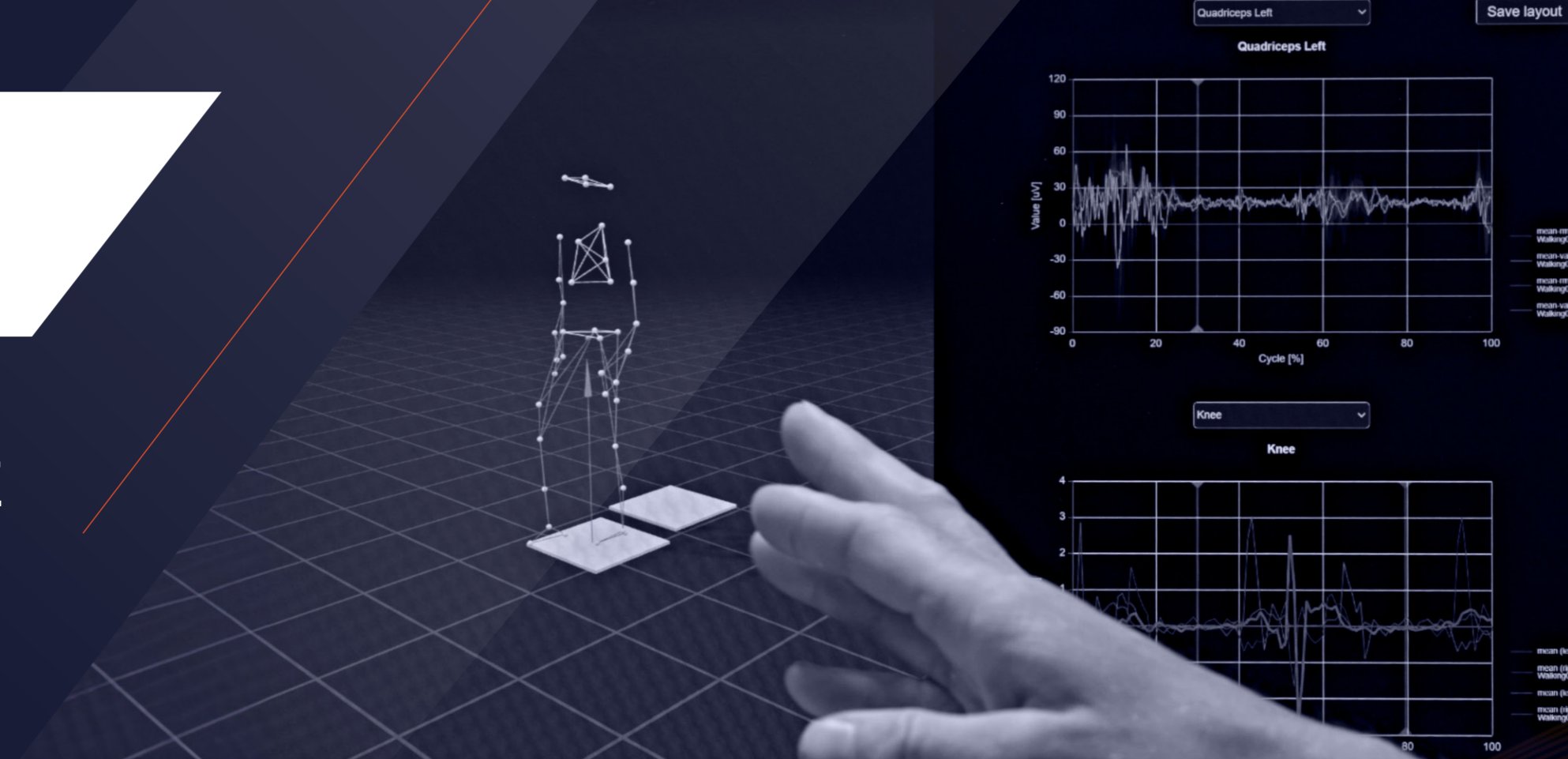


INTRODUCING NEXUS INSIGHT

EFFICIENT, INTUITIVE REPORTING

SIMPLIFY YOUR REPORTING

Adding a Nexus Insight integration to your workflow simplifies the reporting process with intuitive tools, clean presentation and highly customizable outputs.



Graph data imported directly from Nexus



Create custom-made reporting templates or use our existing examples



Switch to a customizable, quadrant-based layout with 3D, videos and chart components



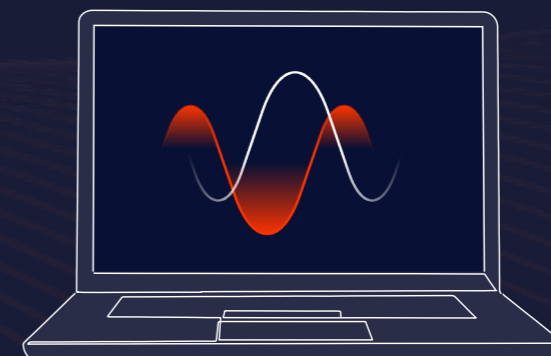
Import and compare reference data

CLARITY, ADAPTABILITY AND ACCESSIBILITY FOR BIOMECHANICS AND RESEARCH

Nexus Insight allows you to tailor your reports to demonstrate the information that you need. Whether you choose our automated tools or create your own templates, Nexus Insight makes it easier to interpret, share and compare data, even if it is across multiple subjects or over long periods of time.

Nexus Insight empowers biomechanical researchers and educators to take control of their data. Through a local installer, users can present their data without internet access for a secure and new accessible way to report.

Nexus Insight is a bespoke reporting tool for life sciences. It has been built within the community to simplify, save time, and make data comparison effortless, all within Vicon's leading motion capture ecosystem.



POWERED BY
MOVESHelf

Vicon has partnered with Moveshelf to develop Vicon's powerful new reporting tool, Nexus Insight. By combining the tried and tested technology that powers the Moveshelf Information System and Vicon's market-leading life sciences expertise and ecosystem, Nexus Insight brings you efficient, intuitive reporting.

VALKYRIE COMES TO NEXUS

SEE FARTHER AND FASTER

Nexus incorporates all variants of the Valkyrie camera, Vicon's best-in-class camera family for movement analysis.

CONFIDENCE IN HIGH-FIDELITY CAPTURE

Valkyrie pushes the boundaries of motion capture in the life sciences with unbeatable **range, speed and field of view**.

Valkyrie offers unprecedented levels of detail with pixel counts of up to **26MP**, capturing complex structures with extraordinary fidelity. Recording speeds up to **2000FPS** enable users to track incredibly fast-moving subjects such as athletes.

The camera's unique, custom-designed varifocal lens optimizes performance, no matter the application. Its wide, center and narrow field of view options can be combined within your setup to ensure the best possible coverage for your data capture. The combination of Valkyrie's IP65 rating and incredible range makes capturing subjects in their natural environments easier than ever.

FREE UP YOUR VALUABLE TIME

Valkyrie is engineered from the ground up to minimize its demands on your time. That means you can focus on what matters: your data and your subjects.

Even if you need to move your system for a project based out in the field, you can begin your session quickly. **Valkyrie's 30FPS full video preview mode makes camera aiming fast and accurate**, no matter the environment.

Once you're set up, the robustness of Valkyrie's tracking and calibration combines with clear display features to allow you to focus on your project.

After your trial, the high quality data combined with **Valkyrie's internal camera intelligence minimizes cleanup time and processing**. Partnered with Nexus's trusted ecosystem, your motion capture experience will be streamlined and efficient.



A CAMERA FOR ANY ENVIRONMENT

With Valkyrie, you can capture any movement in any environment, safe in the knowledge that your camera is IP65-rated.



A PRECISION-ENGINEERED LENS

Valkyrie includes a new, custom-built varifocal lens to increase range and precision.



INCREDIBLE SPEEDS

Valkyrie's native speeds go up to 500FPS, and as high as 2000FPS when using windowing techniques.



MARKET-LEADING RESOLUTION

With a resolution of 26MP Valkyrie offers unparalleled clarity.



INTUITIVE OPERATION

At 30FPS, Valkyrie's full video preview mode is Vicon's smoothest yet for easier camera monitoring.



For more information visit our website or contact us.

vicon.com/lifesciences

vicon.com/nexus

vicon.com/nexusinsight



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NEXUS SHORTCUTS

F1	Vicon Nexus help
F2	Data management
F4	Quick Reports window
F5	Full screen
F6	Sounds dialog box
F7	Options dialog box
F8	System Preparations Tools pane
F9	Subject Preparation Tools pane
F10	Capture tools pane
F11	Label/Edit Tools pane
F12	Pipeline Tools pane

NEXUS HOTKEYS

Ctrl+Enter	Start / stop capture
Ctrl+Tab	Switch live / offline mode
Ctrl+Space	Display/Hide marker labels
Ctrl+ ←	Move to previous event
Ctrl+ →	Move to next event
Ctrl+Z	Undo
Ctrl+Y	Redo
Ctrl+S	Save trial
Space	Pause / restart real-time data streaming
Space	Play / stop offline data
Esc	Exit current mode (labeling, etc.)

MOUSE ACTIONS

Right-click and drag	Zoom 3D space
Left-click and drag	Rotate 3D space
Left and right-click and drag	Move 3D space
Left-click	Select individual item
Ctrl + click	Select several items
Alt + click and drag	Select individual item