THE MOST TRUSTED MOTION CAPTURE ECOSYSTEM, INSPIRED BY YOU

Nexus is the most powerful all-inclusive modeling and processing tool for movement analysis on the market. Created specifically for the whole life sciences community, Nexus delivers precise, repeatable and clinically validated data.

With more than 90% of our product enhancements driven by customer feedback, Nexus 2 is the latest version of our most trusted motion capture software.

Learn more about the new features and benefits of Nexus 2, together with some insights from Dr. Fabien LeBoeuf (Nantes Hospital, France and Research associate, University of Salford, UK) on the latest developments in Conventional Gait Modeling.

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.
WHO IS NEXUS FOR?

**GAIT ANALYSIS & REHABILITATION**
- Doctors & surgeons
- Clinical scientists
- Postgrad research
- Undergrad teaching
- Physiotherapists

**NEUROSCIENCE & MOTOR CONTROL**
- Clinical scientists
- Doctors & surgeons
- Postgrad research
- Undergrad teaching
- Physiotherapists

**ANIMAL SCIENCE**
- Veterinary doctors
- Researchers
- Trainers
- Postgrad research
- Undergrad teaching

**SPORTS PERFORMANCE & BIOMECHANICS**
- Performance analysts
- Commercial research
- Strength & conditioning
- Postgrad research
- Undergrad teaching
- Physiotherapists
- Coaches or trainers
Often when a system becomes so advanced, it can be difficult and time-consuming to use. Nexus may be Vicon’s most advanced data capture software, but that doesn’t mean it is complicated to use.

- Customize your workflow to save time by automating common processing tasks.
- 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.

Poor quality, inconsistent data can have a severe impact on decision-making. You need precise and repeatable results from high-quality, clinically validated data.

- Four times more research papers on CGM than any other model*
- Precise and repeatable data capture
- Camera calibration feedback helps to achieve consistent calibrations in the lab, to maintain data standards.

Capturing the data is just the first step. Modeling is where the real analysis can begin. Modeling should be intelligent and advanced, designed specifically for life sciences.

- Powerful native and compatible modeling, you can process data using scripts created in Vicon BodyBuilder, Python, MATLAB, and Vicon ProCalc.
- Automated labeling
- Real-time calibration feedback
- Native PiG and CGM2 – can run concurrently to compare datasets

Nexus sets a standard for motion capture. With a host of new automated features, intelligent processing, flexible controls, and Vicon IMU integration; Nexus enables you to focus on the research, not the software.

*Google Scholar, Feb 2019
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)
Dr. LeBoeuf’s research concentrated on extensive investigations on the localization of the hip joint center 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 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, 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.

The CGM2 project replicates the Conventional Gait Model for the modern world. Developed in a series of iterations, the project strengthens and extends an open-source implementation of CGM in its strengths and connects to its heritage.

The CGM2 project updates the Conventional Gait Model for the modern world. Dr. LeBoeuf’s research concentrated on extensive investigations on the localization of the hip joint center in order to evaluate its impact on kinematics and kinetic CGM outputs.

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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.

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.

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 project updates the Conventional Gait Model for the modern world. The project updates the Conventional Gait Model for the modern world.
WHAT CAN YOU DO WITH NEXUS?

MANAGE & PREPARE YOUR SYSTEM

Easily calibrate and configure the system. Seamlessly connect mobile devices via the Vicon Control app. Prepare subjects by creating subject templates, calibrating labeling skeleton templates, creating pipelines, to increase the speed and accuracy of processing data.

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.

Nexus enables you to capture muscle activity and movement, review trials, assess foot strikes and review data quality. The system identifies events and fills gaps in your data.

Perform modeling, using PiG or CGM2 to derive kinematics and kinetics, or Oxford Foot Model for kinematics. Input subject measurements for PiG or full body analysis. Incorporate EMG and force plates into your session easily. Working with inertial sensors, you can capture, manage, import and export IMU data. Process digital video files and export trial data with 3D video overlay, ASCII or C3D.

CAPTURE & REVIEW MOVEMENT

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 Vicon BodyBuilder, Python, MATLAB and Vicon ProCalc.
**Nexus 2.10 Onwards Seamless Integration**

Nexus 2.10 can seamlessly integrate with Vicon’s market-leading IMU, Blue Trident, via its wireless network device, Beacon. By adding inertial sensors into the optical world, you can collect synchronized optical and inertial data in one platform.

**Hard Sync**

Precise timing of inertial to optical data.

**Quaternions**

When combining Blue Trident with Nexus you can describe global joint angles with three-dimensional orientation and rotation.

**Tobii Eye Tracker Integration**

Tobii’s latest eye tracker is integrated into Nexus 2.10, enabling streaming of synchronized eye-gaze tracking with optical data.

**Open Sound Control Integration**

Open Sound Control is the protocol for communication among computer and sound synthesizers for networking technology. Nexus now 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.
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. Capture speeds of 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.

LEGENDARY PERFORMANCE

Nexus 2.15 incorporates Valkyrie, the world’s most powerful motion capture camera, into Vicon’s best-in-class life sciences ecosystem.

MARKET-LEADING RESOLUTION

With a resolution of 26MP Valkyrie offers unparalleled clarity.

INCREDIBLE SPEEDS

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

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INTUITIVE OPERATION

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

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.
For more information visit our website or contact us.
www.vicon.com/lifesciences
www.vicon.com/nexus

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
Ctrl+R Reset core processor
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