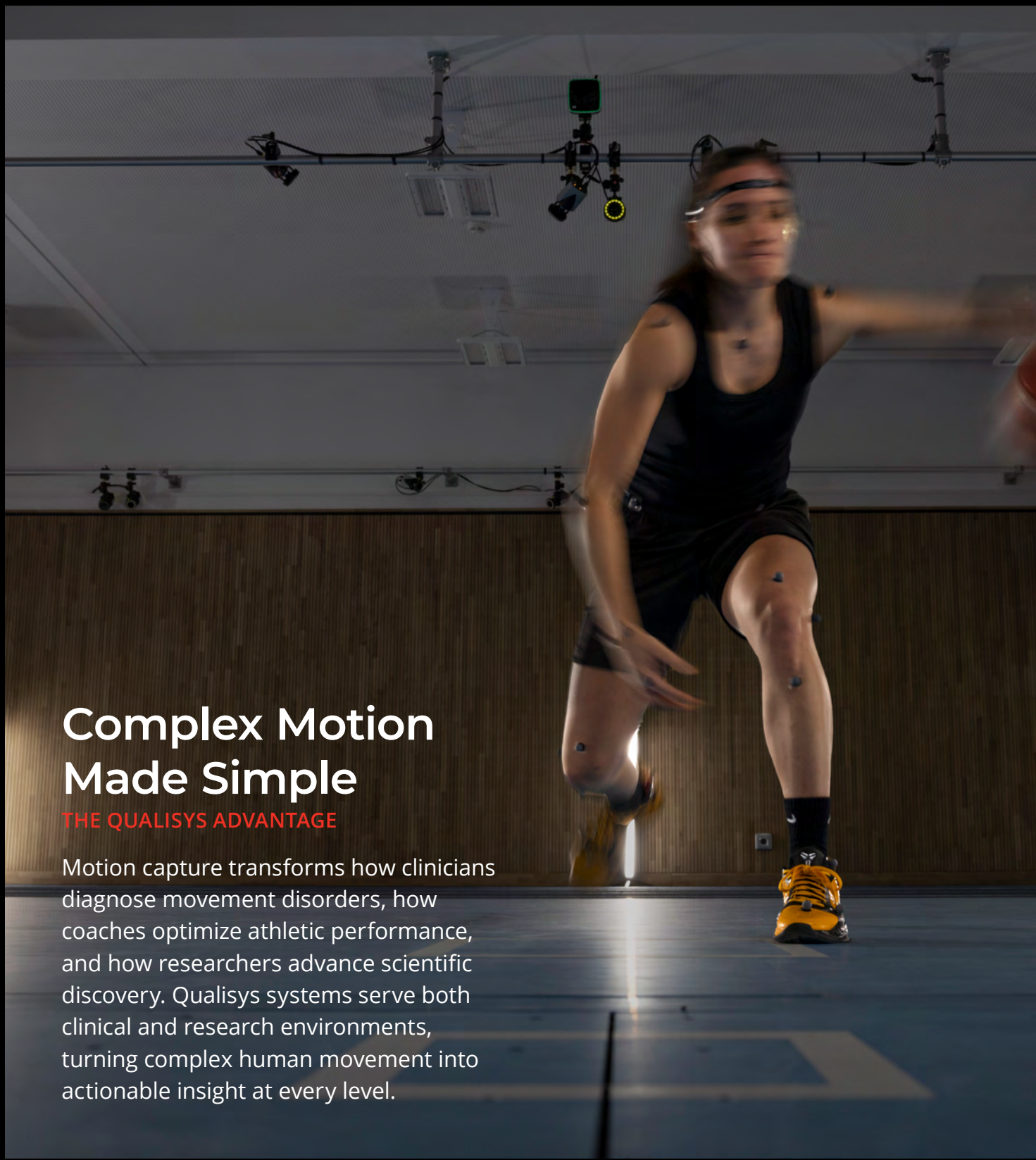
Motion Capture for Life Sciences





Complex Motion Made Simple

THE QUALISYS ADVANTAGE

Motion capture transforms how clinicians diagnose movement disorders, how coaches optimize athletic performance, and how researchers advance scientific discovery. Qualisys systems serve both clinical and research environments, turning complex human movement into actionable insight at every level.

QUALISYS

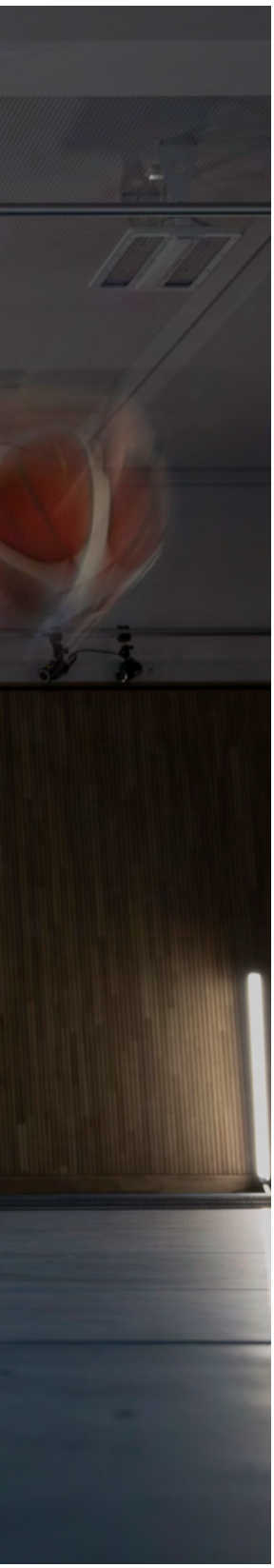


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01

Biomechanics Research

Understanding movement across species advances biomechanics science. Researchers studying human or animal biomechanics need precision without proprietary constraints. Qualisys provides accurate motion capture, flexible data control, equipment integration, and raw data export so scientific questions drive research, not software limitations.







QUALISYS





Human Biomechanics

Research labs face constant pressure: legacy systems don't integrate, analysis tools consume more time than actual research, and equipment budgets force compromises.

From kinesiology to orthopedics, gait analysis to ergonomics, Qualisys solutions provide continuity with your past work, automation tool that save hours, and and flexible systems that inspire unique research.

"We appreciate that Qualisys deals with research-specific demands by optimizing data processing and implementing communication protocols that minimize latency during data streaming."

Peter Wolf
Senior Researcher, Sensory-Motor Systems Lab
Read story

QUALISYS

ACCESS FOR YOUR ENTIRE LAB

Sitewide and student licenses give your whole department access to professional-grade tools. Train the next generation of researchers with the same systems they'll use in their careers.

ADAPTIVE TECHNOLOGY FOR UNIQUE RESEARCH NEEDS

Qualisys systems work outdoors, underwater, across multiple synchronized volumes, and integrate marker-based with markerless capture. Our technology adapts to your research needs, not the other way around.

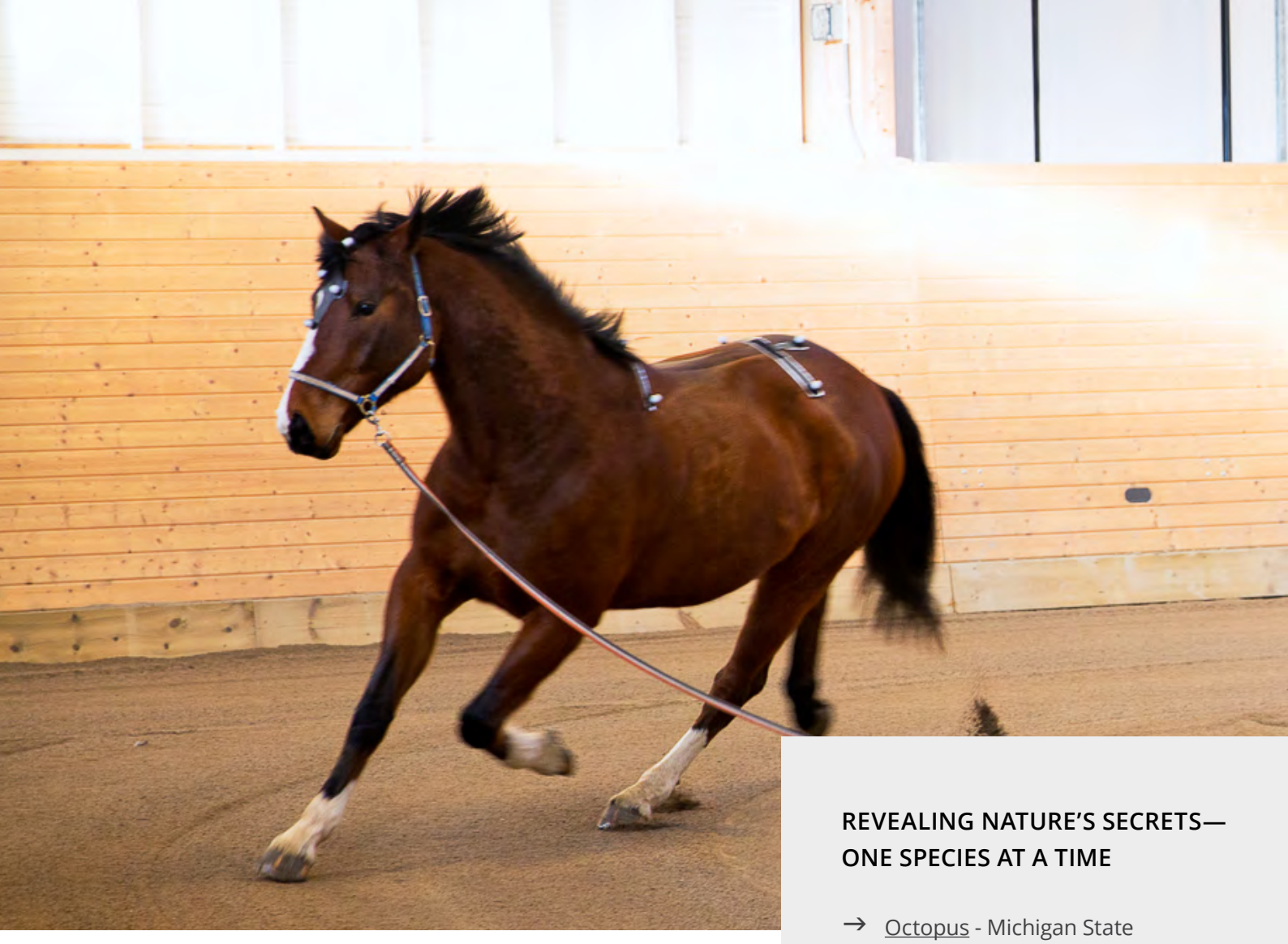
SOFTWARE TOOLS THAT BOOST PRODUCTIVITY

Custom PAF and scripting workflows automate repetitive tasks so you can focus on analysis, not data cleanup. Trajectory identification and editing tools handle occlusions fast, so you meet deadlines without compromising data quality.

BUILD UPON PAST RESEARCH WITH LEGACY DATA COMPATIBILITY

In academia, continuity is essential. Legacy data compatibility allows you to build on existing work and protect your research continuity. Your past data belongs with your future discoveries.





Animal Biomechanics

Precision matters when lives depend on it. Whether advancing elite veterinary research or improving daily clinical outcomes, Qualisys technology offers an accurate, non-invasive way to analyze the biomechanics of animals, from beloved pets to elite working dogs and champion horses.

Qualisys high resolution cameras and calibration options ensure accurate results in large volumes, even outdoors, with protected cameras, sun filters, and active filtering. Capturing a horse's distal limb needs higher frame rates, easily handled by Arqus cameras with frequencies up to 1440Hz.

REVEALING NATURE'S SECRETS— ONE SPECIES AT A TIME

- → Octopus - Michigan State University
- → Mice - Okinawa Institute of Science and Technology
- → Grasshoppers - Union College
- → Birds - RMIT University
- → Elephants - University of Geneva
- → Chickens - University of Bristol
- → Snakes - Virginia Tech University
- → Locusts - University of Konstanz

...and many more!

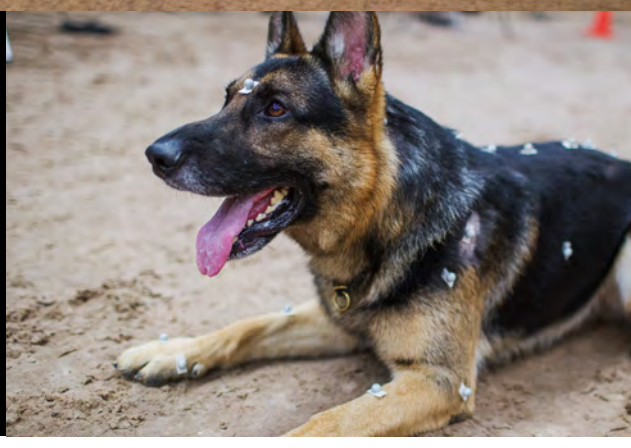
QUALISYS

CASE STUDY

Canine locomotion analysis

Many dog-owners have probably asked themselves: is that a limp? Is my dog in pain? The SLU Movement Laboratory uses Qualisys technology to better understand canine movement.

Read story





02

Neuroscience

Neurology research demands precision movement capture under challenging conditions. MRI scans, VR environments, and coordinated device arrays make motion capture challenging. Qualisys is built for these constraints, so researchers can study motor behavior where it matters - in the brain scanner, in immersive environments, with real-time synchronized data.

From recording tiny hand motions during functional MRI scans to tracking full-body kinematics in virtual environments, Qualisys' adaptive systems provide researchers with actionable data that transforms diagnosis, therapy, and treatment planning.

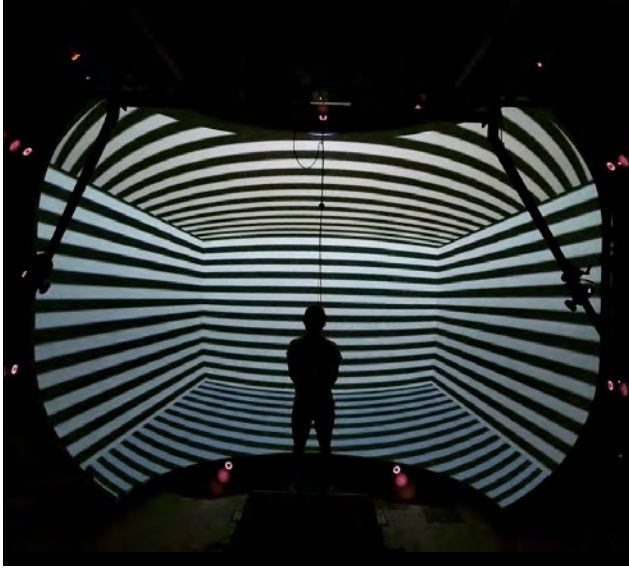
> "The Qualisys MRI motion capture system allows us to examine the neuroscience of the human motor system under naturalistic conditions in a more quantitative way than ever before."
>
> **Trenton Jerde**
> *Postdoc researcher, NYU Curtis Lab.*
> Read story

QUALISYS

NEUROLOGICAL AND BIOMECHANICAL FUSION

The University of Delaware CoBal Lab uses a Virtual Reality Dome to manipulate a subject's senses as human motion is investigated.

Read story



THE ONLY MRI MOCAP CAMERA

Qualisys' fully shielded Arqus MRI cameras deliver precise data capture inside MRI setups with no electromagnetic interference.

VIRTUAL REALITY ADAPTABILITY

Compatible with Virtual Cave environments, Qualisys enables immersive research with precise tracking for VR applications.

MULTI-MODAL SYNCHRONIZATION

Synchronize data with EMG, EEG, TMS, force plates, eye tracking devices, and other neuroimaging modalities.

03

Clinical & Rehabilitation

Clinics and rehabilitation centers need systems that work reliably every time. Qualisys delivers validated protocols, practical workflows, and clear reports that support better decisions in diagnosis, treatment, and performance optimization.







QUALISYS





Gait Analysis

Qualisys provides advanced motion capture solutions designed to meet the demands of both clinical and research-based gait analysis, offering accuracy, integration, and ease of use for professionals worldwide.

Gait analysis often encounters significant challenges, including complex data management, strict precision and compliance requirements, and outdated, fragmented systems. These issues can disrupt workflows and delay results.

Qualisys solutions for gait analysis address these hurdles, helping professionals simplify their work, reduce errors, and uncover crucial insights with confidence, enabling higher productivity and better patient outcomes.

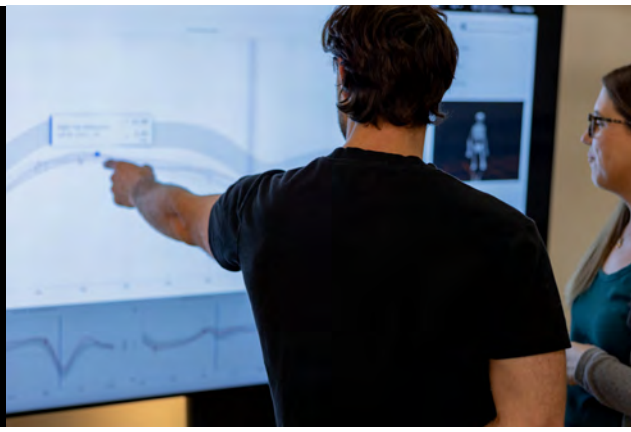
GAIT OR CLINICAL GAIT WHICH MODULE SHOULD I CHOOSE?

- → The Qualisys Clinical System (QCS) Module is ideal for diagnosis, treatment assessments, and patient monitoring.
- → The Gait Analysis Module is better suited for research purposes.

ANALYSIS MODULES
For easy reporting and patient focus

Qualisys gait analysis modules include a wide range of marker sets, event modes, hardware devices, capture modes, and detailed guides to help you get started quickly.

Read more



QUALISYS

STREAMLINED FOR CLINICAL EFFICIENCY.
Centralized interface for data management, capture, and reporting.

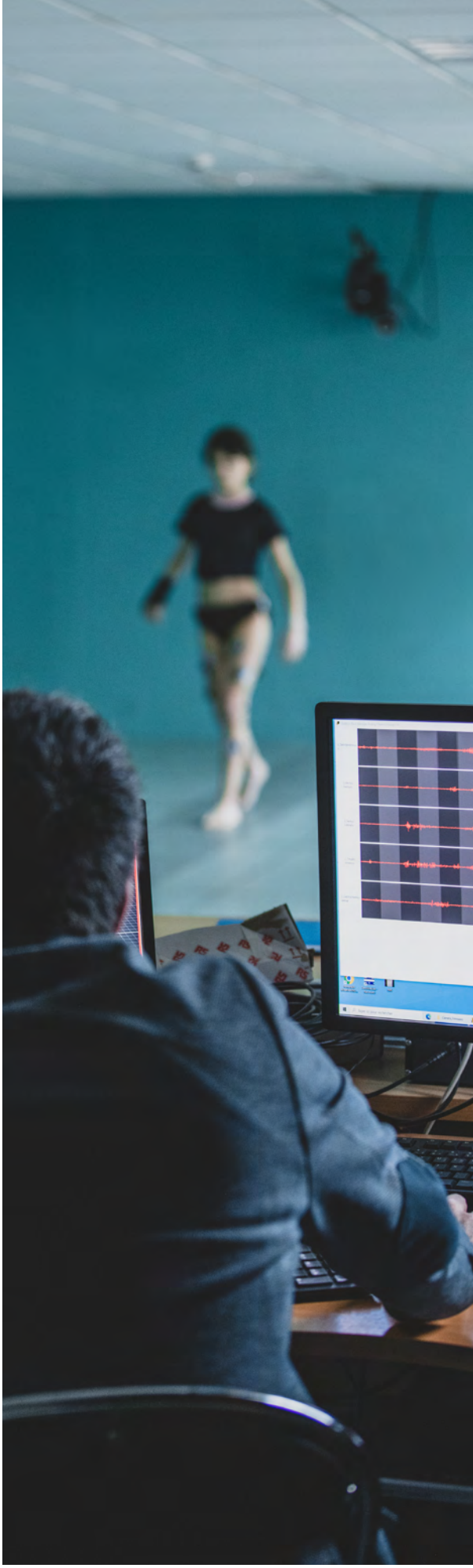
CLINICAL COMPLIANCE YOU CAN TRUST
FDA-cleared Class 1m Medical Device ensures safe and reliable use.

COMFORT + PRECISION, MARKERS OPTIONAL
Support for multiple marker sets or markerless capture for flexibility in testing methods.

ONE SYSTEM, NOT MULTIPLE TOOLS
Use QTM as the sole data acquisition software for motion data, video, force plates, and EMG.

NO MORE MANUAL DATA ENTRY
Pre-defined file naming and processing eliminate manual errors and streamline workflows.

REPORTS CLINICIANS CAN ACT ON
Interactive formats, patient feedback, and secure export options for professional output.





Movement Assessment

Physical Therapists and practitioners have historically relied on subjective observation or fragmented tools that don't talk to each other. Clinicians and coaches struggle to compare results across sessions or justify treatment decisions. Qualisys delivers objective, consistent data so movement assessment becomes science, not guesswork.

By integrating both marker-based and markerless systems with comprehensive reporting tools, Qualisys enables users to analyze movement with exceptional accuracy to support training, recovery, and performance optimization.

"We do believe that motion capture can help to identify the origins of movement related problems. Our work serves medical doctors and physical therapists to help patients overcome their injury related restrictions as fast as possible."

Steffen Willwacher, PhD
Sport Scientist, IFD Cologne

Read story

CALQULUS
CLOUD BIOMECHANICS

Calqulus is Qualisys' cloud-based processing engine for biomechanical analysis, eliminating the need for additional software, saving time and money while ensuring secure, reliable processing. The Calqulus Reports package includes Baseball, Cricket, Cycling, Functional Assessment, Running, and a generic pipeline.

Read story

QUALISYS



NO MARKERS, NO PREP, NO DELAYS

Choose between marker-based precision or use Miqus Video Plus and Miqus Hybrid cameras for markerless tracking and biomechanical analysis.

READY-TO-USE PROTOCOLS

Functional movement tasks are easily analyzed with pre-configured test protocols, making assessments accurate and efficient.

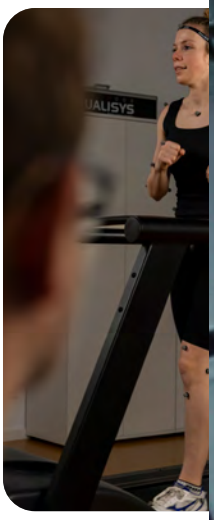
A UNIFIED MOVEMENT ASSESSMENT

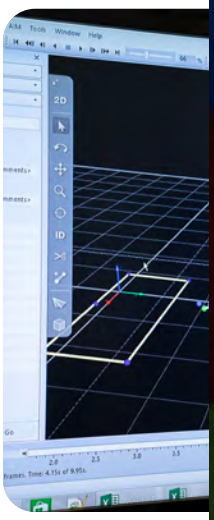
Integration with external systems like force plates and EMG allows for synchronized data collection, providing deeper insights into movement patterns.

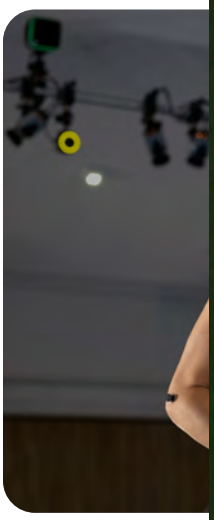
04

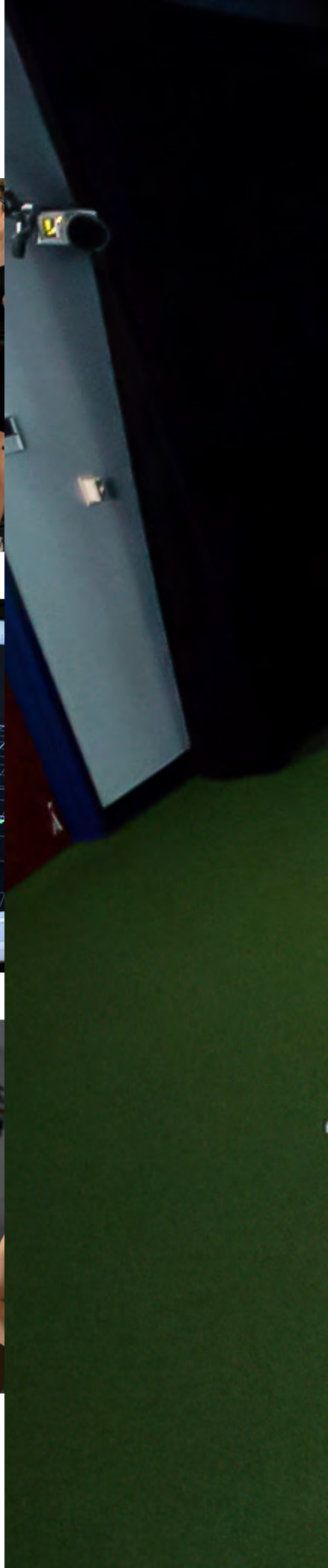
Sports

Athletes demand real-time feedback to improve performance and gain competitive advantage. Coaches need objective data to justify training decisions and prevent injuries. Researchers need precision to advance sports science. Qualisys delivers all three, from instant on-field insights to lab-grade accuracy.









QUALISYS





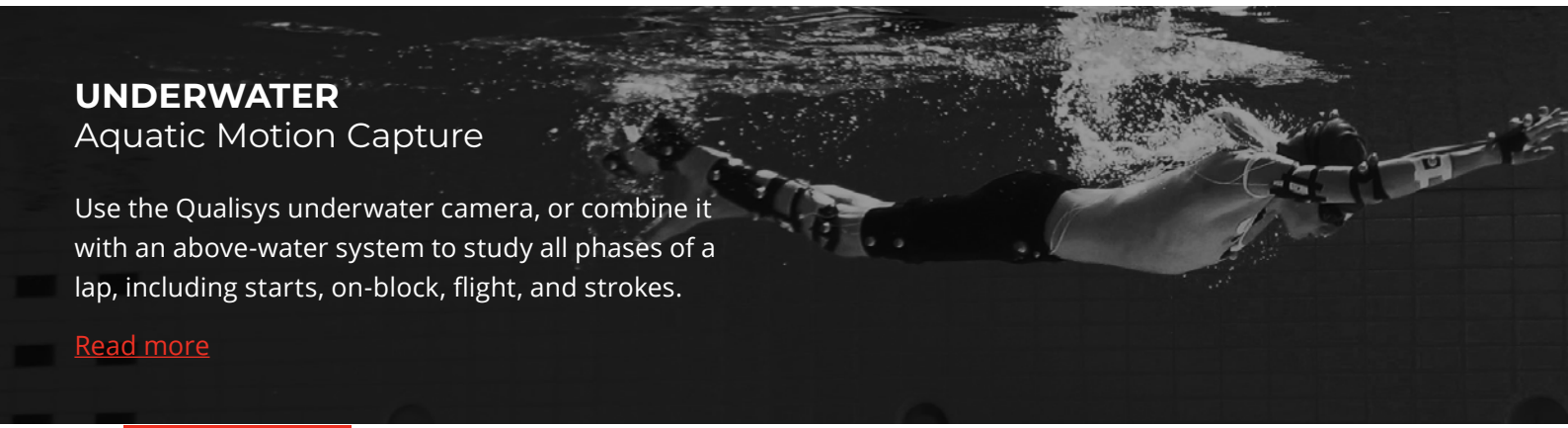
Sports Research

Qualisys motion capture technology elevates sports research by unlocking deeper insights into performance, safety, and health. With decades of innovation, Qualisys provides industry-leading solutions designed to optimize athletic performance, prevent injuries, and drive advancements in equipment design.

"There are several dozen specific metrics we track, and each one can highlight potential issues that we can address – this is about as sophisticated an analysis as you can get!"

Bahram Shirazi
Owner, Rockland Peak Performance

Read story



UNDERWATER
Aquatic Motion Capture

Use the Qualisys underwater camera, or combine it with an above-water system to study all phases of a lap, including starts, on-block, flight, and strokes.

Read more

QUALISYS

VIDEO + 3D DATA TOGETHER

Experience 3D data overlaid on crystal clear 2D video. Miqus Video Plus provides full resolution of 2.8MP streaming synchronized video at speeds up to 480 fps for precise sports analysis.

FULL INTERACTIVE ANALYSIS IN MINUTES

Leverage Qualisys Analysis Modules and Project Automation Framework (PAF) to create custom protocols, personalize your workflows, and export data for further analysis.

SIMULTANEOUS MARKELESS AND MARKER-BASED CAPTURE

Track prosthetics and athletic equipment using marker-based cameras while simultaneously capturing human biomechanics through video-based markerless tracking - a *true* hybrid capture!

EXPERTS IN OUTDOOR MOTION CAPTURE SINCE 2005

With nearly two decades of expertise, our systems deliver unmatched accuracy and adaptability outdoors for sport-realistic research environments.





Sport Performance

Qualisys technology offers advanced biomechanics and motion analysis across a wide range of sports, By integrating Qualisys solutions into training routines, athletes receive precise performance evaluations, while coaches gain actionable data to improve decision-making.

Traditional performance analysis tools often fall short in capturing complex movements like a pitcher's throw or golfer's swing, lacking the precision, frame rate, and in-depth reporting needed to offer actionable insights.

With high frame rates, precise 3D data, and interactive web-based reports, Qualisys provides an end-to-end solution for analyzing athletic movements, helping professionals address performance gaps and elevate athletic potential across all levels of competition.

"Having done numerous measurements with Qualisys, outdoors and indoors, I am fascinated by the resolution of the cameras. Tracking worked immediately, delivering results to the players shortly after the recordings. This offers incredible opportunities for athlete feedback which is of high importance on all levels."

Uwe G. Kersting
Professor, Aalborg University
Badminton BEC Centre of Excellence

Read story





TAKE FULL CONTROL WITH FLEXIBLE, SCALABLE SOLUTIONS

Coaches work in different environments with different equipment. Rather than forcing one approach, Qualisys adapts. Markers, markerless, or both simultaneously. Indoors or outdoors, rain or shine. One system that grows with your program instead of limiting it.

BUILT FOR SCIENCE, DESIGNED FOR SIMPLICITY

With a daisy chain setup for simple connections, a site license for hassle-free access, and quick calibration, Qualisys systems are up and running in no time. Automatic Identification of Markers and robust trajectory editing tools streamline workflows and save time.

PLUG-AND-PLAY REPORTING SOLUTIONS

Qualisys Analysis Modules make it easy to create insightful, interactive reports with charts, video, and a 3D viewer. Customize report layouts for specific analytical needs and use the Report Center to store, edit, and share. Available for golf, baseball, cycling, cricket, functional assessment, and running.
Read more

05

Specialty

Outdoor/Weatherproof

Arqus Protected

Capture with confidence in any outdoor environment. For over 20 years, Qualisys has delivered precise motion capture, even in rain, dust, or bright sunlight. Arqus Protected Cameras feature IP67 protection, Sun Filter tech, and ultra-bright strobes.

Read more



A5P	A9P	A12P	A26P
5 MP / 700-1400fps	9 MP / 300-590fps	12 MP / 300-1040fps	26 MP / 150-290fps

Underwater

Capture movement where others can't. Qualisys offers optical underwater motion capture cameras, 3D tracking up to 30m, and real-time data for biomechanics, rehabilitation, and aquatic performance research.

Read more



M3UW	M5UW	A9UW	A12UW
2MP / 340fps	4MP / 180fps	9MP / 300fps	12MP / 300fps

Cameras

FOR LIFE SCIENCES APPLICATIONS



Markerless

Miqus Video & Miqus Hybrid

Miqus Hybrid switches between markerless and marker-based tracking in one click, while Miqus Video Plus offers high-speed video with 3D overlay and works as a full markerless system. Combine Miqus Video with marker-based cameras for True Hybrid simultaneous capture.

Read more

MV+	Hybrid	Hybrid
2.8MP 120 - 540fps	VIDEO MODE 2MP / 85-330 fps	MARKER MODE 2MP / 340fps



Arqus MRI

Qualisys Arqus MRI is the only camera system capable of capturing high-resolution 6DOF motion inside an MR environment. Fully shielded, real-time, and purpose-built for life sciences, such as neurology and orthopedics.

Read more

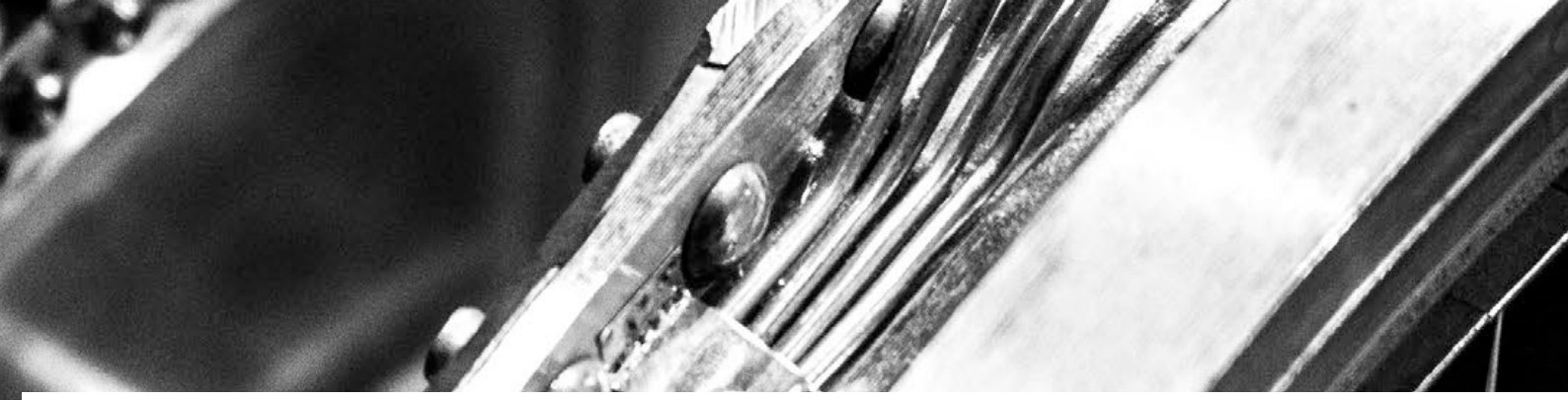
Arqus MRI	Standard Mocap Cameras
9 MP / 300-590fps	*Visit our website to learn about our standard motion capture cameras.*

06

Integrations

Qualisys offers digital integration with external devices and software, ensuring synchronized, high-fidelity data across systems. Whether streaming live or exporting data, adaptive QTM integrations support advanced modeling, analysis, and visualization, driving deeper insights in life science research.





Device Integrations

FORCE PLATES
Measure ground reaction forces to add inverse dynamics and calculate joint kinetics for your biomechanics analysis.

INSTRUMENTED TREADMILLS
For dynamic motion analysis, particularly in gait and running research.

EMG
Allows for the simultaneous capture of muscle activity and motion data, as insights into neuromuscular coordination.

IMU
Provides complementary data on linear and angular motion using accelerometers, gyroscopes, and sometimes magnetometers.

EYE TRACKING DEVICES
Combines eye tracking with optical mocap for synchronized gaze and motion data.

HAND TRACKING DEVICES
Integrates gloves and hand tracking devices with optical mocap for precise finger tracking without the need for markers.

BERTEC · AMTI FORCE AND MOTION · TREADMETRIX · h/p/cosmos® · DELSYS · NORAXON MOVEMENT • DATA • PEOPLE

KISTLER · cometa · tobii · KUNWEI Sport Technology · Arsalis · MANUS™

Software Integrations

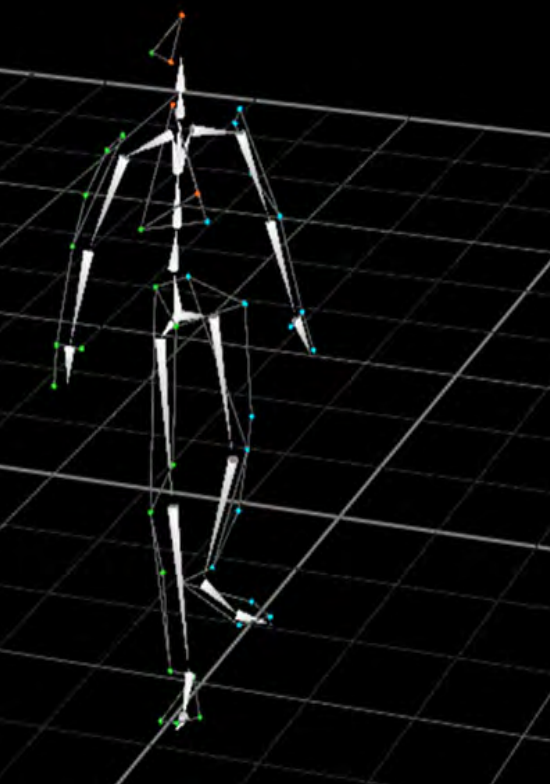
HAS Motion · theia · ANYBODY TECHNOLOGY · OpenSim · moveck intelligence in motion



07

Our Software

Qualisys Track Manager



CRAZY FAST CALIBRATION

QTM completes calibration in under one minute. Then visualize your calibrated volume and camera view cones to identify blind spots before capturing.

STREAM LIVE, EXPORT LATER

Stream motion data over TCP or UDP for integration with other applications. Export to C3D, FBX, TSV, TRC, STO, MATLAB, and more for custom analysis workflows.

REAL-TIME FEEDBACK

See motion capture plus all integrated device data in real-time. Use data windows, plots, and video overlay to test quality and give immediate feedback.

STOP MANUALLY LABELING

Automatic Identification of Markers (AIM) gets smarter as you use it. Combined with Skeleton Assisted Labelling, QTM eliminates manual trajectory identification.

USE PROVEN PROTOCOLS

QTM comes with pre-built modules for a variety of sports and movement tasks. Get automated analysis and standardized reports, no custom coding needed.

DON'T DISCARD DATA, FIX IT!

QTM's Trajectory Editor fills gaps using various methods, saving time and keeping valid data intact. View the state of all trajectories in the trajectory overview window.

PROCESS IN BATCHES

Batch processing captures and analyzes multiple sessions without manual intervention. Set up your protocol once, then let QTM automate the rest.

QTM SCRIPTING INTERFACE

Build proprietary calculation modules, automate unique pipelines, and control QTM programmatically without constraints with scripting in QTM.

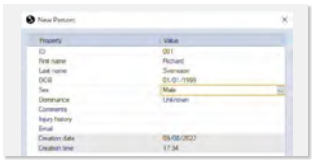


Analysis Modules

An analysis module is an automated framework that runs a specific protocol within QTM, from participant setup through data collection to report. Most modules support marker-based and markerless capture. Reports can include motion, EMG and force plate data.

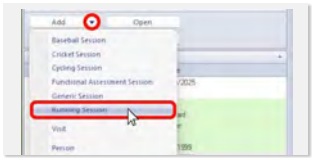
ADD THE PERSON

Enter a person or patient once in the project data tree, with ID, name, date of birth and injury history.



ADD A SESSION

Add a session for each visit and choose the test. The person's details carry over into the session and the report.



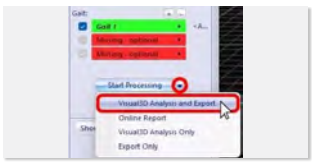
RECORD THE TRIALS

Sessions include static and dynamic trials. Red and green trial indicators make it easy to follow your progress.



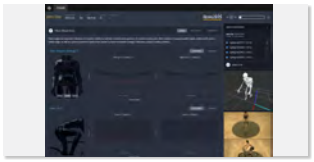
PROCESS DATA

One button runs the analysis in Calqulus or Visual3D. Markerless data first solves with Prisma Pose or opens Theia3D.



REVIEW THE REPORT

The result is an interacive web report, Visual3D report, or both. The web report shows charts, video and a 3D viewer.



FUNCTIONAL ASSESSMENT

18+ tasks to choose from

GOLF

Driver, iron, and putting sessions

GAIT

Research and clinical use (QCS)

BASEBALL & SOFTBALL

Baseball and softball sessions

CYCLING

Bike markers for bike fitting

RUNNING

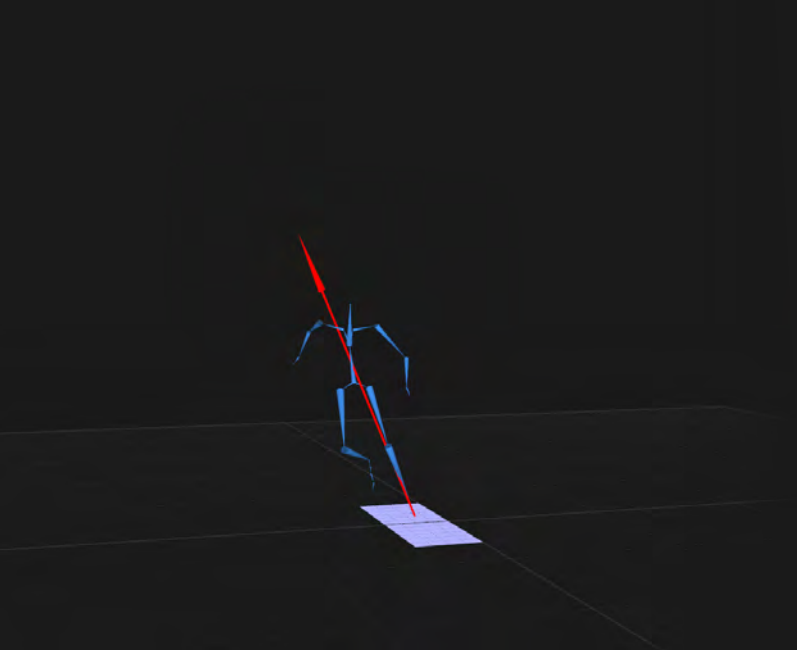
Overground or on a treadmill

CALQULUS

Calqulus is our online processing engine that runs biomechanical calculations in the cloud with no extra software to install.

Calqulus reports include Baseball, Cricket, Cycling, Running, Functional Assessment and a generic pipeline.

More on our analysis modules



Our Markerless Ecosystem

Applying markers can be combersome, especially with young children, neurological patients and athletes between training blocks. Qualisys offers three markerless routes, and all of them record using Qualisys video cameras. The best route depends on how your lab works.

QTM Powered by PRISMA POSE

QTM Powered by THEIA

ONTRAQ Powered by PRISMA POSE

Prisma Pose is the Qualisys markerless engine for biomechanical analysis that runs inside QTM. Collect using a calibrated Qualisys video system. Data is saved in the same file as marker, force plate and EMG data. Use Qualisys analysis modules or export data for further analysis. No additional support plan required.
Read more

Calibrate and record in QTM with Miqus Video or Miqus Hybrid cameras. Theia3D then tracks the skeleton from the video and processes the data. The analysis modules send the Theia3D output to Visual3D or Calqulus for the report. Theia3D is installed, licensed, and supported separately.
Read more

OnTraq is our end-to end markerless solution for baseline testing of elite sports teams. It uses 8 Miqus OnTraq Video cameras and runs on the Prisma Pose markerless engine. Trend dashboards compare each athlete with their own baseline.
Read more

TRUE HYBRID

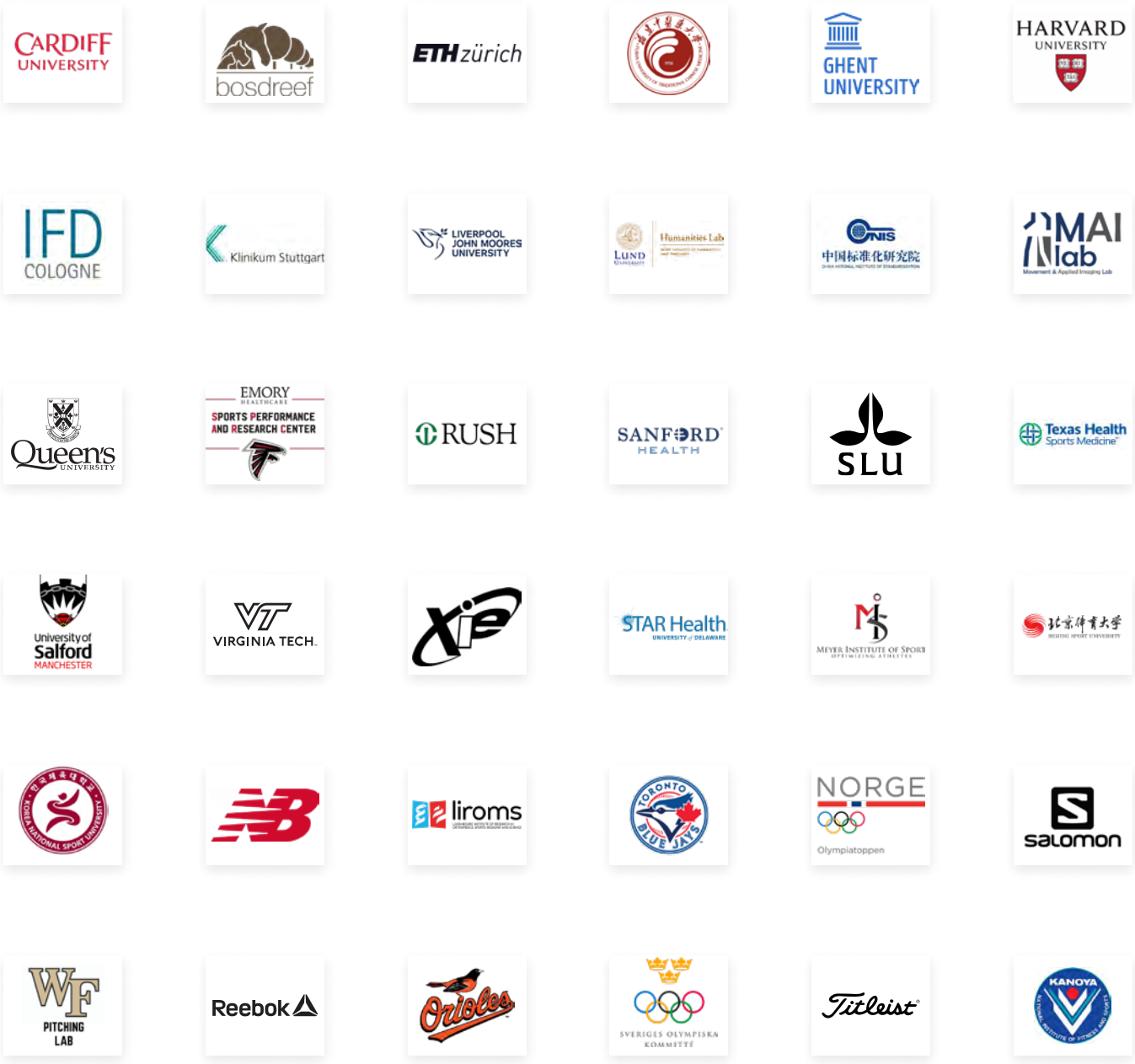
Markers and markerless in one measurement

True Hybrid combines at least 8 Qualisys video cameras with Qualisys marker-based cameras in one measurement. The body is tracked markerless, and objects such as bats, golf clubs and prosthetics are tracked with markers.

QUALISYS

08

Our Clients



QUALISYS

@qualisysmocap



qualisys.com
sales@qualisys.com

Qualisys Europe
Gothenburg, Sweden

Qualisys Americas
Chicago, USA

Qualisys India
Ghaziabad, India

Qualisys Asia Pacific
Singapore