NOKOV

NOKOV

Motion Capture System

Applications in Robotics

NOKOV

Trusted by Robotics Labs in 28 Countries & Regions

AMERICAS & EUROPE

- United States
- United Kingdom
- Germany
- France
- Switzerland
- Belgium
- Netherlands
- Sweden
- Denmark
- Italy
- Spain
- Portugal
- Russia
- Cyprus
- Bulgaria

ASIA & MIDDLE EAST

- China
- Hong Kong SAR
- Macau SAR
- Singapore
- Japan
- South Korea
- Thailand
- Malaysia
- Kazakhstan
- India
- Sri Lanka
- United Arab Emirates
- Israel

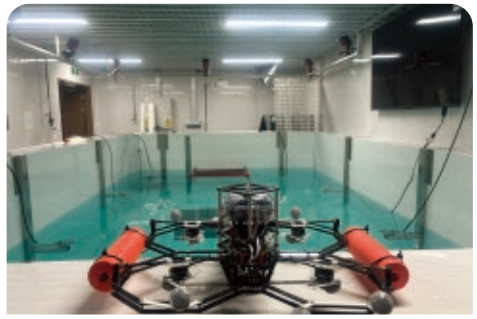
NOKOV

Empowers 1500+ Robotics Labs

University of Zurich[UZH]

Prof. Davide Scaramuzza

Robotics and Perception Group (RPG)
University of Zurich



北京航空航天大學 BEIHANG UNIVERSITY

Prof. Li Wen

Biomechanics and Soft Robotics Lab
Beihang University

Technical University of Munich

Prof. Angela Schoellig

Learning Systems and Robotics Lab (LSY)
Technical University of Munich (TUM)

浙江大學 ZHEJIANG UNIVERSITY

Prof. Fei Gao

Zhejiang University

清華大學 Tsinghua University

Prof. Hang Zhao

MARS Lab
Tsinghua University

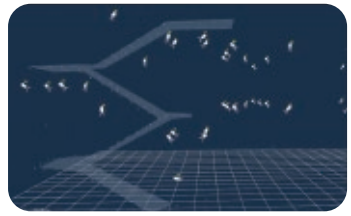
大阪大学 OSAKA UNIVERSITY

Prof. Kensuke Harada & Prof. Weiwei Wan

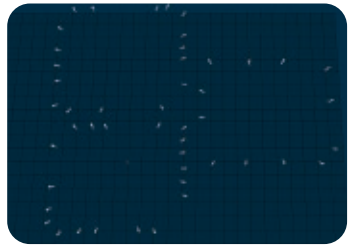
Harada Lab
Osaka University

Built for Any Robotics Scenario

1 Large-Scale Motion Capture and Calibration



- **Unified calibration across multi-level spaces**



- **Unified calibration across three corridor-connected spaces**

- **One-shot calibration for extra-large spaces available within 30 minutes**

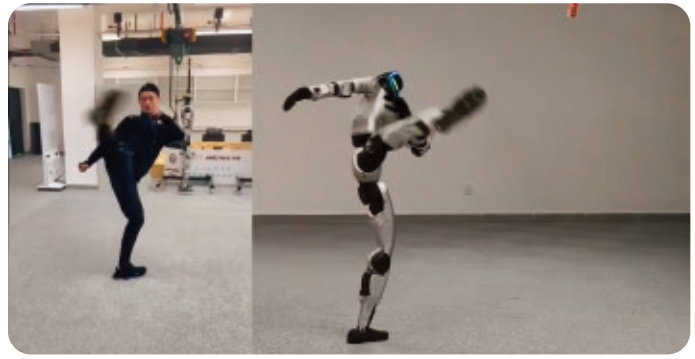
  Sichuan Xuanjie Intelligent Technology Co., Ltd.

2 Outdoor UGV tracking

- **Dedicated cameras for direct sunlight environments**

  Department of Automation, Tsinghua University

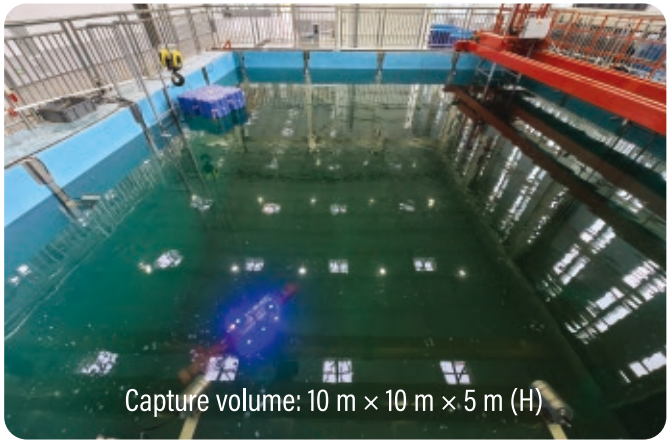
3 Motion Training for Humanoid Robots



- **Broad humanoid URDF support via motion redirection**

  BRAIN Laboratory School of Robotics, Wuhan University

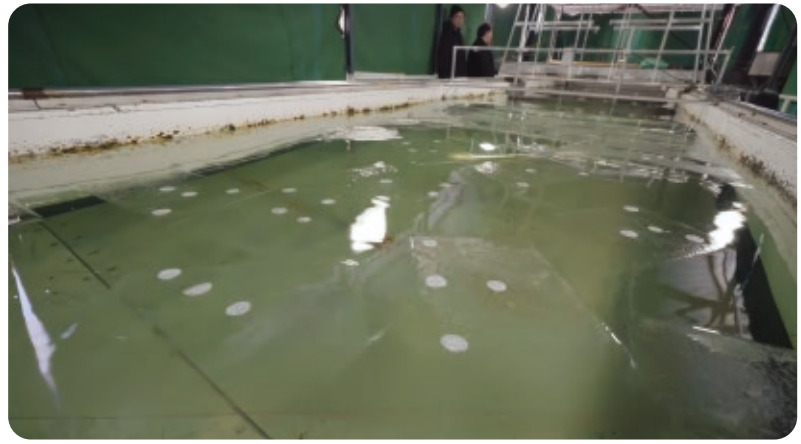
4 Motion Capture in Deep Water



- **Stable deep-water motion capture enabled by active markers**

  Southern Ocean Science and Engineering
  Guangdong Provincial Laboratory (Zhanjiang)

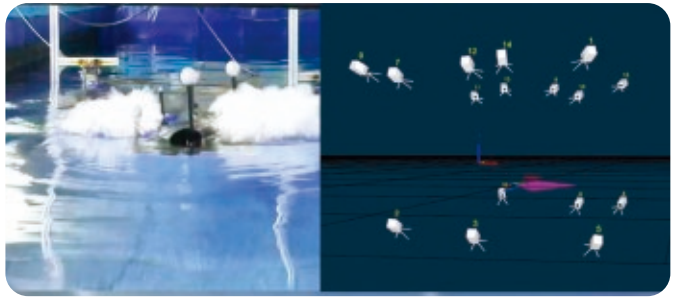
5 Acquire Motion Data of Floating Ice in Water



- **Stable tracking despite reflections from water surfaces and ice**
- **Waterproof marker patches minimize disturbance to the natural motion of the ice**

  Harbin Engineering University

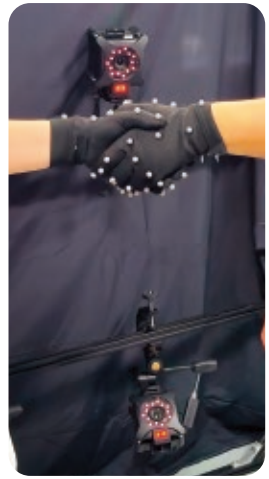
6 Combining Above and Underwater

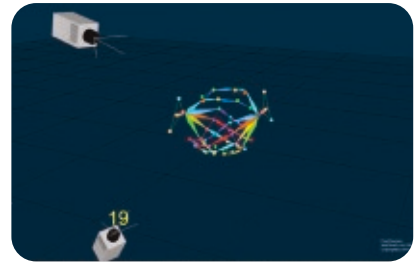


- **Stable tracking of moving objects crossing the water surface**

  School of Mechanical Science and Engineering
  Huazhong University of Science and Technology

7 Hand Motion Capture with Interlaced Fingers





- **Inverse & virtual markers for occlusion handling**
- **Advanced matching and reconstruction algorithms**
- **1.6mm minimum marker size**

Native Integration Across Robotics and Simulation Ecosystems

1 Programming Languages


C


C#


C++


Python


Java


Simulink


MATLAB

2 Protocols

MAVProxy
PyMAVLink
MAVLINK
MAVLink

VRPN
VRPN

SDK
Free SDK

ØMQ
ZMQ

OSC
OSC

3 Simulation Tools

MuJoCo

Isaac Sim
Isaac Sim

QGroundControl
QGroundControl

RViz
RViz

GEAR-SONIC
GEAR-SONIC

4 OS & Platforms


KYLIN

ArduPilot

iOS

Pixhawk


Android

Mac


Raspberry Pi

ROS
ROS2
ROS / ROS2

Crazyswarm
Crazyswarm

FlightMaster
FlightMaster

PX4


Windows


Linux


QGC

5 Multimodal Data Integration

FORCE PLATE & INSTRUMENTED TREADMILLS

BERTEC · h/p/cosmos · AMTI FORCE AND MOTION · KISTLER

EMG

cometa · DELSYS · NORAXON

EEG

COMPUMEDICS NeuroScan

REFERENCE CAMERA

BASLER · HIKVISION · FLIR

PLANTAR PRESSURE MEASUREMENT

MedTrack · SENSOR medica · Rs SCAN LAB LTD

EYE TRACKERS

tobii

NOKOV Motion Capture

SOFTWARE

Visual3D · BoB Biomechanics · ANYBODY TECHNOLOGY · Mokka Motion kinematic & kinetic analyzer · OpenSim

6 Compatible with Leading Robotics Hardware

Metagloves Pro

Xsens MVN Link

UNITREE

Unitree U1/H1 URDF Support

AGIBOT

AGIBOT H2 URDF Support

More URDF

Custom URDF Support

7 Sync Unit

Synchronizes data from multiple external devices with high precision

Easy to Use and Widely Applicable

1 Designed for Real-World Robotics Applications

Rain-ready with a protective waterproof cover

Dedicated models for direct sunlight environments

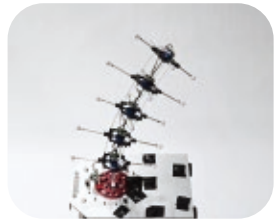
EMC FCC VCCI IP66 IP68

Certified to EMC, FCC, VCCI, IP66, IP68, and more

2 Diverse Target Modeling

Rigid Body

Human Body



Soft Body

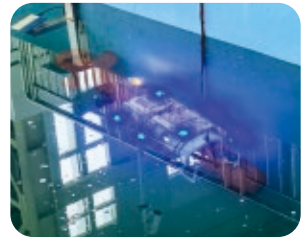
Animal

3 Flexible Marker Options for Diverse Capture Targets

Reflective Marker Patches
For mass-sensitive targets

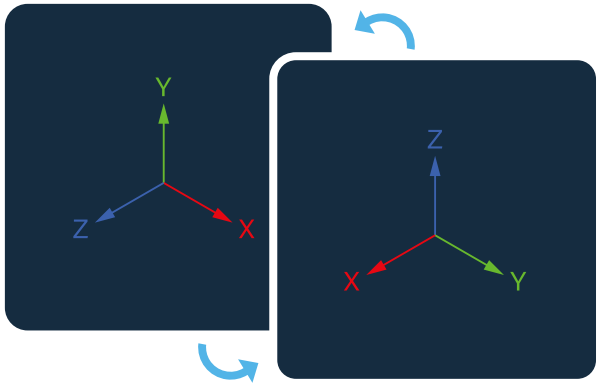
Hemispherical Markers
For compact structures and space-constrained installations

Ultra-Small Markers
(Min. Diameter: 1.6 mm)
For small robots, hand-mo-cap, and dense layouts

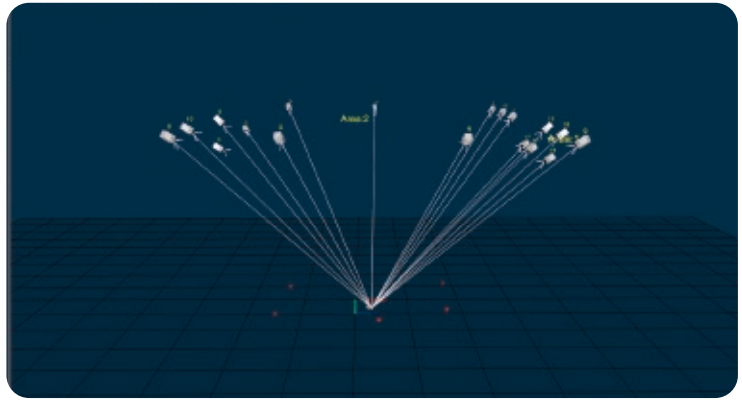


Active Markers
For large capture spaces with extended observation distance

4 In Some Cases, No Recalibration Required

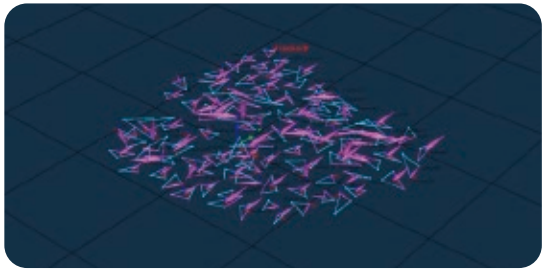


Flexible global coordinate system redefinition

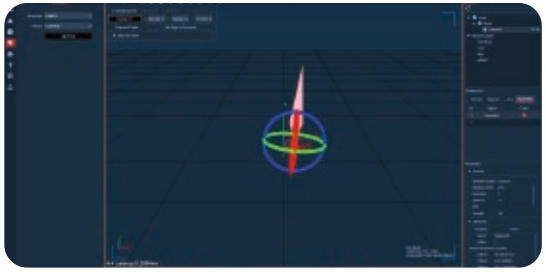


No calibration required for long-term use, adopts self-calibration and anchor calibration technologies

5 Rigid-Body Modeling Features



One-click creation of 300 rigid bodies



Dedicated toolbox for customizing the initial coordinate system of rigid bodies

6 Rich Built-In Templates

30 built-in templates, including dedicated templates for humanoid robots and robotic hands

Product Overview

MARS Series Motion Capture Cameras

Basic Hardware for Optical Motion Capture
Scientifically engineered for core motion capture performance

Model	P/N	Pixels (MP)	Resolution	Frame Rate (FPS)	Latency (ms)	3D Accuracy (mm)	Max Distance (m)	FOV	Outdoor
MARS 1.3H	Mars1.3H-INTL	1.3	1280×1024	240	4.0	±0.2	11	56°×46°	N/A
	Mars1.3HW-INTL	1.3	1280×1024	240	4.0	±0.3	6	95°×74°	N/A
MARS 2H	Mars2H	2.2	2048×1088	380	2.4	±0.15	21	70°×40°	Optional
	Mars2HW	2.2	2048×1088	380	2.4	±0.25	15	104°×55°	N/A
MARS 4H	Mars4H	4	2048×2048	180	5.2	±0.1	32	52°×52°	Optional
	Mars4HW	4	2048×2048	180	5.2	±0.25	20	90°×90°	N/A
MARS 9H	Mars9H	9	4250×2160	300	3.0	±0.05	28	68°×37°	Optional
	Mars9HW	9	4250×2160	300	3.0	±0.2	16	98°×50°	N/A
MARS 14H	Mars14H	14	4608×3072	670	2.0	±0.05	27	68°×45°	N/A
MARS 18H	Mars18H	18	4508×4096	139	5.0	±0.04	28	52°×47°	Optional
	Mars18HW	18	4508×4096	139	5.0	±0.15	20	90°×82°	N/A
MARS 26H	Mars26H	26	5120×5120	150	4.0	±0.03	30	56°×56°	Optional
	Mars26HW	26	5120×5120	150	4.0	±0.1	20	105°×105°	N/A

* For detailed specifications or customized camera options, please contact us.

Underwater Cameras

Basic Hardware for Optical Motion Capture

Tested for 100m depth and versatile for use in all aquatic environments

Model	P/N	Pixels (MP)	Resolution	Frame Rate (FPS)	Latency (ms)	3D Accuracy (mm)	Max Distance (m)	FOV	Depth (m)
MARS 1.3H UW	Mars1.3HW UW	1.3	1280×1024	240	4.0	±0.3	6	95°×74°	100
MARS 4H UW	Mars4HW UW-8-50	4	2048×2048	180	5.2	±0.25	10	74°×74°	50
MARS 9H UW	Mars9HW UW-6-50	9	4250×2160	300	3.0	±0.2	10	98°×50°	50
MARS 18H UW	Mars18HW UW-8-50	18	4508×4096	139	5.0	±0.15	10	73°×67°	50
MARS 26H UW	Mars26HW UW-8-50	26	5120×5120	150	4.0	±0.1	8	83°×83°	50

NOKOV Sync Unit

Basic Hardware for Optical Motion Capture

Seamless real-time motion data integration

Model	InSync-03
Power	PoE or DC12V
Sync Input Source	Genlock | SMPTE/LTC | TTL: 5.5V / 3.3V | Isolated | VESA
Sync Output Source	TTL: 5.5V / 3.3V | SMPTE/LTC | VESA
ExtIO	Customizable Extension Interface, 8CH
Size	66.5(H) × 440(L) × 200(W) mm
Weight	2.7kg

Product Overview

XINGYING

Core Optical Motion Capture Software

Core Feature

- Real-Time Tracking and Visualization
- High-Precision Data Output
- Seamless Integration with Robotics Workflows

Linux

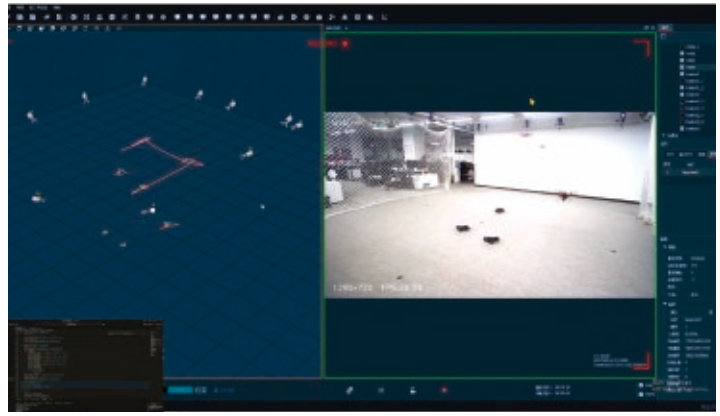
Native Linux Software Support

FlightMaster

Core Software for Multi-Robot Flight Control

Core Feature

- ROS 2-Based Cluster Control
- MATLAB/Simulink Model Design
- Gazebo High-Fidelity Simulation
- Built-In NOKOV Mocap Positioning
- Native PX4 / ArduPilot Support
- From Simulation to Real-World Deployment



ShadowEngine

For Humanoid Robots and Embodied AI

ShadowEngine is an end-to-end platform built on high-precision motion capture data, enabling the full pipeline from human skill capture to robot deployment and continuous improvement, with a closed-loop of data, training, and validation

ShadowEngine | Fusion

Model: **NKV-SE Fusion**

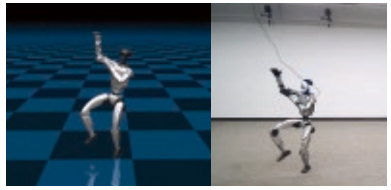
Multi-source Multimodal Data Hub. Real-time aggregation, synchronization & alignment of motion capture, robot sensor, and vision data into unified spatiotemporal streams.

ShadowEngine | ReTarget

Model: **NKV-SE ReTarget**

Motion Retargeting Algorithm Platform. Dynamics-based optimization algorithms for precise human-to-robot motion retargeting, solving morphological differences.

ShadowEngine | Train



Model: **NKV-SE Train**

AI Model Training Factory. High-fidelity physics simulation integrated with mainstream RL frameworks; supports visual task orchestration and large-scale parallel training.

ShadowEngine | TeleOp

Model: **NKV-SE TeleOp**

Teleoperation Platform. High-immersion, low-latency teleoperation interface for recording expert demonstrations as high-quality imitation learning data.

ShadowEngine | Valid

Model: **NKV-SE Valid**

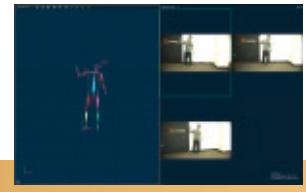
Sim2Real Closed-Loop Validator. Evaluates models on physical robots with quantitative simulation-to-reality comparison, feeding data back into the system for continuous optimization.

ShadowEngine | Source

Model: **NKV-SE Source**

Standardized Data Asset Library. Pre-built high-quality datasets (grasping, gait motion packages) from NOKOV motion capture system — the fuel library for rapid project cold start.

Product Overview



MARS Hybrid Series Motion Capture Cameras

AI-Powered Motion Capture
One camera system for both optical motion capture and AI-based video motion capture

Model	Mode	Pixels (MP)	Resolution	Frame Rate (FPS)	Latency (ms)	3D Accuracy (mm)	Max Distance (m)	FOV
MARS HYBRID 2H	optical motion capture	2.2	2048×1088	350	2.4	±0.15	21	70°×40°
	AI-based video motion capture	2.2	2048×1088	150 @2.2M 220 @1.4M 620 @0.3M		/	/	/

Astra Markerless Motion Capture System

Live

Studio

Professional

AI-Powered Motion Capture
Advanced algorithms enable motion capture with video cameras

Version	Real-Time Interaction	Film Production	Scientific Research Analysis
Frame Rate	60 FPS	60 FPS	160 FPS
Post-processing	X	60 FPS	Limitless
Data Output Format	X	.bvh, .fbx, .trc, .xrs, .xrb, .cap	.bvh, .fbx, .c3d, .trc, .xrs, .xrb, .cap, .force

Global Service and Support

1 One-Time Purchase with Free Software Updates for Multiple Capture Modes

Free Software Updates

Human | Rigid Body | Soft Body

2 Annual Global Training Program

Training Videos Available

3 Global Sales Network with Local Demo Support

Distributors

Switzerland, UK, Germany, France, Netherlands, Poland, Italy

Spain, Austria, Portugal, Russia, Kazakhstan, UAE, Jordan

Singapore, Malaysia, Brunei, Philippines, Thailand, Indonesia, Vietnam

South Korea, Japan, India, Algeria, Tunisia, Morocco

NOKOV

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