Product Introduction

Product overview

Wuji Glove is an intelligent data glove designed for robot teleoperation and human-computer interaction research. It captures tactile perception and posture data from the human hand in real time.

Core Function	Specification	Output
Tactile Sensing	24 × 32 pressure sensor matrix (526 active points)	120 FPS, normalized pressure values 0–1
Pose Tracking	5 EMF modules	120 Hz, finger 3D position and pose
IMU	800 Hz high-frequency sampling	Acceleration + Angular velocity

Typical Application Scenarios:

- Robot dexterous hand teleoperation
- Tactile data collection and research
- Human-computer interaction experiments
- VR/AR gesture input

Specifications

Glove parameters

Detailed technical specifications for the Wuji Glove:

Category	Parameter	Value
Dimensions & Weight	Glove Size (L × W)	215 × 195 mm
	Thickness (Fabric / With Structure)	6.55 mm / 35 mm
	Total Length (With Cable)	340 mm
	Glove Net Weight	67.5 g
	Total Weight (With Cable)	192.6 g
Tactile Sensor	Sensor Type	Pressure Sensor Matrix
	Array Resolution	24 × 32 Pressure Sensor Matrix (526 Active Points)
	Output Rate	120 FPS
	Pressure Range	0 – 20 N
	Pressure Resolution	0.1 N
	Spatial Resolution	4 mm
	Coverage	Full Palmar Side
	Repeatability	≤6%
	Press Life	100,000+
	Flex Life	100,000+
Spatial Tracking	EMF Modules	5 EMF Modules, 6 DOF Each
	Position Accuracy	≤ 2 mm RMS
	Orientation Accuracy	< 5° RMS
IMU	Count / Type	1 × 6-Axis IMU (Dorsum)
	Output Rate	800 Hz
	Accelerometer Range	±16 g
	Gyroscope Range	±2000 °/s
Power & Communication	Power Supply	USB Type-C, 5 V / 1 A
	Data Interface	RJ45 (Via Adapter), 100BASE-TX
	Glove Connector	USB Type-C
Environment	Operating Temperature	-5 – 40 °C
	Storage Temperature	-10 – 70 °C
	Operating Humidity	< 55% RH
	Storage Humidity	< 80% RH

- Repeatability test conditions: Glove samples are mounted on a hard mold fixture. Seven distinct zones on the tactile palm surface are selected. A pressure applicator with a 20 mm diameter flat disc probe applies identical force repeatedly to each zone, and the maximum percentage deviation is calculated.
- Press life / flex life test conditions: Glove samples are worn by a test operator who performs open-grip (to full scale) cycling motions on a cylindrical force measurement device.

EMF specifications

Category	Parameter	Value
EMF Sensor	Output Rate	120 Hz
	Motion-to-Data Latency (Wired)	≤ 10 ms
Hand Kinematics	Sensor Distribution	Thumb, Index, Middle, Ring, Pinky fingertips
	Sensor Data	3-axis position + 3-axis rotation
	Joint Solving	Real-time inverse kinematics full-hand solving + joint angles
Position Tracking	External Tracker Mount	External mechanical interface provided
	Optical Marker Mount	External mechanical interface provided
Environment & Reliability	Interference Resistance	Sensitive to metallic/ferromagnetic materials; recommended clearance ≥ 3 cm
	Reliability	No mechanical wear (sensor body), no electromagnetic hysteresis
Calibration	Calibration Steps	8-step calibration
	Calibration Goal	Prioritize accurate joint angles for improved object interaction and gesture recognition
	Optimization Targets	Bone length, joint pose, fingertip pose

Product components



Component	Description
Glove Palm	• Over 500 pressure sensors distributed across the palm form a high-density tactile sensing array. • Captures and quantifies pressure changes in real time when the palm contacts objects, generating high-resolution hand pressure distribution maps. • During grasping, provides feedback on the force distribution across different palm regions — from light touch to firm grip, faithfully reproducing the operator's interaction force.
Glove Back	• Five EMF modules form a complete hand motion tracking network. • The five modules are located at the fingertips. Using sensor data from these five key nodes combined with kinematics algorithms, the glove calculates each finger's bending angle, spread amplitude, and the overall spatial pose of the palm.
Data Acquisition Board	Wire harnesses from the EMF modules extend through a wire protection sleeve to the data acquisition board on the arm. The indicator LED on the board shows the current glove status.

LED status indicators

Status priority from low to high. Higher-priority states override lower-priority states.

Priority	Indicator	Color	Pattern	Description
0		Off	Off	Power off
15		Cyan	Breathing (4s cycle)	Standby, waiting for host connection
20		Cyan	Heartbeat (50ms on / 1950ms off)	Normal operation, data streaming
30		Green	Fast flash ~5Hz	Fatal error: no available firmware
35		Green	Solid	Self-test / hardware initialization
40		Blue	Fast flash 2Hz	Firmware updating
45		Yellow	Very slow flash 0.5Hz	Host connected but not pulling data
50		Yellow	Slow flash 1Hz	Non-critical warning
90		Red	Slow flash 1Hz	General software error
95		Red	Fast flash 2Hz	Ethernet disconnected
100		Red	Solid	Sensor hardware fault

Product accessories

Image	Accessory	Description
	USB-C to USB-C Cable	Connects the data acquisition board to the USB-C to Ethernet power adapter
	USB-C to Ethernet Power Adapter	Powers the glove and provides Ethernet communication
	• USB-A to USB-C Cable • Ethernet Cable	For subsequent connections via the USB-C to Ethernet power adapter

Software

Access the glove's tactile, EMF, and IMU data through Wuji Studio and Wuji SDK:

Item	Wuji Studio	Wuji SDK
Type	Desktop visualization tool	Python SDK
Core Capabilities	Multi-device management, visualization, firmware upgrade	Real-time tactile data collection, EMF pose data acquisition, IMU data stream, device connection management
System Requirements	Ubuntu 22+	Python 3.10+, Ubuntu 22+