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**NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**GB/T 45501-2025**

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**Industrial robots - Three-dimensional vision-guided system -  
General technical requirements**

工业机器人 三维视觉引导系统 通用技术要求

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### 1 Scope

This document specifies the architecture, basic requirements, functional requirements, performance requirements, Other requirements describe the test methods for performance indicators.

This document is intended to guide enterprises, universities, research institutes and other related institutions to carry out the research and development of industrial robot 3D vision guidance systems and application.

### 2 Normative references

GB/T 12642-2013

GB/T 12643

GB/T 33863.8

GB/T 39005

### 3 Terms and definitions

The terms and definitions defined in GB/T 12643 and GB/T 39005 and the following apply to this document.

#### 3.1 Three-dimensional vision sensor

Combining optics, algorithms and electronics, various principles (such as stereo vision, structured light, time of flight, etc.) are used to calculate the depth of a scene or object.

Device that transmits degree information.

Note. Commonly used in industrial automation, robot navigation, quality inspection, medical imaging, virtual reality and augmented reality.

### **3.2 Three-dimensional vision-guided system**

Use 3D visual perception technology to obtain spatial information (such as shape, position, posture, depth, etc.) of the target object or environment, and The information is processed and analyzed to generate control instructions to guide mechanical devices (such as robots, automation equipment, etc.) to complete precise operations. technical system.

### **3.3 Hand-eye calibration**

Through mathematical modeling and optimization methods, the exact position and posture of the visual system relative to the robot are determined to achieve accurate perception and The process of operation.

Note. Commonly used in robot vision systems to ensure that image data is consistent with actual spatial motion.

### **3.4 System drift self-calibration**

When the system performance drifts due to long-term operation, changes in the external environment, or aging of internal components, the system can