

人形机器人月报：华为加码人形机器人领域；人形机器人产业化渐进

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投资要点：

➤ 政策支持

- **深圳市龙华区最近发布了《深圳市龙华区推动人工智能及机器人产业发展若干措施》。**根据龙华政府在线网站，龙华区人民政府办公室印发了《深圳市龙华区推动人工智能及机器人产业发展若干措施》。该政策的预期目标是打造具有强大吸引力和竞争力的人工智能及机器人集聚区，吸引大量人工智能及机器人企业和创新人才汇聚龙华。预期在未来数年内，区内高新技术企业数量实现显著增长，打造一批人工智能及机器人专业园区。同时，通过政策扶持，鼓励企业加大研发投入，加速科技成果转化效率，推动人工智能及机器人产业成为龙华区创新发展、经济增长的重要引擎。
- **重庆市支持具身智能机器人产业创新发展。**根据重庆市经济和信息化委员会等七部门，2024年12月5日，重庆市为支持具身智能机器人产业创新发展出台的若干政策措施。《政策措施》主要内容分构建产业创新体系、加强产品应用推广、提升产业生成能力、强化发展要素支撑、加强协调联动五部分共12条。以构建产业创新体系为例，包括支持创新平台建设和推动关键技术攻关两个方面。支持创新平台建设主要包括组建产业研究院、产业创新综合体、制造业创新中心，建设企业技术中心、产业技术工程化中心、重点实验室、概念验证中心等；推动关键技术攻关主要包括两方面，一方面是针对机器人硬件和操作系统，通过部署市级科技创新重大重点项目推动发展；另一方面是针对具身大模型生态体系相关技术，通过“揭榜挂帅”方式推动发展。

➤ 整机动态

- **华为入局具身智能，首批签约16家合作机器人企业。**根据深圳市智能传感行业协会微信公众号，11月15日，华为（深圳）全球具身智能产业创新中心宣布正式运营，该中心由华为与深圳前海合作区管理局共同合作建立，致力于瞄准国际前沿技术，以产业示范应用场景为牵引，开展技术攻关和联合创新，共同打造世界级具身智能产业创新中心；在同步举行的合作备忘录签署仪式上，乐聚机器人、兆威机电、中坚科技、埃夫特、禾川人形机器人等16家企业共同与华为（深圳）全球具身智能产业创新中心企业签约。
- **特斯拉发布 Optimus 人形机器人新动态。**根据中国机器人网微信公众号，2024年12月1日，特斯拉 Optimus 人形机器人的最新进展。在一段为庆祝感恩节而发布的视频中，Optimus 展示了其能够接住扔给它的网球的能力。特斯拉首席执行官埃隆·马斯克对此表示祝贺。Optimus 工程师米兰·科瓦奇详细介绍了第二代 Optimus 在手腕灵活性上的提升，手部拥有22个自由度，腕部有3个，这些设计模仿了人类肌腱结构，使得 Optimus 能够更自然流畅地完成复杂任务。

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- **现代汽车 X-ble Shoulder 外骨骼机器人。**根据中国机器人网微信公众号，2024 年 12 月 3 日，现代汽车公司和起亚在可穿戴机器人技术日上展示的 X-ble Shoulder 外骨骼机器人。这款机器人旨在减少工作场所的安全风险并提高工人效率。现代汽车表示，佩戴 X-ble Shoulder 后，员工的肩部负荷减少了 60%，肌肉活动减少了 30%。在汽车底盘维修等需要举过头顶的作业场景中，X-ble Shoulder 能显著增强上臂力量，保护肌肉骨骼系统，避免职业损伤。X-ble Shoulder 有两个版本：基础版适合需要更大活动范围的工作，提供约 2.9 公斤的辅助力；可调节版专为重复性任务设计，提供约 3.7 公斤的辅助力。现代计划在 2025 年将其推广至集团旗下 27 家关联公司及其他行业，并在 2026 年进军欧美市场。

- **MagicBot 人形机器人进场“打工”。**根据中国机器人网微信公众号，2024 年 12 月 4 日，人形机器人公司魔法原子(MagicLab)发布了其产品 MagicBot 的最新进展。MagicBot 已成功进驻工厂产线，执行产品检测、物料搬运、零件取放、扫码入库等多项作业训练。视频中展示的多台 MagicBot 在工厂环境中实现了小范围协作，例如一台机器人搬运物料至另一台机器人工位，后者再将零件放置于生产设备上。魔法原子成立于 2024 年 1 月，专注于机器人技术和人工智能技术研发与应用，其产品线涵盖通用型人形机器人和仿生四足机器人，预计将在家庭、工业、商业等多个场景中得到应用。

➤ 核心零部件动态

- **兆威机电推出灵巧手。**根据兆威机电微信公众号，11 月 14 日，兆威机电发布人形机器人灵巧手产品。兆威灵巧手配备 17 个主动自由度，其中单指节独立驱动，拥有 3 个及以上主动执行单元，精准模拟人手部的抓握等精细动作，赋能机器人未来终端场景。

➤ 投融资动态

- **银河通用机器人完成 5 亿人民币战略轮融资。**根据银河通用机器人微信公众号，11 月 20 日，银河通用机器人宣布完成 5 亿元人民币的战略轮融资。本轮融资由上汽恒旭、香港投资公司 HKIC、上海人工智能产业基金、深创投、北京机器人产业基金、建银国际、智友科学家基金、容亿投资、金景资本等多家知名投资机构参与。此外，老股东 IDG、经纬、蓝驰、北京人工智能产业基金等也继续大幅追加投资。成立一年半时间，银河通用已获得多方投资，累计融资超 12 亿元，得到多地政府基金的共同加持，同时云集国内外知名投资人、知名科研机构、强大的产业战略投资人。

- **埃斯顿酷卓获 1.3 亿元融资。**根据观潮新消费网站，11 月 11 日，江苏省战略性新兴产业母基金首批产业专项基金对首个直投项目——南京埃斯顿酷卓科技有限公司完成投资协议签署，标志着省级母基金和首批产业专项基金投资工作正式启动。此举标志着省级母基金和首批产业专项基金投资工作正式启动。本次融资是埃斯顿酷卓首次引入外部投资人。江苏南京软件和信息服务产业专项母基金直接投资 3000 万元，撬动国家先进制造业基金投资 1 亿元，共同助力企业完成 1.3 亿元融资目标。本次投资将围绕埃斯顿具身智能和机器人控制算法核心逻辑，助力埃斯顿在传统六轴之外共同孵化代表未来发展方向的新业务，带动江苏省信息技术行业发展，优化产业布局。

- **投资建议。**12 月人形机器人建议关注标的：拓普集团、三花智控、贝斯特、鼎智科技、柯力传感、优必选、汇川技术、伟创电气、索辰科技。

- **风险提示。**人形机器人产业化进度不及预期、政策推动不及预期等。

表 1 2021-2024 年国家层面人形机器人相关政策/计划

时间	相关部门	政策/计划	相关内容摘要
2024	工业和信息化部等七部门	关于推动未来产业创新发展的实施意见	做优信息服务产品，发展下一代操作系统，推广开源技术；做强未来高端装备，突破人形机器人、量子计算机等产品...
2024	工业和信息化部、应急管理部	关于加快应急机器人发展的指导意见	到 2025 年，要研发一批先进应急机器人，大幅提升科学化、专业化、精细化和智能化水平；建设一批重点场景应急机器人实战测试和示范应用基地，逐步完善发展生态体系...
2023	工业和信息化部	人形机器人创新发展指导意见	打造人形机器人“大脑”和“小脑”、突破“肢体”关键技术、健全全技术创新体系。打造整机产品、夯实基础部组件、推动软件创新。
2023	工业和信息化部、教育部等	“机器人+”应用行动实施方案	聚焦 10 大应用重点领域，突破 100 种以上机器人创新应用技术及解决方案，推广 200 个以上具有较高技术水平、创新应用模式和显著应用成效的机器人典型应用场景...
2021	工业和信息化部	“十四五”机器人产业发展规划	到 2025 年，机器人产业营业收入年均增速超过 20%；形成一批具有国际竞争力的领军企业及一大批创新能力强、成长性好的专精特新“小巨人”企业，建成 3-5 个有国际影响力的产业集群；制造业机器人密度实现翻番...
2021	工业和信息化部等八部门	“十四五”智能制造发展规划	到 2025 年，规模以上制造业企业大部分实现数字化网络化，重点行业骨干企业初步应用智能化；到 2035 年，规模以上制造业企业全面普及数字化网络化，重点行业骨干企业基本实现智能化...
2021	工信部、国家卫生健康委	健康养老产业发展行动计划（2021-2025 年）	推进物联网、大数据、云计算、人工智能、区块链等新一代信息技术以及移动终端、可穿戴设备、服务机器人等智能设备在居家、社区、机构等养老场景集成应用...

资料来源：CMR 人形机器人联合体微信公众号，HTI

表 2 2021-2024 年各省市人形机器人相关政策/计划

时间	省市	政策/计划	相关内容摘要
2023	北京市	北京市机器人产业创新发展行动方案 (2023-2025 年)	加紧布局人形机器人, 对标国际领先人形机器人产品, 支持企业和高校院所开展人形机器人整机产品、关键零部件攻关和工程化, 加快建设北京市人形机器人产业创新中心...
2023	北京市	北京经济技术开发区机器人产业高质量发展三年行动计划 (2023-2025 年)	到 2025 年, 机器人研发投入年复合增长率达 50% 以上, 搭建 50 个机器人应用场景示范项目, 规上工业企业机器人密度达到 360 台/万人, 产值规模达到 100 亿元...
2023	北京市	北京市促进机器人产业创新发展的若干措施	由机器人骨干企业牵头, 整合国内外一流创新资源, 组建人形机器人创新中心, 开展关键共性技术研究。支持机器人企业与“智能机器人与系统高精尖创新中心”联合开展产业化攻关...
2023	上海市	上海市推动制造业高质量发展三年行动计划 (2023-2025 年)	瞄准人工智能技术前沿, 构建通用大模型, 面向垂直领域发展产业生态, 建设国际算法创新基地, 加快人形机器人创新发展...
2023	上海市	上海市建设具有全球影响力的科技创新中心“十四五”规划	研发高端精密减速器、控制器、伺服电机等基础部件, 突破机器人轻量化设计、多轴驱控一体化、信息感知与导航、机器人操作系统、人机交互与自主编程等共性关键技术...
2023	上海市	上海市促进智能机器人产业高质量发展创新发展行动方案 (2023-2025 年)	到 2025 年, 打造具有全球影响力的机器人产业创新高地; 促进三个突破, 在品牌、应用场景和产业规模方面实现“十百千”突破; 建设三个公共服务平台...
2024	上海市	《人形机器人分类分级应用指南》和《具身智能智能化等级分级指南》	明确了人形机器人在结构外观、移动方式、智能模型等方面的分类, 并根据具身智能、下肢运动、上肢作业、应用环境等因素划分技术等级, 以及根据感知、认知、决策、自主等核心能力划分智能化等级...
2022	广东省	广东省新一代人工智能创新发展行动计划 (2022-2025 年)	支持在机器学习自动化、大数据智能、通用基础模型、无监督跨模态大模型、人机混合群体智能、知识理解与推理、协同控制与优化决策、可解释人工智能等领域开展技术攻关...
2021	广东省	广东省培育智能机器人战略性新兴产业集群行动计划 (2021—2025 年)	到 2025 年, 智能机器人产业营业收入达到 800 亿元, 其中服务机器人行业营业收入达到 200 亿元, 无人车 (船) 行业营业收入达到 500 亿元, 工业机器人年产量超过 10 万台...
2023	广东省	深圳市加快推动人工智能高质量发展水平应用行动方案 (2023-2024 年)	聚焦通用大模型、智能算力芯片、智能传感器、智能机器人、智能网联汽车等领域, 实施人工智能科技重大专项扶持计划, 重点支持基于国内外芯片和算法的开源通用大模型...
2022	广东省	深圳市人民政府关于发展壮大战略性新兴产业集群和培育发展未来产业的意见	重点发展工业机器人、服务机器人、特种机器人、无人车 (船) 等领域, 突破减速器、控制器、伺服系统等关键零部件和集成应用技术, 扩展智能机器人在电子信息制造、汽车、航空航天等高端制造应用场景...
2024	广东省	深圳市龙华区推动人工智能及机器人产业发展若干措施	为人工智能赋能千行百业提供支持, 通过发放算力券为企业提供补贴, 补贴额度不超过企业采购金额的 30%, 上限不超过 300 万元...
2024	广东省	东莞市支持智能机器人产业发展若干措施	抢抓人形机器人发展机遇。立足特色和产业优势, 通过降低门槛, 提高资助比例和资助额度等方式给予倾斜性政策支持, 招引和培育人形机器人企业, 促进产业汇聚发展...
2023	广东省	佛山市机器人及相关产业发展规划 (2023-2030 年)	至 2025 年, 佛山机器人及相关产业营收从 515 亿元增长到 1000 亿元, 用三年时间实现倍增。至 2030 年, 机器人及相关产业营收从 1000 亿元增长到 2000 亿元...
2024	江苏省	江苏省机器人产业创新发展行动方案	到 2025 年, 我省机器人产业链规模达 2000 亿元左右, 机器人核心产业规模达到 250 亿元以上, 成为全国机器人产业创新发展和集成应用高地; 到 2027 年, 我省机器人产业综合实力达到国际先进水平...
2023	江苏省	江苏省关于培育发展未来产业的指导意见	谋划布局量子科技、深海深地空天、类人机器人、先进核能等一批前沿性未来产业, 初步形成“10+x”未来产业体系...
2021	江苏省	江苏省“十四五”制造业高质量发展规划	大力发展消防应急、智能巡检等特种机器人和手术诊疗、康复养护等服务机器人, 进一步提升高性能减速器、高精度伺服驱动系统、先进控制器、新型智能传感器等核心零部件自主可控水平...
2023	江苏省	苏州市人工智能产业创新集群行动计划 (2023-2025 年)	聚焦人工智能关键核心技术领域, 在语音识别、自动驾驶、计算机视觉、自然语言处理、机器人等优势领域加强研发投入, 实现核心技术突破...
2023	湖北省	湖北省数字经济高质量发展若干政策措施	鼓励省内企业联合科研院所面向未来产业, 开展 6G、量子科技、人形机器人、元宇宙、人工智能等领域原创性研发, 对相关企业享受研发费用加计扣除超出上一年度的增量部分给予补助...
2022	湖北省	湖北省人工智能产业“十四五”发展规划	大力发展智能服务机器人, 以智能感知、模式识别、智能分析和智能决策为重点, 推进教育娱乐、医疗康复、养老陪护等特定应用场景的智能服务机器人研发及产业化...
2022	天津市	天津市智能制造发展“十四五”规划	重点培育一批专业性强、行业特色明显的智能制造系统集成服务商和一批具备整体设计能力和解决方案提供能力的专业化机器人及智能装备系统集成企业, 开展自主品牌机器人和智能装备的应用示范和系统集成服务...
2021	浙江省	浙江省高端装备制造业发展“十四五”规划	开展伺服电机、精密减速器、伺服驱动器、执行器、传感器、人机物交互系统等机器人关键核心部件工程化攻关。开展整机、部件、集成应用等机器人关键共性技术攻关...
2023	浙江省	浙江省人民政府办公厅关于培育发展未来产业的指导意见	发展仿生机器人。开展仿生感知认知、生机电融合、人工智能视觉导航等技术研究突破与系统集成, 强化商用场景和个人、家庭应用场景探索...
2024	四川省	成都市人民政府关于前瞻培育未来产业构筑高质量发展新动能的实施意见	促进算法、算力、数据的融合提升和系统应用, 打造数实融合、虚实结合的数字产业新形态, 重点培育人形机器人、类脑智能、元宇宙、柔性电子、先进计算及数据服务等细分领域...
2024	安徽省	安徽省人形机器人产业发展行动计划 (2024—2027 年)	到 2027 年, 围绕“23456”目标体系, 初步构建安徽省人形机器人创新体系和产业生态, 形成产业化能力。到 2030 年, 人形机器人产业化进程加速, 应用场景更加丰富, 相关产品深度融入实体经济, 建成国内有重要影响力的人形机器人产业发展高地...
2023	河北省	河北省支持机器人产业发展若干措施	重点在五个方面发力推进机器人产业高质量发展。编制机器人创新应用案例集推广 100 项基于“机器人化”的智能制造和工业互联网创新发展重点项目...
2021	福建省	福建省“十四五”制造业高质量发展专项规划	围绕汽车、机械、电子、轻工、化工和危险品制造等工业机器人特定机器人, 以及医疗健康、家庭服务、教育娱乐等服务机器人应用...
2022	山东省	山东省“十四五”战略性新兴产业发展规划	以机器人整机制造为牵引, 加快突破高精度减速器、高性能控制器、传感器与末端执行器等关键技术与核心零部件...
2024	山东省	山东省促进人形机器人产业创新发展实施方案 (2024—2027 年)	以技术突破、产品创新、场景应用、生态培育为重点, 山东将加快推进人形机器人自主化、智能化、高端化发展, 到 2025 年, 人形机器人创新体系初步建立, 整机产品实现批量生产, 在制造、民生、服务等领域得到示范应用...
2023	江西省	江西省未来产业发展中长期规划 (2023-2035 年)	以南昌、九江、吉安、赣州、新余等为重点, 推动人工智能与机器人技术深度融合, 突破机器人系统开发、操作系统等共性技术以及研发仿生感知与认知、生机电融合等前沿技术, 构建智能机器人创新生态和发展体系...
2024	重庆市	支持具身智能机器人产业创新发展若干政策措施	支持创新平台建设主要包括组建产业研究院、产业创新综合体、制造业创新中心, 建设企业技术中心、产业技术工程化中心、重点实验室、概念验证中心等; 推动关键技术攻关主要包括两方面, 一方面是针对机器人硬件和操作系统, 通过部署市级科技创新重大重点项目推动发展; 另一方面是针对具身大模型生态体系相关技术, 通过“揭榜挂帅”方式推动发展...
2023	重庆市	重庆市 AI 及服务机器人产业集群高质量发展行动计划 (2023—2027 年)	到 2027 年, 全市 AI 及服务机器人产业集群建设取得重要进展, 人工智能算力显著增强, 服务机器人领域 AI 技术研发能力和应用深度走在全国前列...

资料来源: CMR 人形机器人联合体微信公众号, 安徽省工业和信息化厅, 山东省工业和信息化厅, 山东省人民政府, 重庆市经济和信息化委员会, HTI

APPENDIX 1

Summary

Investment Highlights:

Policy Support

Shenzhen Longhua District released measures to promote AI and robotics. The goal is to create an attractive AI and robotics hub, drawing companies and talent. Significant growth in high-tech firms and specialized parks is expected. Policies encourage R&D investment, accelerating tech conversion, making AI and robotics key to Longhua's innovation and growth.

Chongqing supports embodied intelligent robotics innovation. Policies focus on building an innovation system, product promotion, industry capacity, development support, and coordination. For innovation, it includes establishing research institutes and tech centers, and tackling key technologies in robotics hardware and systems through major projects.

Industry Dynamics

Huawei enters embodied intelligence, partnering with 16 robotics firms. The Huawei Global Embodied Intelligence Innovation Center in Shenzhen aims at cutting-edge tech and joint innovation. Companies like Leju Robotics and Zhaowei Machinery signed cooperation agreements.

Tesla's Optimus humanoid robot shows new capabilities. A video demonstrated Optimus catching a tennis ball, with CEO Elon Musk congratulating the team. Engineer Milan Kovac highlighted improvements in wrist flexibility, with 22 degrees of freedom in the hand and 3 in the wrist, mimicking human tendon structure for complex tasks.

Investment Advice

December humanoid robot targets: Tuopu Group, Zhejiang Sanhua Intelligent Controls, Wuxi Best Precision Machinery, Jiangsu DINGS Intelligent Control Technology, Keli Sensing Technology (Ningbo), Ubtech Robotics Corp Ltd, Shenzhen Inovance Technology, Veichi, Shanghai Suochen Information Technology Co.,Ltd.

Risk Warning

Humanoid robot industrialization and policy support may be weaker than expected.

附录 APPENDIX

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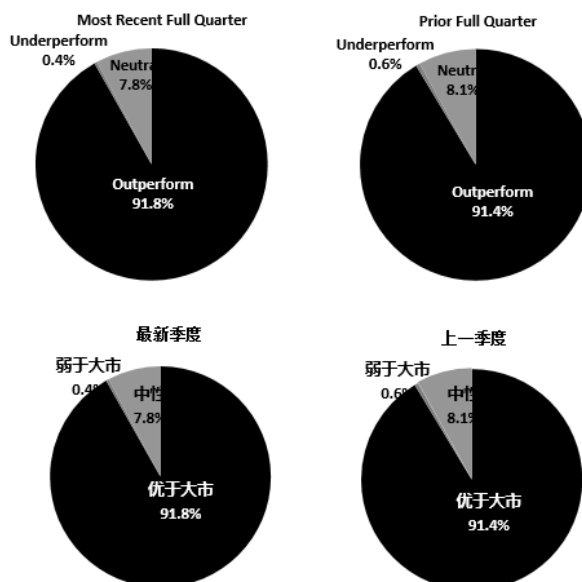
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Ratings Distribution



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卖出，未来 12-18 个月内预期相对基准指数跌幅在 10%以上，基准定义如下

各地股票基准指数：日本 – TOPIX, 韩国 – KOSPI, 台湾 – TAIEX, 印度 – Nifty100; 其他所有中国概念股 – MSCI China.

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Outperform	Neutral (hold)	Underperform
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*Percentage of investment banking clients in each rating category.

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