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Humanoid robotics “Made in Italy”

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Generative Bionics – Company Profile

Generative Bionics is an Italian company founded on research and technologies developed at the Italian Institute of Technology (IIT) and dedicated to building intelligent humanoid robots based on Physical AI. The company integrates robotics, artificial intelligence, and design to develop humanoids designed to operate safely and reliably in real-world settings, prioritizing industrial use cases.

Rooted in more than 15 years of frontier research - including the development of **iCub**, the Italian Institute of Technology's iconic platform for exploring the link between physical interaction and cognition - Generative Bionics is ushering in a new generation of **autonomous, safe, and collaborative humanoid robots** that perceive, learn, and act in the real world. Our vision is human-first: bringing together AI, mechatronics, and human sensitivity into a single, integrated project. By **giving AI a body,** we aim to create robots that are truly useful, understandable, and capable of becoming active partners in the future of work.

Generative Bionics builds on the strengths of Italy's and Europe's production model - highly flexible small and mid-sized manufacturers, often with artisanal or semi-automated processes. In these hybrid environments, **humanoid robots** are a natural extension of human work: collaborative, adaptable, and able to operate alongside people without overhauling existing facilities.

The company emerges amid profound economic and demographic shifts. Aging populations and shrinking workforces are redefining productivity and industrial competitiveness. In this context, **intelligent automation is no longer optional** - it's a strategic necessity for sustainable growth.

Our mission is to **digitize and amplify human work**, translating the manual skill and cognitive expertise of "Made in Italy" into codified, transferable capabilities. In doing so, Generative Bionics safeguards national competitiveness and advances a model of technology that supports **creativity, sustainability, and the dignity of work**.

Mission – Amplifying Human Capability through Physical AI

Generative Bionics was created to **amplify human capability** by developing a new generation of intelligent robots designed to **collaborate with people** rather than replace them.
Through **Physical AI**, artificial intelligence takes on a physical form: a partner that extends human strength, precision, and cognition. It assumes dangerous, repetitive, or physically demanding tasks so that humans can focus on what they do best: **creativity, control, and innovation**.

Our mission rests on a simple yet radical principle: **technology must serve humanity**, enhancing human dignity and potential. We design solutions that combine **safety, adaptability, and collective well-being**, building a harmonious relationship between automation and the human spirit.

Vision

Generative Bionics has a clear, ambitious goal: **build Italian humanoid robots** that serve people. Our **human-first** philosophy guides every technical and strategic choice. We want to build robots that move, learn, and interact naturally, integrating seamlessly into human-designed spaces.

As demand for automation accelerates, a common mismatch is emerging: most automation technologies are designed for fully automated, standardized factories, but many businesses - especially in Italy - operate in **hybrid** environments where manual skill, experience, and on-the-spot adjustments are essential. Our robots bridge this gap, adapting to **real spaces and changing processes** without requiring dedicated infrastructure or replacing **human work**.

At our core is **Physical AI**: not software confined to a screen, but intelligence given a body capable of **perceiving, acting, and learning** directly from the physical world. Cognition doesn't arise from abstract computation alone, it is shaped through sensorimotor experience. A robot that feels the weight of an object or the fragility of a surface acquires a form of understanding that no purely symbolic system can match.
Our systems combine rich sensing (vision, touch, force, proprioception) with advanced actuators and **multimodal AI** that fuses visual, tactile, and language inputs into a unified contextual model. This enables **semantic grounding**: when the robot hears "fragile," it links the word to a concrete physical sensation rather than an abstract label.

Embodiment also accelerates learning. With **teleoperation platforms and patented sensorized suits**, human operators can "teach" robots directly. The AI observes, imitates, and generalizes - turning expert gestures into autonomous competence. Over time, this becomes a **symbiotic collaboration**: increasingly adaptive partners that learn new skills on their own and contribute creatively to problem-solving.

Market Context and Opportunity

The global economy is undergoing one of the deepest demographic transitions in modern history. Labor shortages, population aging, and mounting productivity pressures are reshaping how we produce, work, and organize society. By 2050, the global 65+ population will roughly **double** (United Nations, *World Social Report 2023* e in Our World in Data, *Global Ageing Data Insights*).

In advanced economies, the impact is already visible. Over **20%** of Europe and Japan is now 65+, and Italy exceeds **24%** (Eurostat, *Population structure and ageing*). Fewer workers will support more retirees, with knock-on effects for **productivity, competitiveness, and welfare systems**. In this landscape, **flexible, light-touch automation** becomes systemic necessity - not just an efficiency play. **Humanoid robots** are the most advanced answer: they can fill unappealing or unstaffed roles and integrate into existing spaces **without costly retooling**.

Industrial Transformation: From Industry 4.0 to 5.0

We're moving from digitization to **human–machine collaboration**. Factories of the future will be reconfigurable, flexible, and interactive spaces where people and machines **share tasks**. Humanoids are the most advanced form of flexible automation: they learn new jobs, move freely between stations, use existing tools, and adapt in real time. The payoff isn't just productivity - it's **safety and worker well-being**.

Analysts project a massive market: Morgan Stanley (2024) estimates the humanoid sector could exceed **$5T annually by 2050**, with up to **1 billion** units in operation - roughly twice the combined sales of today's top 20 automakers. Nearer term, multiple firms forecast **$150–$180B by 2035**, driven by AI advances and persistent labor shortages.

The European Opportunity - and Our Role

Generative Bionics rides both sides of the curve: real demand (labor gaps and need for flexible automation) and maturing supply (Physical AI ready for deployment). Our aim is to help position **Italy and Europe** as leaders in a space now dominated by North American and Asian initiatives - setting **global standards** that prioritize safety, ethics, and social utility.

Handled well, the impact is historic: humanoids can sustain productivity, support welfare systems, and **elevate human work**. Technology doesn't replace people; it **amplifies** them. It doesn't automate creativity; it **frees** it. This is a distinctly **European path to Physical AI** - an alliance of science, industry, and social values.

Industrial Strategy and Near-Term Roadmap

Generative Bionics follows a **measured, evidence-based rollout**. Phase one targets high-intensity industries where humanoids can immediately improve **productivity and safety**: advanced manufacturing, automotive, aerospace, heavy industry, and data centers. These are environments with acute labor gaps and demanding, sometimes hazardous tasks.

As performance is proven in these verticals, we will **expand** into higher-interaction domains (such as **healthcare and surveillance)**, where robots can assist with repetitive or logistics-heavy work - shelf management, materials handling, and service support. Each expansion is gated by **performance, safety, and user-acceptance metrics** to build trust and ensure responsible adoption.

Generative Bionics – the origins

Generative Bionics draws on IIT Genoa's scientific excellence, which has placed Italy on the global robotics map over the past two decades. Generative Bionics inherits the experience and results of **iCub** and **ergoCub**, the humanoid platforms that form our technological foundation.

- **iCub** (since 2004): the child-sized, open-source humanoid that revolutionized research into cognition and embodiment. With **51 units** deployed worldwide, it enabled more than 15 years of breakthroughs in how physical interaction shapes intelligence - establishing IIT as a global leader.
- **ergoCub** (since 2021, with INAIL): the evolution of iCub for **safe human–robot collaboration**, with major gains in ergonomics and natural interaction. Development time dropped to ~1 year (vs. 3–4 for iCub), demonstrating an agile approach tailored to real industrial timelines.
- **iRonCub** (2019 concept): the first humanoid envisioned to fly using jet propulsion - symbolic of IIT's ambition and of the generative drive behind the new enterprise - pointing toward future use cases like disaster-response "humanoid drones."

This heritage gives Generative Bionics a **unique asset base**: years of research generating knowledge, technologies, and patents - plus concrete proof that humanoids can be **reliable, scalable platforms** that adapt quickly to industrial needs. It is no coincidence that Genoa is increasingly referred to as Italy's "Robot Valley": the city hosts a unique ecosystem made up of leading institutions (IIT, CNR, University of Genoa) and innovation programs such as the **RAISE** ecosystem and the **RoboIT** Technology Transfer Hub promoted by CDP Venture Capital. These projects have made Genoa a European reference point for robotics and artificial intelligence.

Team

Generative Bionics brings together seasoned executives and internationally recognized researchers to bridge **frontier science** and **global markets** - balancing visionary R&D with disciplined execution.

- **Daniele Pucci – CEO & Co-Founder**
  He was head of IIT's **Artificial and Mechanical Intelligence (AMI)** line. Creator of **iRonCub** (the first jet-propelled humanoid) and a **MIT Technology Review Innovator Under 35 (2019)**. As CEO, he translates scientific vision into industrial strategy – ensuring that innovation serves **safety, reliability, and social utility**.
- **Alessio Del Bue – Chief AI Officer & Co-Founder**
  Pioneer in 3D computer vision and multimodal machine learning; author of **200+ publications**; former head of IIT's **Pattern Analysis & Computer Vision** lab. He leads AI from perception to robotic cognition, ensuring state-of-the-art, **ethically designed** systems that meet the highest standards of safety, transparency, and interoperability.
- **Marco Maggiali – Chief Technology Officer & Co-Founder**
  Mechatronics engineer with 20+ years in applied robotics; former coordinator of **iCub Tech** at IIT, transforming academic prototypes like iCub and ergoCub into **industrial-ready, replicable platforms**. He oversees technical direction and the integration of hardware, software, and production, focusing on **quality and reliability**.

- **Andrea Pagnin – Chief Business Officer & Co-Founder**
  Former Head of Innovation of IIT, he is an expert in technology transfer, innovation marketing, and industrial strategy with two decades connecting research and markets. He leads business development, strategic partnerships, and growth models - critical to scaling humanoid adoption at market pace.
- **Davide Rota – Executive Chairman & Co-Founder**
  Serial entrepreneur with 30+ years in tech and telecoms (Linkem, Tiscali). He steers governance and scale-up strategies, bringing deep experience in complex markets and **long-term value creation**.
- **Jeffrey Libshutz – Co-Founder & Early Investor**
  U.S. entrepreneur and investor with a strong venture background across Silicon Valley and the East Coast. He builds a **strategic bridge** to the American ecosystem - investors, industrial partners, and institutions - accelerating global positioning.

Today, Generative Bionics counts **~80 professionals**, forming the largest European team dedicated to humanoid robotics, with **350+ scientific publications**, dozens of patents, **75+ years** of combined startup leadership, and **600+ years** of cumulative robotics experience. The hiring plan foresees **400+** additional roles within five years and **1,000+ by 2035** (not limited to Genoa HQ).

Investors

Generative Bionics is backed by a network of strategic partners and top-tier investors bringing **capital, capabilities, and industrial synergies**.

- AMD Ventures **– Investor & Technology Partner** – AMD Ventures is the strategic investment arm of AMD, investing in innovative AI companies to drive the next generation of breakthrough AI solutions.
- CDP Venture Capital SGR **– Lead Investor:** – It is an SGR - asset management company - 70% owned by CDP Equity and 30% by Invitalia, established with the goal of building the future of Italy by placing innovation at the heart of the country's economic development. It invests in a new generation of entrepreneurs so Italy can regain its driving role across the creative industries, science and technology, fields that have always defined us. CDP Venture Capital manages 15 investment funds, with over €4.7 billion in resources supporting innovative companies at every stage of their life cycle, through both direct and indirect investments (including funds of funds).
- Gruppo Duferco – **Strategic Industrial Partner**: Duferco is an international holding company, owned by the Gozzi family, operating in the energy, steel and integrated logistics sectors. Duferco's stake brings not only capital, but also the entrepreneurial experience of an international Group active across diversified businesses, combining industrial expertise and commercial capabilities to deliver innovative and sustainable solutions in the markets in which it operates. Through this involvement, the Duferco Group once again demonstrates its commitment to continuing to invest in new technologies and innovative services to support the competitiveness of local areas and businesses.
- Eni Next **– Corporate Venture Capital**: Eni's corporate venture capital company, investing in startups that develop innovative technologies to reduce the carbon footprint of energy production, improve the efficiency of Eni's industrial operations, and deliver cutting-edge digital solutions. Eni Next brings to Generative Bionics the know-how of a global energy player and access to operational settings where robotics can enhance the safety and efficiency of operations. This partnership serves as a bridge between the global energy industry and next-generation robotic technologies, combining industrial and technological strength with frontier innovation.
- RoboIT **– Co-Investor & National Robotics Fund:** Italy's first National Technology Transfer Hub for Robotics and Industrial Automation, launched by CDP Venture Capital in collaboration with Pariter Partners and developed together with the Istituto Italiano di Tecnologia (IIT) in Genoa, with the involvement of the University of Naples Federico II, the University of Verona and the Sant'Anna School of Advanced Studies in Pisa. Its aim is to foster the creation of a new generation of companies—deep-tech startups emerging from research centres and universities—and to support researchers in

building the future national and international champions of innovation. RoboIT supports the entire technology transfer pipeline that brings innovative technologies to market, starting with the development of proof-of-concepts (PoCs). It provides a structured de-risking and technology transfer pathway covering technical and business feasibility assessment, definition of a technology development plan, and the incorporation of startups. It further boosts projects through entrepreneurial upskilling and market validation, all the way to industrialisation and, ultimately, national and international commercialisation—supported by sector-focused venture capital funds capable of backing the growth of the most promising startups in global markets.

- Tether **– Fintech Investor:** Tether Investments is the independent investment arm of Tether, the largest company in the digital assets industry. Based in El Salvador, the firm deploys capital from Tether's profits and excess reserves across a wide range of sectors where technology, infrastructure, and real-world utility intersect. Its portfolio includes investments in artificial intelligence, financial services, energy, biotechnology, education, and digital media, as well as strategic stakes in industries such as commodities, remittances, and sports and entertainment. Tether Investments supports ventures with long-term potential to improve access, efficiency, and resilience in both emerging and developed markets. Its work supports Tether Group's broader mission to strengthen decentralized systems, promote infrastructure resilience, and expand real-world access to open, transparent technologies.

The initial round totals **€70 million**. Together, these investors provide the capital depth, sector reach, and technology partnerships to execute an ambitious vision - an alliance of public and private, traditional industry and frontier innovation - to help build a **European leader** in humanoid robotics.

Building Capacity and Early Programs

A significant share of the €70M will scale **production capacity**. The first in-house assembly facility will convert lab prototypes into **pre-industrial series**, paving the way to larger volumes.

Funds will also support **product–market fit** via pilot projects with industrial partners to ensure each solution meets real operational needs.

Among the most significant initiatives are the **first agreements for industrial deployment** of Generative Bionics' humanoid robots, which will be announced in the early months of 2026. These deployments mark the transition from experimentation to real-world operations in complex production environments, representing a concrete step toward collaborative automation capable of improving safety, continuity, and performance in high-intensity settings.

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