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# Marcelo Caballero

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## Aspiring AI Product Manager | Robotics

Senior leader with 10+ years of experience delivering AI, robotics and IoT products and managing CHF 100M program portfolios. Led strategic product development for the Thermomix kitchen robot ecosystem with 10M connected devices and more than 100k guided recipes, including multi-robot cooking concepts and embodied systems. Combines an MSc in Artificial Intelligence focused on embodied intelligence, robot morphologies and sensor integration with hands-on experience in defining customer-centric use cases and translating them into clear, execution-ready roadmaps and technical requirements. Experienced in creating connected IoT product and service portfolios, aligning research with market needs, integrating perception-to-action data flows into prototyping cycles and leading cross-functional teams from ideation to commercial launch.

### CORE COMPETENCIES

**AI Product Strategy & Robotics:** Expertise in AI architectures, sensor integration, and embodied AI, translating advanced technical concepts into actionable product roadmaps

**End-to-End AI Lifecycle Management:** Comprehensive understanding from requirements definition and data pipelines to model design, training, deployment, and iterative user-driven improvements

**Cross-Functional Technical Leadership:** Ability to lead agile, multidisciplinary teams (engineering, UX, compliance) through ambiguous scenarios, delivering products in regulated environments

**Rapid Prototyping & Technical Communication:** Skilled at prototyping ML solutions and communicating complex technical insights to stakeholders, facilitating informed decisions and adoption

### PROFESSIONAL EXPERIENCE

#### Independent AI Product & Research Work • Zürich and remote • 11/2024 – present

- Completed an MSc AI thesis on LLM limitations and defended it in Oct 2024. Extended the results into diagnostics for model reliability and evaluation, supporting Responsible AI adoption.
- Built tool-orchestration agent prototypes with experts using Python, Docker, and n8n to demonstrate end-to-end integration of assistant workflows, data pipelines, and inference services.
- Engaged with ETH Zurich, LAC Lucerne, and open-source communities to share applied research and provide reviews and feedback on conversational AI and evaluation.

#### V-Zug AG • Zug, Switzerland • 03/2022 – 05/2024

Digital Product Manager / AI Solutions Architect

- Launched AI-powered subscription services for 500k connected devices, translating complex data pipelines into user-facing applications, collaborating with engineering, UX, and compliance teams
- Initiated ML initiatives leveraging device and spare-part data, clearly defining technical feasibility and product constraints
- Coordinated roadmap priorities directly with engineering teams, ensuring technical readiness and alignment for future AI and ML expansions
- Implemented SAFe methodologies, reducing product time-to-market by 50%

#### Vorwerk International • Wollerau, Switzerland • 03/2016 – 04/2021

Senior Product Manager – connected Products (IoT/AI)

- Owned strategic product roadmaps for complementary connected kitchen devices for [TM6](#), including robotic cooking scenarios, shaping early-stage planning and product evolution for [TM7](#)
- Delivered IoT-enabled kitchen innovations (e.g., [smart thermometer](#), [smart pan](#)) internationally (UK, ES, US, AU), increasing customer interactions by 20%.
- Directed cross-functional teams across hardware, embedded software, cloud, and UX engineering, managing CHF 100M+ programs using agile methodologies.

- Spearheaded “Thermomix as a Service,” integrating IoT hardware, personalized content, and subscription models into a GDPR-compliant platform.
- Filed patent for Multidevice Cooking, establishing a foundational platform for multi-robot coordinated cooking experiences.

## EARLIER PROFESSIONAL EXPERIENCE

### Enterprise-Scale Product & Technology Transformation

**Lufthansa Systems** (2002–2006) — Senior Consultant, ICT Strategy

Advised C-level executives and led IT transformation programs for regulated aviation environments, delivering compliance-aligned digital infrastructure and enterprise technology roadmaps.

**Detecon (Switzerland)** (2011–2013) — Senior Consultant, Enterprise Architecture

Designed and implemented enterprise architecture and digital transformation strategies for federal and enterprise clients, aligning IT modernization with governance and risk frameworks.

### Digital Innovation, New Market Development & IoT Enablement

**Swisscom** (2008–2011) — New Business Development Manager

Launched digital service initiatives in telecom, growing vertical markets and building strategic partnerships; contributed to M&A due diligence for online business expansion.

**Schaerer AG** (2014–2015) — Business Development & Product Management Consultant

Defined IoT platform requirements and feasibility for predictive maintenance and remote diagnostics in connected commercial appliances.

**Startup Incubator @McKinsey** (2001–2002) — Business Consultant

Developed go-to-market strategies and market analysis for mobile commerce innovations, advising telecom clients on positioning and opportunity evaluation.

### Technical Foundation and Early Career Engineering Roles

**Cisco Systems** (2000–2001) — Consulting Engineer

Provided enterprise solution architecture and wrote business cases for campus-mobile IP telephony

**Siemens AG** (1996–2000) — Strategy & Product Management Consultant

Completed Siemens Graduate Program, building business cases for 3G/UMTS and Powerline technologies; presented strategic rollout plans to telecom executives across Europe.

## KEY AI PROJECTS & RESEARCH

### On Artificial General Intelligence (Thesis Research)

- Modeled advanced embodied AI architectures and robotic morphologies, integrating LeCun’s AMI theory for practical robot scenarios
- Developed risk frameworks emphasizing alignment, controllability, and ethical safeguards in autonomous agents

### LLM Architecture & Interaction Research

- Critiqued prompt engineering’s reliability by exposing structural divergences in tokenization, architecture, and scaling, showing prompt variability as an inherent model limitation
- Argued for integrating user interaction constraints into model architecture and tokenizer design upfront, shifting promptability from a fragile post-hoc task to a built-in system capability

### Industrial AI: Manufacturing Intelligence ([GIT Sample Project](#))

- Built ML pipelines to detect rare pattern anomalies, improving quality control accuracy by 20%
- Deployed predictive maintenance models using IoT data to optimize downtime and service intervals

### Computer Vision: Identity Verification System

- Designed CNN-based pipelines (ResNet50V2, MobileNetV2, NASNetLarge) for identity validation
- Applied transfer learning and callbacks to optimize accuracy under resource constraints

## NLP for Large-Scale Text Analysis

- Processed 7.5GB corpus for token frequency analytics and semantic pattern extraction
- Prototyped Python pipelines for efficient document processing and transaction record analysis

## EDUCATION

**MSc in Artificial Intelligence**, Aalen University, Germany (2021–2024)

- Graduated with top honors (1.3). Thesis: "On Artificial General Intelligence" (graded 1.0), focusing on AGI architectures, interpretability, and safe alignment strategies.

**MBA in Entrepreneurship**, IE Business School, Spain (2006–2007)

- Specialized in technology innovation, product strategy, and new business creation.

**B.Sc. in Industrial Engineering and Management**

(Diplom Wirtschaftsingenieur), Wedel University of Applied Sciences, Germany (1994–1996)

- Focus on operations management, R&D process integration, and scalable product development.

**B.Sc. in Computer Engineering**

(Diplom-Ingenieur Technische Informatik) Hamburg Univ. of Applied Sciences, Germany (1988–1993)

- Specialized in software engineering, algorithm design, and foundational computing principles.

## PROFESSIONAL DEVELOPMENT

**IoT and Digital Ecosystems – CAS**, Lucerne University of Applied Sciences and Arts (HSLU), 2021

- Explored IoT frameworks, ML-based services, and cross-functional ecosystem orchestration.

**Artificial Intelligence: Implications for Business Strategy**, MIT, 2018

- Focused on aligning AI technologies with strategic priorities and stakeholder needs.

**Tackling the Challenges of Big Data**, MIT, 2015

- Trained in data pipeline design, real-time analytics, and enterprise-scale data infrastructure.

**Project Management Certification (PMP)**, ZHAW, 2015

- Covered agile product delivery, stakeholder communication, and risk-based prioritization.

**Building New Businesses in Established Companies**, Harvard Business School (HBS), 2010

- Studied innovation, product launch strategies, and market development in mature organizations.

## FURTHER SKILLS

**Technical Stack:** Python (TensorFlow, PyTorch, ROS), Docker, Git, containerized ML workflows, analytics dashboards, API integration

**Product & Delivery:** Agile (Scrum, SAFe), strategic roadmapping, cross-functional leadership, enterprise pilots, stakeholder alignment, KPI tracking, PRD ownership

**AI & Data:** Prompt engineering, LLM prototyping, ML feature design, statistical modeling, data visualization, model evaluation concepts

**Tools & Platforms:** Jira, Confluence, Salesforce, Looker Studio, Grafana, Miro, VS Code, basic cloud service use (GCP, Azure, AWS)

**Languages:** English (C1), German (C2), Spanish (C2)

## WHAT SETS ME APART

My profile is shaped by three elements that are directly relevant for robotics teams. First, MSc level work on embodied intelligence and robot learning, which gives a precise vocabulary for perception, control and morphology topics. Second, responsibility for connected products in the field, including the Thermomix kitchen robot with 10M devices where reliability, updates and service are part of daily operation. Third, a strategy and transformation background that links robotics roadmaps to budgets, risk and measurable outcomes.

Reference decks: (1) [ML: Neural Network for 3D shape detection](#), (2) [AI Swiss Post](#), (3) [J&J E&PS Digitale Transformation](#), (4) [AI Security for LLMs](#), (5) [Swiss Re: GenAI Underwriting Assistant](#), (6) [Next-Gen Legal AI Platform](#)

# ON ARTIFICIAL GENERAL INTELLIGENCE (AGI):

DEFINING INTELLIGENCE, EXPLORING ARCHITECTURES, AND ADDRESSING  
CORE CHALLENGES FROM EMBODIMENT THROUGH BRAIN-INSPIRED  
SYSTEMS, OVER OPEN VS. CLOSED APPROACHES, TO SOCIETAL IMPACTS

## MASTER THESIS

in the study program

**Master of Science Artificial Intelligence**

at Graduate Campus University Aalen

Name: Marcelo Caballero  
Matriculation Nr: 85674  
First Assessor: Prof. Dr. Sigurd Schacht  
Second Assessor: Prof. Dr.-Ing. Carsten Lanquillon  
Date: 15<sup>th</sup> of **October 2024**

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