Raphael Silveira e Silva

Belo Horizonte, Brazil | Available for Relocation | Visa Sponsorship Required  
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# Professional Summary

# Hands-on Senior Mechanical Design Supervisor with 15+ years leading complex industrial automation and special-purpose machinery projects. Proven expertise in managing design teams, driving innovation from concept to production, and delivering high-precision, long-life systems fully compliant with international safety standards (NR-12, OSHA, GMP). Skilled in advanced CAD software (SolidWorks, Catia V6, Siemens NX), motion control integration, PLC/HMI programming, and electromechanical system design. Passionate about turning bold ideas into reliable machines through a structured, collaborative, and hands-on leadership approach. Available for relocation to the U.S. with visa sponsorship.

# Key Skills & Areas of Expertise

* **Mechanical Design Leadership:** Heading Design Teams, R&D, Concept Creation, Project Ownership (End-to-End), Cross-functional Team Leadership, Mentorship, **Workload Prioritization & Planning, Structured & Collaborative Approach.**
* **Automation & Special Purpose Machinery:** Production Line Revamping, Capacity Increase, High-Productivity Assembly, Custom Equipment Design, Packaging Systems, **Bespoke, High-Precision Systems.**
* **CAD/CAE & Design Tools:** SolidWorks (Advanced), Inventor, Siemens NX, AutoCAD, Fusion 360, Catia, FEA (SolidWorks), 3DS MAX, Tolerancing, GD&T, DFM/DFA.
* **Motion Control & Electromechanical Systems:** Precision Motion, Actuation Components, PLC/HMI Programming (Siemens TIA Portal), Microcontroller Programming (Arduino, Raspberry Pi), PID Control, Sensor & Actuator Integration, **Mechanical System Sizing.**
* **Compliance & Quality:** **CE Marking, GMP Principles, Safety Integration, Design Documentation,** NR-12/OSHA Equivalent Compliance, Quality Assurance, Continuous Improvement.
* **Prototyping & Fabrication:** Rapid Prototyping (3D Printing - FDM/SLA), CNC Machining, Sheet Metal Design & Bending, Welding, System Assembly & Bring-up, Field Commissioning.
* **Project Management & Systems:** **Product Data Management (PDM) Systems,** Time and Task Prioritisation, Resource Planning, Risk Management, Stakeholder Engagement.

# Professional Experience

**SIMA Projetos e Soluções Industriais – Belo Horizonte, Brazil**

*Co-Founder & Engineering Manager* | 2016 – Present

* **Led mechanical engineering and systems integration** for complex industrial projects involving automation, UV-C disinfection, and special-purpose machinery, driving innovation from R&D to final product.
* **Directed the full lifecycle of capital projects:** requirements gathering, design, fabrication, installation, commissioning, and post-deployment support, ensuring high-performance and long-life systems.
* Designed modular, operator-safe equipment fully compliant with NR-12 and U.S. OSHA standards, demonstrating strong **compliance expertise**.
* Spearheaded development of IoT-enabled autonomous disinfection robots and fixed UV-C systems, deployed in hospital, pharmaceutical, and public infrastructure environments.
* **Oversaw equipment startup and operator training** across multiple facilities, ensuring smooth transitions.
* Managed third-party contractors and suppliers for custom part fabrication and system integration.
* Introduced design improvements that enhanced maintainability, safety, and component interchangeability, reducing downtime and scrap.

**Highlighted Automation & Machine Build Projects:**

**Punch-Cutting System for Citroën C3 XTR Bumper**

* + *Challenge:* Design a precision punch-cutting machine for mounting holes in large, externally visible plastic bumpers, requiring **flawless surface finish, exact positioning, and high repeatability**.
  + *My Contribution:* Led the full **mechanical design using CATIA and Siemens NX**, collaborating closely with the design studio to translate Class-A surfaces into manufacturable geometry. Engineered punch-and-die tools actuated by hydraulic cylinders, with pneumatic positioning systems. Integrated light curtains and sensors for operator safety. The solution was approved, installed on the PSA production line, and adapted for other models, demonstrating my ability to deliver **high-precision, repeatable systems** from concept to production.

**Autonomous UVC Disinfection Robot**

* + *Challenge:* Develop a fully autonomous robotic system for pathogen disinfection in critical environments, requiring a solution that was both effective and safe for remote operation.
  + *My Contribution:* As **development leader**, I owned the project from concept to commissioning. I personally designed the complete mechatronic system, integrating an Omron AMR platform with custom sensor arrays (LIDAR, vision) and Arduino-based controls. Handled 3D modeling, weight distribution analysis, and initial firmware programming for sensor and safety system integration, ensuring **CE/GMP relevant safety interlocks**.

**UV Curing System for Metal Printing (CMP Project)**

* + *Challenge:* Create a high-performance UV curing system for an industrial metal printing line that required **precise, real-time control over multiple physical parameters** and safety compliance.
  + *My Contribution:* Architected and built the entire electromechanical control system from the ground up. Executed full mechanical design in SolidWorks and electrical schematics in EPLAN. Personally programmed the Siemens PLC and HMI from scratch, developing robust control logic including custom PID loops for precise LED temperature management, hydraulic flow control, and variable current control—all fully compliant with NR-12 safety standards.

**Compact UV Curing System for Offset Press (Astergraf Project)**

* + *Challenge:* Integrate a powerful UV curing system into a high-speed offset printing press (packaging sector), a task made incredibly difficult by an **extremely constrained physical space** and the requirement to operate within a **2mm tolerance of fast-moving machine components**.
  + *My Contribution:* Engineered a solution from first principles. Used **3D printing to rapidly prototype and test several iterations** of a custom, ultra-compact, water-cooled LED module housing. Designed and fabricated bespoke hydraulic connections. This **hands-on iteration and custom fabrication** was key to delivering a functional system that solved a critical production bottleneck.

**AC Implementos Rodoviários – Contagem, Brazil**

*Mechanical Project Manager* | 2014 – 2016

* Directed the design of mechanical subsystems for trailers and road equipment, including hydraulic, locking, and suspension systems.
* Optimized parts for manufacturability (DFM) and reduced costs through component standardization.
* Coordinated with suppliers and internal teams during prototype testing and full-scale production.

**Fourmec Industrial – Belo Horizonte, Brazil**

*Mechanical Design & Managing Partner* | 2008 – 2014

* Led the design and manufacturing of custom machinery for clients in food processing, packaging, and logistics.
* Applied advanced modeling techniques for sheet metal, structures, and product enclosures.
* Developed automated platforms compatible with ABB/Fanuc robots and integrated pneumatic and hydraulic components to deliver turnkey solutions.
* Managed mechanical and electrical teams, delivered turnkey solutions including installation and staff training.

### Personal Projects & Passion for Design

My passion for building extends beyond my professional work. I frequently apply engineering principles to create custom solutions from scratch, moving from concept sketch to CAD and final fabrication in my own workshop. This aligns with the company's philosophy of turning bold ideas into reliable machines.

* **Custom Montessori Bed:** Designed a unique cloud-shaped Montessori bed in Inventor, created detailed fabrication drawings in AutoCAD, and personally built it to meet a specific vision that was unavailable on the market.
* **Walk-in Toy House:** Engineered and constructed a custom walk-in toy house for my niece, managing the project from initial design to final assembly.
* **Therapeutic Game for Social Project:** Modeled a therapeutic game in Autodesk Inventor, detailed laser-cut components in AutoCAD, and sliced the models for 3D printing to support a university social project for the elderly and individuals with learning difficulties.

# Education

**Bachelor of Science in Mechanical Engineering**

Centro Universitário de Belo Horizonte (UNIBH), Brazil – 2021

# Certifications

**NR-12 Machinery Safety Certification**

Certified in Brazilian industrial safety standard (Comparable to OSHA standards – Emphasizes safe machine design, guarding, ergonomics, and operator training).

**Basic Python Programming**

Acquired foundational skills in Python for engineering applications, including scripting, logic, and basic automation tasks.

# Languages

**Portuguese:** Native | **English:** Fluent | **Spanish:** Working Proficiency

# Work Eligibility

Brazilian citizen | Requires sponsorship | Available for immediate relocation