



Miguel A. Salazar de Troya

Head of Software Engineering | Scientific Computing | Optimization

Lausanne, Switzerland | miguel@migueloptimization.com | migueloptimization.com

Profile

Engineering leader with experience building and scaling multidisciplinary teams, developing complex technical platforms, and delivering software-driven physical products. Combines people leadership with deep expertise in scientific computing, simulation, optimization, and high-performance computing. Proven ability to establish effective engineering practices, improve technical performance, translate emerging technologies into production-ready capabilities, and deliver measurable value to customers.

Core Strengths

Engineering Leadership	Technical Strategy	Scientific Computing	Optimization Platforms
Team Building and Hiring	Python and C++	HPC and FEM	Cross-Functional Delivery

Experience

Corintis SA | Head of Software Engineering

Lausanne, Switzerland | *March 2022 – Present*

- Joined as employee #2 and the company's first software engineer, progressing into engineering leadership as the startup grew to more than 100 employees and reporting directly to the CEO.
- Built and led a multidisciplinary team of approximately 15 people across software engineering, computational simulation and optimization, and UI/UX, with nine direct reports currently.
- Personally hired 12 engineers, established the team's recruitment process, defined its structure and responsibilities, and mentored engineers into senior and leadership roles.
- Architected the company's first proprietary topology-optimization platform for microfluidic chip cooling, delivering a prototype within one month and production-ready software within six months using a scalable Python/C finite-element stack.
- Led a redesign of the optimization algorithm that reduced design-generation time from as long as one month to less than one day, improving throughput by approximately 30x.
- Scaled the platform into a company-wide capability used across more than 30 customer projects, addressing a technical need for which no comparable commercial solution existed.
- Established software development practices across the engineering team, including code review, automated testing, CI/CD, documentation, release processes, and Kanban-based delivery.
- Led the team that delivered optimized cooling solutions for three strategic semiconductor customers, including a global hyperscaler, achieving approximately 20% better cooling performance than competing solutions while meeting project timelines.
- Initiated cross-functional collaboration with mechanical engineering, manufacturing, and testing teams to translate computational designs into manufacturable and experimentally validated cooling devices.

- Took on product management responsibilities for the engineering platform, gathering user feedback, defining requirements and priorities, and developing a roadmap that evolved an internal technology into a repeatable company capability.
- Contributed to company strategy, annual planning, and OKR definition; represented engineering in leadership discussions and supported technical due diligence with customers and external partners.

Lawrence Livermore National Laboratory | Postdoctoral Researcher

Livermore, CA | *May 2019 – March 2022*

- Developed a Python library for topology optimization based on level-set methods.
- Built design workflows for heat exchangers and supercapacitors, combining modeling, optimization, and post-processing.
- Created a Flask and Signac web application for analysis and review of optimization results.
- Validated supercapacitor models against experiments and mentored an intern supporting that work.
- Trained colleagues entering topology optimization and defined software guidance for future internal tools.

Lawrence Livermore National Laboratory | Research Assistant

Livermore, CA | *September 2015 – April 2019*

- Developed a large-scale topology optimization framework for solid mechanics in C++.
- Implemented adaptive mesh refinement and mesh-independent optimization methods for PDE-constrained problems.
- Contributed to build, testing, and CI workflows with CMake and Bamboo.
- Supported simulation and experimental validation for an electrophoretic deposition flow cell.

ExxonMobil | Computational Scientist

Houston, TX | *May 2015 – August 2015*

- Performed numerical simulations of turbidity-current velocity profiles.
- Implemented a $k-\epsilon$ turbulence model for Reynolds-averaged Navier-Stokes equations.

University of Illinois Urbana-Champaign | Research Assistant

Champaign, IL | *May 2012 – May 2015*

- Developed optimization methods for material design focused on energy-wave management.
- Implemented an adaptive discrete-adjoint Runge-Kutta method in C++.

Education

University of Illinois Urbana-Champaign | PhD and MS in Mechanical Engineering

Champaign, IL | *January 2011 – May 2019*

- GPA: 3.89
- PhD thesis: Adaptive mesh refinement for topology optimization

- MS thesis: Optimization of granular materials for energy-wave management

University of Granada | Bachelor, Civil Engineering
Granada, Spain | *October 2004 – December 2010*

Selected Recognition and Research

Awards	Livermore Graduate Scholar; TALENTIA Fellowship
Scientific Service	Reviewer for <i>Structural and Multidisciplinary Optimization</i> and <i>Computer Methods in Applied Mechanics and Engineering</i> ; organizer of SIAM CSE minisymposia on shape and topology optimization
Selected Publications	Publications in <i>Carbon</i> , <i>Optimization Methods and Software</i> , <i>Materials & Design</i> , and <i>Structural and Multidisciplinary Optimization</i>