

# Manuel Solalinde

*Software Developer - MSc. Applied Mathematics - Data Scientist*

[Email](#) / [CV](#) / [LinkedIn](#) / [Github1](#) / [Github2](#) / [Stackoverflow](#) / [Website](#)



## Work Experience

**Senior Software Engineer** - [BKV Corporation](#) - May 2022 - present

- Designed and developed machine learning applications for optimization of **artificial lift systems**.
- Built web applications for real-time visualization, analysis, and processing of gas wells data, to facilitate insightful data interpretation and decision-making for engineers and managers.
- Significantly enhanced the efficiency of existing **data processing algorithms**, achieving over 10x improvement in performance. This set of optimizations led to significant increase in the usage of related applications.
- Developed templates and libraries, streamlining the process of creating new applications and reusing existing components.
- Architected and implemented AWS Infrastructure Solutions. Development of robust libraries and templates for seamless deployment of infrastructure into AWS, leveraging advanced **infrastructure as code** techniques with pulumi.
- Technologies: Python, Javascript, Fastapi, React, Azure AD, Plotly, Redux, Postgres SQL, AWS Cloud Computing Services, Nodejs, HTML/CSS. Testing: Cypress, Jest (frontend), Pytest (backend).
- Data Science libraries: scikit-learn, pandas, numpy, plotly, tensorflow, keras, streamlit.

**Senior Software Engineer** - [BairesDev](#) - May 2022 - present

- Involved in development of web applications and data science projects at BKV Corporation, focusing on creating intuitive surveillance dashboards and engineering tools.
- My role includes analyzing and interpreting extensive datasets, employing advanced methods to extract actionable insights

## **Software Developer** - Self Employed / Independent Contractor - Jul 2017 - Jul 2022

- Full Stack Developer for Centralhub Search Engine Platform. A search engine platform based on web scraping automation of regional e-commerce sites.  
[Web Site](#)
- Developer of a tool for converting dual fisheye camera videos to equirectangular stitched videos using NVIDIA CUDA, NVDEC, NVENC.
- Developer of a management system using Excel VBA and SQL.
- Backend developer of ecommerce sites.
- Worked in a cross-functional, agile team to rebuild the SPR system for the Paraguayan National Secretary of Planning.
- Assistance with information architecture and UX writing for webapps.

## **Software Developer - Engineer** - [IMPISA](#) - Mendoza, Argentina - Jan 2011 - Jul 2013

- Lead Developer of the ARTUR platform (C++ Language), used for the calculation and pre-dimensioning of hydraulic turbine structural component elements.
- Assisted in the development of design manuals that set the criteria for calculation and dimensioning of water turbine structural elements.



## **Projects**

### **General Oil and Gas Applications** - [BKV Corporation](#)

Set of applications for optimization of artificial lift systems.

- *Applications:*
  - Plunger Optimizations plots, analysis, and reports.
  - Gas Injection Estimator.
  - CO2 Injection runtime history app.
  - Well communication tool.
  - LLM application for the detection of punch holes in tubing and casing.
  - Reservoir Pressure Propagation calculator.
- *Technologies:* Python, Streamlit, pandas, numpy, scikit-learn, plotly, tensorflow, keras.

### **Gas Targets Application** - [BKV Corporation](#)

Web application used to evaluate and set gas production targets for gas wells.

Allow users to review state of wells and run parallel tasks to process data and store results in a database.

- *Role:* Software Development Engineer
- *Duration:* april 2022 to present
- *Responsabilities:*
  - Frontend development (React, Bootstrap, Redux, Plotly.js, jest)
  - Backend development and testing (Python, Fastapi, Postgres, SQL, pytest)

- AWS Cloud Infrastructure architecture and implementation, using infrastructure as code framework (pulumi, AWS, SQS, Lambda, RDS, App Runner).
  - Lambda functions for parallel data processing and data storage.
  - CI/CD pipeline implementation (Github Actions).
- *Technologies:* Python, Javascript, Fastapi, React, Azure AD (Corporate authentication), Plotly, Redux, Postgres SQL, AWS Cloud Computing Services, HTML/CSS. Testing: Pytest (backend).

## **Surveillance Dashboard Application** - [project details](#)

A set of web applications to visualize, analyze and process real time data from gas wells. Drastically improves performance over custom Power BI applications that serve similar purposes. Comprised of 3 sub applications: Single well, Multi well, Daily and Engineering Plots.

- *Role:* Software Development Engineer
- *Duration:* april 2022 to present
- *Responsibilities:*
  - Frontend development and testing (React, Bootstrap, Redux, Plotly.js, Mapbox, jest)
  - Backend development and testing (Python, Fastapi, Postgres, SQL, pytest, Docker)
  - AWS Cloud Infrastructure architecture and implementation, using infrastructure as code framework (pulumi, AWS, Lambda, RDS, App Runner, S3, VPC, Route 53).
  - Lambda functions for cron jobs.
  - CI/CD pipeline implementation (Github Actions).
- *Key Features:* - Azure AD authentication. - Support user comments on time series data. - Automatic data resampling for time series data. - Selection and filter of wells from lists or maps. - Multi well selection and data comparison. - Can add smoothing and indicators to time series data.
- *Technologies:* Python, Javascript, Fastapi, React, Azure AD (Corporate authentication), Plotly, Redux, Postgres SQL, AWS Cloud Computing Services, HTML/CSS. Testing: Cypress, Jest (frontend), Pytest (backend).

## Centralhub Search Engine - [project details](#)

A search engine platform based on web scraping of local e-commerce sites.

- *Role:* Full Stack Developer
- *Description:* A search engine platform based on web scraping automation of regional e-commerce sites. Consists of 5 sub-projects: 1. An E-commerce Search Engine Frontend, 2. E-commerce Search Engine Admin Backend, 3. Web scraping API core and tools, 4. Web scraping automation and synchronization tools, 5. Devops, Search Engine Implementation, Architecture, and Integrations.
- **Technologies used:** Elasticsearch, Python, Flask, Docker, NoSQL, Scrapy, Selenium, Firebase (Functions, Firestore, Authentication, Hosting), Git, JavaScript, React, Redux, Nodejs, Google Cloud Platform (PubSub, Task Scheduler, Compute Engine, Cloud Run, Task Runner, Logging). Testing: Jest, Pytest.

## Dual Fisheye to VR180 - Nvidia GPU Video Stitcher - [project details](#)

A tool for converting dual fisheye camera videos to equirectangular stitched videos using NVIDIA CUDA, NVDEC, NVENC.

- *Role:* Developer
- Results obtained were x100+ faster than those obtained using serial CPU programming.
- **Technologies used:** C++, Cmake, CUDA, OpenGL, OpenCV, Nvidia VRWorks.

## Artur Platform - Predimensioning of hydraulic turbine structural components - [project details](#)

A tool for predimensioning of hydraulic turbine structural components.

- Lead developer for the ARTUR platform, used for the calculation and pre-dimensioning of hydraulic turbine structural component elements.
- Assisted in the development of design manuals that set the criteria for calculation and dimensioning of water turbine structural elements.
- *Employer:* [IMPISA](#) - [Juan De Miguel](#)
- **Technologies used:** C++, ANSYS Multiphysics API, Matlab, Excel VBA, SolidEdge API.

## Enertrag WindEnergy-Hydrogen-Biogas Integrated System Simulation Tool - [project details](#)

A tool for simulation of wind energy systems using hydrogen and biogas.

- Developed in coordination with the Hochschule Stralsund as a base tool for simulations in the field of Wind Power - Hydrogen integrated systems for the [ENERTRAG](#) company.
- *Employer:* [Hochschule Stralsund](#) - [Prof. Dr. rer. nat. Jochen Lehmann](#) - [Prof. Dr.-Ing. Thomas Luschtinetz](#)
- **Technologies used:** Matlab, Matlab Genetic Algorithms Toolbox.

## SPR System - Technical Secretary of Planning - Paraguayan Government - [project details](#)

Design specifications and UI/UX for the [SPR system](#) - Technical Secretary of Planning - Paraguayan Government ([STP](#)).

- Worked in a cross-functional, agile team to rebuild the [SPR system](#)
- Assistance with information architecture and UX writing for the web app
- *Client:* [STP-Paraguay](#)

## StuffILearned - Personal Software development Notes - [project details](#)

A software development personal blog to keep track of new technologies, courses and personal notes. **To be replaced soon.**

- Provide easy access to common software development notes.
- *Website:* <http://181.126.83.235/>
- **Technologies used:** PHP, Wordpress, MySQL, html, css.

## Matchmaking - [project details](#)

A simple flask web application to balance team players for video games.

- Small open source project.
- *Github:* <https://github.com/manolosolalinde/matchmaking>
- **Technologies used:** Python, Flask, MySQL, SQLAlchemy, Jinja, Bootstrap, html, css.

## A Finite Element Based Level Set Approach for the Simulation of Two-Phased Flows - [short summary](#)

A Finite Element Based Level Set Approach for the Simulation of Two-Phased Flows.

- *Description:* **Master Thesis.** Level set approach for the simulation of two-phase immiscible newtonian fluids.
- *Github:* <https://github.com/manolosolalinde/FEM-Multiphase>
- *Dissertation:*  
[http://www.ppgem.eng.uerj.br/trabalhosconclusao/2011/2011dissdoc\\_nestor\\_solalinde.pdf](http://www.ppgem.eng.uerj.br/trabalhosconclusao/2011/2011dissdoc_nestor_solalinde.pdf)
- **Technologies used:** C++, Matlab, Wolfram Mathematica, Libmesh Finite Elements Library.



## EDUCATION

### MSc. in Mechanical Engineering – Applied Mathematics

[UERJ](#) - Rio de Janeiro, Brazil (2009-2011)

- Finished with straight A's.
- *Specialization:* Scientific computing, continuum mechanics, finite elements, optimization, fluid mechanics, heat transfer.
- *Master Thesis:* A finite element level-set approach for the simulation of two-phased flows.  
[http://www.ppgem.eng.uerj.br/trabalhosconclusao/2011/2011dissdoc\\_nestor\\_solalinde.pdf](http://www.ppgem.eng.uerj.br/trabalhosconclusao/2011/2011dissdoc_nestor_solalinde.pdf)

### Electromechanical Engineer

[Universidad Nacional de Asunción](#) - Asunción, Paraguay (2001-2008)

- Finished as a member of the honor roll (top 5 students).
- Initial enrollment test: rank 3 of 120 students admitted. (800 applicants).
- Auxiliary Teacher of Vector Mechanics (third semester subject).
- Course concluded with an average grade of 4.23 in a scale from 1 to 5, 5 being the highest grade.
- *Thesis:* Analysis of Electrolytic Hydrogen Production in Paraguay.

### International Exchange Semester

[Hochschule Stralsund](#) - Stralsund, Germany (2007)

- Finished a 6 months course on Renewable Energies and Hydrogen Technology, top of the class, with an average of 1.27 in a scale from 1 to 5, 1 being the highest grade.

## High School

[San Ignacio de Loyola School](#) - Asuncion, Paraguay (1995-2000)

- Private High School.
- General average grade in secondary education: 4.26 on a scale from 1 to 5, 5 being the highest grade.

## Languages

**English:** Fluent

**Portuguese:** Advanced

**German:** Intermediate

**Spanish:** Native

## Informal Software Engineering Education

### Build a Backend REST API with Python & Django - Advanced

- Udemy - [Course details](#)
- Course duration: 8hs. Online Course.

### Complete Guide to Elasticsearch

- Udemy - [Course details](#)
- Course duration: 12hs. Online Course.

### Intro to Parallel Programming

- Coursera – Udacity - [Course details](#)
- Course duration: 21hs. Online Course.

### Machine Learning

- Coursera – Stanford University - [Course details](#)
- Course duration: 55hs. Online Course.

### CS50's Web Programming with Python and JavaScript

- edX – Harvard University - [Course details](#)
- Course duration: 90hs. Online Course.

### HTML, CSS, and Javascript for Web Developers

- Coursera – Johns Hopkins University - [Course details](#)
- Course duration: 33hs. Online Course.

### Computer Vision Intro™ OpenCV4 in Python with Deep Learning

- Udemy - [Course details](#)
- Course duration: 10hs. Online Course.

### Convolutional Neural Networks for Visual Recognition

- Stanford University - [Course details](#)
- Course duration: 34hs. Online Course.

### **Complete Guide to TensorFlow for Deep Learning with Python**

- Udemy - [Course details](#)
- Course duration: 14hs. Online Course.

### **OCW 6001 Introduction to Computer Science and Programming in Python**

- MIT OCW - [Course details](#)
- Course duration: 12hs. Online Course.

### **C++**

- TheChernoProject/Youtube - [Course details](#)
- Duration: 15hs. Online Course.

## **Introduction Courses**

Most of these were used as technology introduction material before diving into deeper documentation.

**GraphQL** - The Net Ninja - [Course details](#)

**Gatsby Tutorial** - The Net Ninja - Youtube - [Course details](#)

**Next.JS** - The Net Ninja - Youtube - [Course details](#)

**React Native** - The Net Ninja - [Course details](#)

**Javascript Unit Testing with Jest** - Traversy Media - [Course details](#)

**React, Redux & Firebase** - The Net Ninja - [Course details](#)

**Python REST API** - Tech With Tim - [Course details](#)

**Asynchronous Python** - Live Python - [Course details](#)

**React Redux** - The Net Ninja - [Course details](#)

**Firebase Firestore** - The Net Ninja - [Course details](#)

**Docker** - freeCodeCamp.org - [Course details](#)

**Docker Compose** - Jake Wright - [Course details](#)



## **Electromechanical Engineering experience**

### **Self-Employed / Consultant**

January 2017 to current date

- Asuncion – Paraguay (January 2017 to current date)
- Calculation and assessment of structural components using finite element analysis tools for: - Naval industry (tugboats, barges). - Cement Industry (mills, structural components). - Shipyards.
- Design and calculation of hydraulic systems (industrial plants).
- Design and calculation of general steel structures.



- Electrical, HVAC and Plumbing projects.

### **Engineer / Manager @ [SCE S.A.](#) Asuncion – Paraguay (2016-2017)**

- Engineering and Design: Design and calculation of steel structures.
- Electrical, HVAC and Plumbing projects for houses, several story buildings and residential complex.
- Management: Construction of a residential complex of 1800m2. Development of excel/SQL tools for management.

### **Engineer @ [TECNOEDIL S.A.](#)**

Asuncion – Paraguay (2013-2015)

- BIM Management and Implementation with Revit Architecture and Revit MEP for the Engineering technical office.
- Coordination of all the task related electrical systems, HVAC, Fire protection and Plumbing, related to the construction of the Regional Hospital of Ciudad del Este. Client: IPS.

### **Engineer/Developer @ [IMPISA](#)**

Mendoza – Argentina (2011 to 2013)

- Lead Developer of the ARTUR platform (C++ Language), used for the calculation and pre-dimensioning of hydraulic turbine structural component elements.
- Assisted in the development of design manuals that set the criteria for calculation and dimensioning of water turbine structural elements.

### **Engineering Intern @ [TERMECO S.R.L.](#)**

Asuncion- Paraguay (Apr/2007-Jul/2007)

- Intern. Mechanical Designer, drawer.
- *Tasks:* Industrial Boilers design using Solidworks, Bioethanol Plant Project related design tasks.

### **Mechanical Designer @ [TEDEC S.R.L.](#)**

Asuncion – Paraguay (Nov/2005-Aug/2006)

- Tasks related to electrical installations design, tanks and vessels design and piping design for several industries such as a Stevia Processing Plant, a Shipyard and an alcohol dispensing station.
- I made a very successful presentation, using 3D modeling tools, of a Stevia Processing Plant project that led to the approval of the Plant Construction.

**Technical Drawer** @ [CORSAT S.R.L.](#)

Asuncion – Paraguay (Jan/2005-Jul/2005)

- Calculus and 3D design of a waste dryer for meat industry; several engineering related jobs.

## **Mechanical Engineering Certifications**

**ASHRAE HVAC Design: Level I & Level II** - [Details](#)

December, 2016 - ASHRAE Headquarters, Atlanta, GA, EEUU

**Revit Architecture 2014 Certified Professional** - [Details](#)

Autodesk University 2013 – Las Vegas Nevada

## **On The Side**

**Organizer** @ Energy and Environment Workshop (2009)

UNA University Campus, Asuncion, Paraguay.