

FRANCO BROWN

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EXPERIENCE

Research assistant, UCSC

03/2020 - 03/2022

- Automatization of geotechnical simulation's workflows using python scripting speeding up the model setups by +30%.
- Development of a model for shallow foundation capacity under combined load 35% faster than the usual method and 96% accurate compared to simulation values using pipelines for ANN models with sklearn, scikeras and tensorflow.
- Managed a project to improve and consolidate simplified finite element simulations; restructuring the workflow and cutting down calibrations by 30% using machine learning models.
- Developed and implemented an efficient element test and optimization algorithm in Python, resulting in a 50% reduction in calibration workflow time, exceeding industry standards.
- Managed a project to simulate shallow and deep foundations subjected to static and dynamic loads under drained and undrained conditions.
- Development of an advanced mathematical model to represent shallow foundations reducing the computational time of finite elements analysis for soil-structure interaction by an impressive 70%.
- Design and implementation of a +40% faster method for selection of excavation's support systems based in previous data, and pipelines for deep learning and logistic regression models for classification.
- Development of a slope's support systems classification algorithm, designing ANN pipelines with sklearn and tensorflow, resulting in a +40% faster estimation method maintaining the accuracy of industry softwares.
- Implementation of a modification of hypoplastic model with anisotropic fabric 30% more accurate than the normal formulation using one more state variable.

Assistant professor, UCSC

03/2020 - 12/2021

- Improved students grades by 15% using Ipad notes and recording classes in Geotechnical Engineering and Foundations courses.

Internship, Soenco Ltda

12/2019 - 03/2020

- Implementation of a classification model that selects the optimal support systems +20% faster than usual calculation methods and 10% cheaper in cost, using machine learning techniques, tensorflow and scipy.
- Elaboration of a back analysis algorithm that automatizes the parameter estimation, making the calibration process at least 35% faster.

Teaching assistant, UCSC

08/2018 - 08/2019

- Managed to increase the course grades by 12% using advanced physical models to explain topics in Rock mechanics and Underground Excavations courses.

EDUCATION

Universidad Católica de la Santísima Concepción *03/2020 - 08/2023*
Msc in Civil Engineering Grade: 6.73/7.00 with the highest distinction
Thesis project: Development of a coupled macroelement for foundations under monotonic and cyclic loads.

Universidad Católica de la Santísima Concepción *03/2014 - 08/2023*
Engineering degree in Geological Engineering Grade: 5.60/7.00 with two votes of distinction
Relevant courses: Finite elements, Statistics, Sensitivity analysis.

Universidad Católica de la Santísima Concepción *03/2014 - 08/2018*
Bachelor degree in Engineering

SKILLS

Programming Languages and Frameworks
Fortran, Python, SQL, noSQL, mySQL, Azure, AWS, Matlab, Latex, Microsoft Office Suite, Power BI, AutoCAD and GiD.

Python Packages
Sklearn, Numpy, Scipy, Tensorflow, Seaborn, Matplotlib, Pandas.

Geotechnical softwares
Plaxis, Anura3D, Geoslope and Rocscience Suite.

Languages
Spanish (native), Advanced English (Fluent)

AWARDS AND SCHOLARSHIPS

Postgraduate program scholarship, Universidad Católica de la Santísima Concepción *03/2020*
Full scholarship awarded to be a part of the program "master's degree in civil engineering".

PUBLICATIONS UNDER REVIEW

A coupled hypoplastic-plastic macroelement model for shallow foundations under cyclic loading, Main Author. *Acta Geotechnica*

ACTIVITIES

Basketball player, Universidad Católica de la Santísima Concepción *03/2014 - 03/2016*
Guard, with playmaker abilities and great court vision. This skills transfer directly into my engineer work.