

Guilherme Castelhão

castelao@ucsd.edu | www.castelao.net

PROFILE

A physical oceanographer and offshore sailor with experience developing data pipelines.

I code novel solutions to explore my scientific interests, which often result in Open Source packages with industry standards. I also enjoy mentoring and teaching best practices in scientific computing to scientists.

EDUCATION

RSMAS - UNIV. OF MIAMI

PH.D. PHYSICAL OCEANOGRAPHY

2011 | Miami, FL

Eddies in the oceans

IOUSP - UNIV. OF SÃO PAULO

M.Sc. PHYSICAL OCEANOGRAPHY

2002 | São Paulo, Brazil

Air-sea heat fluxes

UNIV. OF RIO GRANDE

BS IN COASTAL MANAGEMENT

BS IN RENEWABLE RESOURCES

2000 | Rio Grande, Brazil

Air-sea interaction

CERTIFICATIONS &

AWARDS

- 2019 Certified Carpentries Instructor Trainer
- 2018 Small boats Operator - Scripps
- 2017 Certified Carpentries Instructor
- 2011 Startup selected by Pinboard Investment
- 2011 JGR's highlighted paper

COMMITTEES

- OceanGliders Data Management
- CF-Conventions
- IQuOD (co-chair)
- GTSP
- QARTOD 5-year plan

LINKS

Github:// [castelao](#)

LinkedIn:// [Guilherme Castelhão](#)

Twitter:// [@SamplingGUI](#)

Google Scholar:// [G.P. Castelhão](#)

EXPERIENCE

SCRIPPS INST. OF OCEANOGRAPHY | MACHINE LEARNING SCIENTIST

2023 - present | Hybrid - La Jolla, CA

Physics-informed neural networks (Python, TensorFlow, MITgcm, Rust, Ansible, Airflow)

SCOOT SCIENCE | DATA SCIENTIST / DATA ENGINEER

2022 | Remote

Training personnel and mentoring; Strategic framework refactoring to improve software maintenance and CI/CD (ETL, Github Actions, Python, AWS, Agile, Asana).

SCRIPPS INST. OF OCEANOGRAPHY | ASSOC. ACADEMIC SPECIALIST-II

2017 - 2022 | La Jolla, CA

- International committees on data standards and procedures (CF, glider RTQC, ...)
- Real-time data pipeline including health monitoring of underwater gliders, data archiving and dissemination (Python, PostgreSQL, AWS, REST API, Git, Ansible, ...)
- Novel methodology to calibrate chlorophyll fluorescence from underwater gliders using remote sensing chlorophyll (Parallelization, Bayes stat., Pandas/Xarray ...)
- Automatic Quality Control procedures using Machine Learning (Python)
- Iridium SBD server - Satellite communication for Argo and Spray (Rust)
- Iridium RUDICS server & protocol - BGC-Argo communications (Rust)

AOML - NOAA | LEADING SYSTEM DEVELOPER & DATABASE MANAGER

2006 - 2008 | Miami, FL

Real-time and delayed mode data pipeline with automatic quality control for NOAA's TSG operations. Flexible parsing for heterogeneous data acquisition, and transmission to GTS as BUFR. (PostgreSQL, PL/pgSQL, Python, SVN, ...)

RESEARCH

SCRIPPS INST. OF OCEANOGRAPHY | POSTDOCTORAL SCHOLAR

2016 - 2017 | La Jolla, CA

Migrated the Spray underwater glider dataset to netCDF-CF for data dissemination. Created a cloud infrastructure (mostly AWS) for IDG in a wide range of services including data visualization, dynamic websites, databases, dedicated email server, dedicated ERDDAP server, and others, managed with Ansible.

OC. INST. OF THE UNIV. OF SÃO PAULO | POSTDOCTORAL SCHOLAR

2013 - 2015 | Brazil

Study on the impact of mesoscale eddies on the sea surface heat fluxes; Machine learning technique to QC oceanographic data; Ran GFDL climate model on HPC.

NATIONAL INST. FOR SPACE RESEARCH (INPE) | RESEARCHER

2011 - 2012 | Brazil

Developed quality control system and Climate Earth System Model (FORTRAN, HPC).

LATEST WORK

Complete list on Google Scholar.

- [1] **Castelhão, G. P.** A machine learning approach to automatic quality control of oceanographic data. *Computers & Geosciences*, 155:104803, 2021.
- [2] **Castelhão, G. P.** and L. C. Irber Jr. TEOS-10 Gibbs sea water toolbox in Rust for microcontrollers. *Journal of Open Source Software*, submitted.
- [3] **Castelhão, G. P.** and D. L. Rudnick. A climatology of chlorophyll fluorescence from Spray underwater gliders in the California Current region. *in prep.*