Francesco Brandolin

+966565942463 (SA) / +393703604808 (IT) | f.brandolin3@gmail.com | Nationality: Italy | github.com/FB-I | linkedin.com/in/francesco-brandolin-73724a199/

PhD Candidate: developing machine learning solutions for upstream oil and gas applications

- Researcher in Geophysics with hands-on experience in Machine Learning, Computer Vision, Physics-Informed ML, and Generative ML, focused on upstream energy challenges and deployment of deep learning models in industrial R&D contexts.
- Contributing to the industry-sponsored DeepWave Research Consortium at KAUST (Saudi Arabia).
- Committed to translating cutting-edge AI technologies into practical solutions for the energy sector.

Research Experience in ML and scientific computing

Saudi Aramco EXPEC ARC, *Advanced Imaging solutions Lab Intern* *(Saudi Arabia) Ongoing-Aug 2025*

- Developing AI seismic imaging solutions for oil and gas exploration.

King Abdullah University of Science and Technology, *Graduate Researcher Intern* *(Saudi Arabia) Sept 2021 - Dec 2021*

- Developed an Unsupervised Learning physics-based algorithm for seismic image de-aliasing.
- Technical report accepted to the IMAGE 2022, Houston (USA) annual conference.

ENI, *Seismic Imaging and ML Intern* *(Italy) Sept 2020 - Dec 2020*

- Developed a Generative AI (Deep Image Prior) application for seismic imaging inverse problems.
- The project later resulting winner of the prestigious Italian Award in the Energy sector: **Gustavo Sclocchi Award (2022)**

Trieste University, *Undergraduate Researcher* *(Italy) June 2018 - Dec 2018*

- Developed a computational model to simulate satellite gravimetric sensor sensitivity.
- Italian Space Agency (ASI) funded MOCAST+ satellite project
- Contributor to the submitted technical abstract at the 27th IUGG General Assembly, Montreal, Canada.

Skills

Technical skills

- *Programming & Scripting:* Python (advanced), Bash & Shell Scripting, MATLAB, R, Git (version control)
- *Machine Learning & AI Frameworks:* PyTorch (advanced), TensorFlow, JAX, Hugging Face.
- *Applied ML in Energy:* Physics-Informed ML, Generative Models, Predictive Modeling, Anomaly Detection, Optimization under Uncertainty
- *Software Engineering & Reproducibility:* Python package development, reproducible workflows, model versioning, collaborative ML pipelines

Soft skills

Growth Mindset, Strategic Thinking & Problem Framing, Stakeholder Communication, Technical Storytelling, Interpersonal & Cross-functional Collaboration, Adaptive Thinking

Education

PhD, Solid Earth Geophysics and Machine Learning *January 2022- (exp. grad. 2025)*
King Abdullah University of Science and Technology (KAUST), Saudi Arabia

MS, Geophysics *June 2021*
Trieste University, Trieste, Italy | 110/110 cum Laude

BSc, Geosciences-Geophysics *December 2018*
Trieste University, Trieste, Italy | 109/110

Certifications

- **Nordic Probabilistic AI School** (Nordic ProbAI) - Copenaghen (DK) 2024
- **Data Assimilation** with application in Reservoir Engineering, Atmospheric Science, Risk and Safety - Cluj (ROM) 2023
- **Tsinghua Shenzhen International Graduate School** (SIGS), Ocean Engineering Summer school - Shenzhen (CN) 2024
- **Future Leaders Accelerator Program** (COACHOLOGY), Mindset, Communication, Emotional Intelligence -KAUST (SA),2024

Selected Publications

- F. Brandolin, M. Ravasi, and T. Alkhalifah, (2024), "PINNslope: seismic data interpolation and local slope estimation with physics informed neural networks," *GEOPHYSICS* 89: V331-V345.
- F. Brandolin, M. Ravasi, and T. Alkhalifah, (2025), "Slope assisted Physics Informed Neural Networks for seismic signal separation with applications on ground roll removal and interpolation" *Geophysical Prospecting* 73 (5), 1337-1363.
- Brandolin F., Ravasi M., Alkhalifah T., 2023, Physics informed neural network slope prediction and interpolation with positional encoding", Third International Meeting for Applied Geoscience & Energy. SEG/AAPG, Expanded Abstracts, 2023, pp. 1520-1524
- Brandolin F., Ravasi M., Alkhalifah T., 2022, PWDPINN: Slope-assisted seismic interpolation with physics-informed neural networks, Second International Meeting for Applied Geoscience & Energy. SEG/AAPG, Expanded Abstracts, 2022, pp. 2646–2650.

Honors and Awards

2022 **First Prize - 29th Gustavo Sclocchi Award - Master Thesis and PhD**, Issued by SPE, EAGE, Assorisorse *Italy*
2023 **Applied Geophysics Degree Award "Arianna Mocnik"**, Issued by Trieste University, Esplora Srl *Italy*