

# Abdullah Adnan Alali

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## EXPERIENCE

### SLB, KSA

#### **Research Engineer (Intern)**

2023

Developed machine learning model to enhance dielectric inversion in extreme conditions.

### Saudi Aramco, KSA

#### **Machine Learning Engineer (Intern)**

2021

Developed machine learning models to invert rock properties, namely acoustic impedance,  $V_p/V_s$  and density from field seismic data.

### King Abdullah University of Science and Technology (KAUST), KSA

#### **Full-waveform Inversion (FWI) Teaching Assistant (TA)**

2022

Prepared assignments and provided hands-on tutorials on practical aspects in implementing FWI.

#### **Seismic Imaging Teaching Assistant (TA)**

2020

Assisted students to better understand the material along with grading their assignments and exams.

## EDUCATION

### King Abdullah University of Science and Technology (KAUST)

#### **Ph.D. Earth Science & Engineering (Machine Learning Track)**

2018-2023

Dissertation title: *Advances of deep learning in geophysical challenges: 4D seismic processing and salt inversion.*

Advisor: Tariq Alkhalifah.

Relevant Courses: Seismic Inversion, Computational Geophysics, Machine learning.

#### **M.S. Earth Science & Engineering**

2018

Thesis title: *Seismic Imaging and Velocity Analysis Using a Pseudo Inverse to the Extended Born Approximation.*

Advisor: Tariq Alkhalifah.

Relevant Courses: Seismology, Seismic Imaging, Inverse Problem, Data analysis in geoscience.

### King Fahd University of Petroleum and Mineral (KFUPM)

#### **B.S. Geophysics**

2016

Relevant Courses: Seismic Exploration I, Seismic Exploration II, Seismic Processing, Potential Field Methods.

### Colorado School of Mines

#### **International Exchange Program**

2014

Relevant Courses: Sedimentology and Stratigraphy, Well Logging.

## PROJECTS

- **Salt Body Reconstruction** 2022  
Integrate machine learning with full-waveform inversion to reconstruct salt velocity models.
- **Carbon Storage Monitoring** 2020  
Applied neural network models to process 4D seismic data to monitor carbon storage in the subsurface.
- **Imaging and Velocity Analysis** 2018  
Implemented an approximate inverse formula for imaging and analyze it in a heterogeneous medium.  
Applied an automated velocity analysis to obtain an accurate velocity model for imaging.

## JOURNAL PUBLICATIONS

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- Integrating U-nets into a Multi-scale Waveform Inversion for Salt Body Building, *IEEE Transactions on Geoscience and Remote Sensing*, (Submitted) 2023
  - Deep learning unfloding for robust subsalt waveform inversion, *Geophysical Prospecting*. 2022
  - Time-lapse data matching using a recurrent neural network approach, *Geophysics*. 2022
  - Seismic velocity modeling in the digital transformation era: a review of the role of machine learning, *Journal of Petroleum Exploration and Production*. 2021
  - The effectiveness of a pseudo-inverse extended born operator to handle lateral heterogeneity for imaging and velocity analysis applications, *Geophysical Prospecting*. 2020

## PARTICIPATIONS

- 
- EAGE/SEG Annual Meeting** 2018-2022
    - Presented posters/oral presentations and attended workshops in the technical program.
    - Reviewed abstracts for the acceptance process and chaired technical sessions.
  - SEG Machine Learning Workshop For Geoscience, Oman** 2020,2021
    - Presented an oral presentation and attended presentations for three days.
  - KAUST-Nvidia Workshop On Accelerating Scientific Application Using GPU** 2019,2020,2022
    - Hands-on in deep learning, multi-GPU, and model parallelism workshops.

## VOLUNTEER EXPERIENCE

- 
- Physical Science and Engineering (PSE) Student Senate** 2022
    - Represented the Earth Science department in the PSE division at KAUST to work directly with the PSE dean and contribute to improving the PSE academic experience.
  - Workshop Assistant** 2022
    - Assisted in “entrepreneurs in greens” workshop at the *Inaugural Annual Saudi Youth Sustainability Conference*.
  - Mentor** 2021
    - Led a team in the *Industry Emerging Challenges Mentorship program* organized by DGS to solve a geoscience challenge using artificial intelligent tools.
  - Teaching Assistant** 2021
    - Assisted in hands-on tutorials on word embedding, active learning, and transformers as part of *KAUST-Iraya unstructured data in geoscience summer school*.

## CERTIFICATES & AWARDS

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- The best in show award in the 83<sup>rd</sup> EAGE annual meeting explainable artificial intelligent hackathon. 2022
  - The dean’s award for outstanding students in the Earth science program at KAUST. 2022
  - Certificate in "Fundamentals of deep learning for multi-GPUs" from NVIDIA. 2021
  - The 1<sup>st</sup> place award in KAUST GPU hackathon for accelerating scientific application. 2020
  - The winner award for a reading competition about machine learning in geoscience organized by DGS. 2020
  - Certificate in "Fundamentals of deep learning for computer vision" from NVIDIA. 2019
  - The 1<sup>st</sup> place in the SEG/DGS challenge bowl in the middle east and 2<sup>nd</sup> place in the final round held in the SEG annual meeting in Anaheim, California. 2018

## PROGRAMING

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- Languages:** C/C++, Python, Matlab.
  - Parallel programming:** OpenMP, MPI, Slurm, and worked on **Shaheen 2.0 (KAUST supercomputer)**
  - Machine learning:** Tensorflow and Pytorch
  - Distributed learning:** Horovod and DeepSpeed