Abdullah Adnan Alali

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EXPERIENCE

Saudi Aramco, KSA

Machine Learning Engineer *2021*

Developed machine learning models to invert rock properties, specifically acoustic impedance, Vp/Vs 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 *2018-2023*

Dissertation title: *Advances of deep learning in solving challenging geophysical problems: 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 Inversion** *2019-Present*
  Integrate machine learning with full-waveform inversion to reconstruct salt velocity models.
- **Carbon Storage Monitoring** *2019-Present*
  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

- Integrating U-nets into a Multi-scale Waveform Inversion for Salt Body Building, *IEEE Transactions on Geoscience and Remote Sensing*, (Submitted) *2023*
- Deep learning unflooding 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*

- Hands-on deep learning workshop with presentations on different GPU applications.

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 intellegent 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

- The best in show award in the 83rd 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 1st 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 1st place in the SEG/DGS challenge bowl in the middle east and 2nd place in the final round held in the SEG annual meeting in Anaheim, California. *2018*
- The 3rd place student-poster presentation award as part of GEO conference in Bahrain. *2018*

PROGRAMING

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