



MEWBOURNE COLLEGE OF EARTH AND ENERGY
**ATTRIBUTE-ASSISTED SEISMIC
PROCESSING & INTERPRETATION**
The UNIVERSITY of OKLAHOMA

August 2024

Hello AASPI sponsors & supporters!

I hope you all had a wonderful summer! The Fall semester starts in just a few days at OU, making it the time of the year for our mid-year update.

For those of you that are sponsors - we have **the new version of AASPI for Windows** ready for you at the following link: <https://mcee.ou.edu/aaspi/software>

Also, a reminder that our **annual meeting will be held on OU's campus January 9-10, 2025**. I'll be reaching out in November with more details, and for RSVPs.

This month, we are welcoming six new graduate students at OU, and two new visiting scholars, so this fall will be busy for us setting up new projects to benefit AASPI projects. Students will be working on a myriad of topics that I mentioned at the last annual meeting such as adding in more well log and rock physics tools, as well as synthetic models that can be used to test ML and attribute results.

Some of the updates since earlier this spring:

- Fixed issue with aberrancy not initializing. Also, updated the default aberrancy operator.
- Fixed issue with spec_cmp not working properly when the output data was larger than the input data volume.
- Updated convolutional model. Now, it accepts user-defined wavelets.
- Fixed issue with amplitude spectrum computation. Algorithm is now faster and works with VDS format.
- Updated extract_training_samples for CNN. Now, AASPI can create 3D cubes of any size to use as training for CNN.

Currently, in terms of debugging, we are working on:

- Unet: There is an issue with the loss function. Not working correctly for unbalanced data.
- Select datapath for VDS files: Currently, VDS files are saved to the same directory AASPI is working on. However, on Linux users might select a different datapath. In the meantime, if the user needs to select another datapath for your files on Linux, please use the .H AASPI format.

We are also continuing to work on our chatbot, with plans to hire another student to help us prepare the training data.

As always - all the updates, publications, dissertations and help manual can be found on our website: <https://ou.edu/mcee/labs/aaspi> And if you can't find what you are looking for - please email us at aaspi@ou.edu.

AASPI @ IMAGE

Below is a list of all the AASPI related presentations at IMAGE. We hope to see you there!

Tuesday - August 27th

AP P1: State of Play 1 – Poster Station 7 (3rd Level)

8:00 a.m. – 9:40 a.m. Enhancing seismic delineation of obscured geologic architectural elements in a deepwater channel complex through multi-attribute analysis: A study from the Taranaki Basin. - April D. Moreno-Ward, Heather Bedle, Alexandro Vera-Arroyo

INT 1: Machine Learning in Assisting Facies Analysis Room 362A

9:15 a.m. Application of vector plots, LIME, and SHAP for seismic facies machine learning evaluation - Heather Bedle, David Lubo-Robles

INT P1: Machine Learning in Assisting Geological Interpretation - Poster Station 5 (Exhibit Hall)

10:20 a.m. – 12:00 p.m. - Seismic impedance inversion via neural networks and linear optimization algorithm - Bo Zhang, Yitao Pu, Ruiqi Dai, Danping Cao

NA P4: Gulf of Mexico: Seismic and Modeling - Poster Station 6 (3rd Level)

1:20 p.m. – 3:00 p.m. Investigating the Phenomenon of Disappearing Channels Using Machine Learning and Seismic Attributes: An example from the Mississippi and De Soto Valleys in the Gulf of Mexico - Issa Al Aamri, Heather Bedle, Alexandro Vera-Arroyo

NA 8: US Gulf of Mexico: Offshore Field Studies - Room 361B

4:30 p.m. Elucidating Quaternary high-frequency depositional sequences and incised valley evolution using high-resolution 3D seismic data: Northwestern Gulf of Mexico, USA - Jacob D. Maag, Heather Bedle

Wednesday - August 28th

DMLA 3: Reservoir Modeling 2 - Room 351A

8:00 a.m. Machine learning-based seismic facies analysis for deep water sediments characterization - Tural Feyzullayev, David Lubo-Robles, Beatriz Benjumea, Heather Bedle, et. al.

NA P7: Geological Studies focused in the Midcontinent 3 - Poster Station 3 (3rd Level) G

10:20 a.m. - 12:00 p.m. It is not our fault... yet; a multiattribute and swarm intelligence analysis for upper basement region for fault identification in Decatur, Illinois - Hy Tran, Heather Bedle,

David Lubo-Robles, Alexandro Vera-Arroyo

INT P7: Interpretation Methods - Poster Station 5 (Exhibit Hall)

1:20 p.m. – 3:00 p.m. Applications of iso-frequency structure-oriented filtering to machine learning-based fault classification - Jie Qi, Tom Smith, Kurt Marfurt²

Thursday - August 29th

SP P20: Seismic Data Interpolation and Regularization 4 - Poster Station 5 (3rd Level)

10:20 a.m. – 12:00 p.m. Post-migration seismic data conditioning through merged datasets: enhancing accuracy and insight - Pamela V. Blanco Dufau, Heather Bedle, Kurt Marfurt

TL P4: Improvements in Time-Lapse Analysis 2 - Poster Station 4 (3rd Level)

10:20 a.m. - 12:00 Insights into fluid movement and production discrepancies from PCA clustering on 4D seismic data - Evan Jowers, Heather Bedle

Thank you so much for your AASPI support!

-Heather