

Supplemental Materials

Martin, T. P., Meyer, R., & Jobe, Z. (2021). Centimeter-Scale Lithology and Facies Prediction in Cored Wells using Machine Learning. *Frontiers in Earth Science*, 9, 491.

10.1 Research Code Hosted on Github

All code and available data associated with this work is freely available under a MIT license at <https://github.com/rgmyr/coremdl>. Installation instructions and dependencies are on the github website. Some data will need to be directly downloaded from the UK Oil and Gas Authority website.

10.2 Processed Image Data

Processed core columns of images using the Meyer et al., (2020) workflow for each well are available for future research as zipped folder as numpy (.npz) arrays on the github and on the Figshare repository [<https://doi.org/10.6084/m9.figshare.14265689.v1>].

10.3 Results and Prediction Data

All 32 pixel (~0.5cm) scale interpretations, predictions, probabilities and data are stored in comma separated variable ASCII files (.csv's). Each training well run for one data type will be on one .csv file. This will also include a smaller results .csv that will be a summary. This will be available on the github.

10.4 Training Sets for Lithology:

| | |
|------------------|--------------------------------|
| 3 Training Wells | |
| 0 | 204-24a-7, 204-24a-6, 204-20-3 |
| 1 | 204-19-3A, 204-19-7, 205-21b-3 |
| 2 | 204-20-1, 204-20-2, 204-19-6 |
| 3 | 204-19-6, 204-20-1Z, 204-20a-7 |
| 4 | 204-20-6a, 204-20-1, 204-19-6 |
| | |
| 6 Training Wells | |

| | |
|------------------|---|
| 0 | 204-24a-7, 204-24a-6, 204-20-3, 204-20-6a, 204-20a-7, 204-19-6 |
| 1 | 204-19-3A, 204-20-1, 204-19-7, 205-21b-3, 204-20-2, 204-20-1Z |
| 2 | 204-20-3, 204-20-1, 204-19-7, 205-21b-3, 204-20-6a, 204-20a-7 |
| 3 | 204-19-6, 204-20-1Z, 204-24a-6, 204-24a-7, 204-20-2, 204-20-6a |
| 4 | 204-19-3A, 204-20-1, 204-20-3, 204-20a-7, 205-21b-3, 204-19-7 |
| | |
| 9 Training Wells | |
| 0 | 204-19-3A, 204-20-1, 204-19-7, 205-21b-3, 204-20-6a, 204-20a-7, 204-20-2, 204-19-6, 204-20-1Z |
| 1 | 204-24a-7, 204-24a-6, 204-19-3A, 204-19-7, 205-21b-3, 204-20-6a, 204-20a-7, 204-20-3, 204-20-1Z |
| 2 | 204-24a-7, 204-24a-6, 204-20-3, 204-20-1, 204-20-6a, 204-20a-7, 204-20-2, 204-19-6, 204-20-1Z |
| 3 | 204-19-7, 204-20-2, 204-20a-7, 205-21b-3, 204-20-1, 204-19-3A, 204-19-6, 204-24a-7, 204-20-6a |
| 4 | 204-24a-6, 204-20-6a, 204-20-3, 204-19-6, 204-20-2, 204-19-7, 204-24a-7, 204-20-1Z, 204-21b-3 |

10.5 Computer Specifications

The work presented in this study was processed on a desktop computer using Linux operating system (Pop!_OS), made by System 76 in Denver, Colorado. It has a 4.3 GHz Processor with 10 cores, 128GB of DDR4 Ram and an 11GB RTX 2080Ti video card. Retail price on this NVIDIA graphics card at time of publication range in price from 1,500-2000 dollars USD and total price for a comparable complete desktop is ~4500 USD.