

# Néstor Cardozo

---

## CONTACT INFORMATION

Dept. of Energy Resources  
KE E-394  
University of Stavanger  
4036 Stavanger, Norway

*Telephone:* Work: (47) 51 83 23 91, Mobile: (47) 40 62 95 62  
*E-mail:* [nestor.cardozo@uis.no](mailto:nestor.cardozo@uis.no)  
web page: <https://www.ux.uis.no/~nestor/home.html>  
Github: <https://github.com/nfed>

## RESEARCH INTERESTS

Structural Geology and Basin Analysis. Numerical modelling and computation applied to Geosciences.

## EDUCATION

**Cornell University**, Ithaca, New York USA **January 1998 - January 2003**

Ph.D. Earth and Atmospheric Sciences, January 2003

- Dissertation: Mechanical and kinematic investigations of fault propagation folding and fore-land subsidence
- Advisors: Richard Allmendinger and Teresa Jordan

**Ohio University**, Athens, Ohio USA **September 1995 - September 1997**

M.S., Geological Sciences, September, 1997

- Thesis: Thermomechanical modeling of the Llanos Basin, Colombia
- Advisor: Douglas Green

**Universidad Nacional**, Bogotá Colombia **September 1994 - September 1995**

Coursework M.S., Geotechnical Engineering, September 1994 - September 1995

**Universidad Nacional**, Bogotá Colombia **September 1988 - June 1994**

B.S., Geology, September, 1994

- Thesis: Structural Analysis of the Soapaga fault, Eastern Cordillera, Colombia
- Advisor: Andreas Kammer

## PROFESSIONAL EXPERIENCE

**Dept. of Energy Resources, University of Stavanger**, Norway

*Professor (since 2017)*

**October, 2008 - present**

Courses taught: Structural Geology (Bachelor and Master), Geotechnical Engineering (Bachelor), Modelling and Computational Engineering (Master), Python for Natural Sciences and Engineering (PhD)

**Center for Integrated Petroleum Research**, Bergen, Norway

*Researcher II*

**September, 2004 - September 2008**

Fault Facies project, an initiative to realistically include faults in reservoir models. More information on this [site](#)

**Norwegian Geotechnical Institute**, Oslo, Norway

*Postdoctoral fellow*

**August, 2003 - August 2004**

Mechanical modeling of fault zones, rockslides, and fractured carbonates

**Department of Earth and Atmospheric Sciences, Cornell University**, Ithaca, New York USA

*Postdoc*

**August, 2002 - August 2003**

Field, kinematic and mechanical studies of fault propagation folding

PhDs

Charlotte Botter: Seismic imaging of fault zones (NFR 210425/E30). Graduated June 2016. Currently Teaching Fellow at the University of Leeds.

Luis Alberto Rojo: Impact of salt movement in the Triassic of the Nordkapp basin, Barents Sea (KD). Graduated October 2020. Currently at Aker-BP.

Jennifer Cunningham: From seismic interpretation to reservoir modelling of faults (KD). Graduated January 2021. Currently at Equinor.

Anaëlle Guillevic: Geothermal energy potential of the Norwegian North Sea (KD). Started November 2022

Daniele Blancone: Salt characterization and modelling for the future energy mix (NCS2030). Started January 2023.

Jake Butcher: Structural Geology and Geomechanics of the Wisting field, Barents Sea. Started May 2023.

POSTDOCS

David Oakley (PhD University of Pennsylvania): Structural uncertainty and stochastic structural modelling (KD). September 2020 to September 2022. Currently postdoc at The University of Edinburgh.

Nisar Ahmed (PhD UiS): Data driven ML methods for reservoir characterization (NCS2030). Started June 2024.

PUBLICATIONS

*Conference abstracts not included*

50. Blancone, D., Ruiz Maraggi, L.M., Cardozo, N., Moscardelli, L. and Escalona, A. 2025. Assessing hydrogen storage potential in Zechstein salt caverns of the Norwegian North Sea. *Journal of Energy Storage* 128, 117032.
49. Butcher, J.H., Cardozo, N., Schulte, L. and Rojo, L. 2025. The low acoustic impedance of fault zones in the Wisting field, Barents Sea: Gas saturation or damage zone? *Journal of Structural Geology* 191, 105347.
48. Castelblanco, C., Vargas, C. and Cardozo, N. 2025. Seismic attenuation in the Middle Magdalena Valley, Colombia, and possible relation to fluid lubricated fault zones. *Journal of South American Earth Sciences* 153, 105359.
47. Schulte, L., Cardozo, N. and Batista, A. 2024. The well log and seismic expression of faults in the Wisting field, Barents Sea. *Journal of Structural Geology* 178, 105036.
46. Cardozo, N. and Hardy, S. 2023. cdem: A macOS program for discrete element modelling of tectonic structures. *Geosphere*, <https://doi.org/10.1130/GES02647.1>.
45. Oakley, D., Cardozo, N., Almendral Vazquez, A. and Røe, P. 2023. Structural geologic modeling and restoration using Ensemble Kalman inversion. *Journal of Structural Geology*, 171, 104868.
44. Marín, D., Cardozo, N. and Escalona, A. 2023. Compositional variation of the Zechstein Group in the Norwegian North Sea: implications for underground storage in salt caverns. *Basin Research*, <https://doi.org/10.1111/bre.12761>.

43. Volatili, T., Agosta, F., Cardozo, N., Zambrano, M., Lecomte, I. and Tondi, E. 2022. Outcrop-scale fracture analysis and seismic modelling of a basin-bounding normal fault in platform carbonates, central Italy. *Journal of Structural Geology* 155, 104515.
42. Cunningham, J., Cardozo, N., Weibull, W. and Iacopini, D. 2021. Investigating the PS seismic imaging of faults using seismic modelling and data from the Snøhvit field, Barents Sea. *Petroleum Geosciences* 28, petgeo2020-044.
41. Hardy, S. and Cardozo, N. 2021. Discrete Element Modelling of Sedimentation and Tectonics: Implications for the growth of thrust faults and thrust wedges in space and time, and the interpretation of syn-tectonic (growth) strata. *Frontiers in Earth Science* 9, 742204.
40. Cunningham, J., Cardozo, N., Townsend, C. and Callow, R. 2021. The Impact of seismic interpretation methods on the analysis of faults: A case study from the Snøhvit field, Barents Sea. *Solid Earth* 12, 741-764.
39. Pachón-Parra, L.F., Mann, P. and Cardozo, N. 2020. Regional subsurface mapping and 3D flexural modeling of the obliquely-converging Putumayo foreland basin, southern Colombia. *Interpretation* 8, 4, ST15-ST48.
38. Mostalenko, A., Khudoley, A. and Cardozo, N. 2020. Fault kinematics and paleostress analysis using seismic data: A case study from the Archinsk field, West Siberian Basin, Russia. *Journal of Structural Geology* 104194.
37. Rojo, L.A., Koyi, H., Cardozo, N. and Escalona, A. 2020. Salt tectonics in salt-bearing rift basins: progradational loading vs. extension. *Journal of Structural Geology* 104193.
36. Mohammadrezaei, H., Alavi, S., Cardozo, N. and Ghassemi, M.R. 2020. Deciphering the relationship between basement faulting and polyphase folding in the Hendijan anticline, Northwestern Persian Gulf, Iran. *Marine and Petroleum Geology* 122, 104626.
35. Rojo, L.A., Marín, D.L., Cardozo, N., Escalona, A., Koyi, H. 2019. The influence of halokinesis on prograding clinoforms: insights from the Tiddlybanken Basin, Norwegian Barents Sea. *Basin Research*, 32, 979-1004.
34. Trede, C., Cardozo, N. and Watson, L. 2019. What is the appropriate size for strike and dip measurements? An evaluation from compass, smartphone, and LiDAR measurements. *Norwegian Journal of Geology* 99, 3, 1-14.
33. Rojo, L.A., Cardozo, N., Escalona, A. and Koyi, H. 2019. Structural style and evolution of the Nordkapp Basin, Norwegian Barents Sea. *AAPG Bulletin* 103, 2177-2217.
32. Cedeño, A., Rojo, L., Cardozo, N., Centeno, L. and Escalona, A. 2019. The impact of salt tectonics on the thermal evolution and the petroleum system of confined rift basins: insights from basin modelling of the Nordkapp Basin, Norwegian Barents Sea. *Geosciences* 9(7), 316.
31. Cardozo, N. and Oakley, D. 2019. Inverse modelling for possible rather than unique solutions. *Journal of Structural Geology* 125, 285-295.
30. Kairanov, B., Marín, D., Escalona, A. and Cardozo, N. 2019. Growth and linkage of a basin-bounding fault system: Insights from the Early Cretaceous evolution of the northern Polhem Subplatform, SW Barents Sea. *Journal of Structural Geology* 124, 182-196.
29. Medina-Cascales, I., Koch, L., Cardozo, N., Martín-Rojas, I., Alfaro, P. and García-Tortosa, F.J. 2019. 3D geometry and architecture of a normal fault zone in poorly lithified sediments: A trench study on a strand of the Baza Fault, central Betic Cordillera, south Spain. *Journal of Structural Geology* 121, 21-45.
28. Cunningham, J., Cardozo, N., Townsend, C., Iacopini, D. and Wærum, G.O. 2019. Deformation, seismic amplitude and unsupervised fault facies analysis of normal faults, Snøhvit field in the Barents Sea, Norway. *Journal of Structural Geology* 118, 165-180.
27. Sydnes, M., Fjeldskaar, W., Ltveit, I., Grunnaleite, I. and Cardozo, N. 2018. The importance of sill thickness and timing of sill emplacement on hydrocarbon maturation. *Marine and Petroleum Geology* 89, 500-514.

26. Guerriero, L., Bertello, L., Cardozo, N., Berti, M., Grelle, G. and Revellino, P. 2017. Unsteady sediment discharge in earth flows: A case study from the Mount Pizzuto earth flow, southern Italy. *Geomorphology* 295, 260-284.
25. Botter, C., Cardozo, N., Tveranger, J., Qu, D. and Kolyukhin, D. 2017. Seismic characterisation of fault facies models. *Interpretation*, 5(4), SP9-SP26.
24. Botter, C., Cardozo, N., Lecomte, I., Rotevatn, A. and Paton, G. 2017. The impact of faults and fluid flow on seismic images of a relay ramp over production time. *Petroleum Geosciences* 23, 17-28.
23. Botter, C., Cardozo, N., Hardy, S., Lecomte, I., Paton, G. and Escalona, A. 2016. Seismic characterisation of fault damage in 3D using mechanical and seismic modelling. *Marine and Petroleum Geology* 77, 973-990.
22. Cardozo, N., Montes, C., Marín, D., Gutierrez, I. and Palencia, A. 2016. Structural analysis of the Tabaco anticline, Cerrejón open-cast coal mine, Colombia, South America. *Journal of Structural Geology* 87, 115-133.
21. Botter, C., Cardozo, N., Hardy, S., Lecomte, I. and Escalona, A. 2014. From mechanical modeling to seismic imaging of faults: A synthetic workflow to study the impact of faults on seismic. *Marine and Petroleum Geology* 57, 187-207.
20. Cardozo, N. and Brandenburg, J.P. 2014. Kinematic modeling of folding above listric propagating thrusts. *Journal of Structural Geology* 60, 1-12.
19. Grothe, P.R., Cardozo, N., Mueller, K. and Ishiyama, T. 2014. Propagation history of the Osaka-wan blind thrust, Japan, from trishear modeling. *Journal of Structural Geology* 58, 79-94.
18. Vidal-Royo, O., Muñoz, J.A., Hardy, S., Koyi, H. and Cardozo, N. 2013. Structural evolution of the Pico del Águila anticline (External Sierras, Southern Pyrenees) derived from sandbox, numerical and 3D structural modelling techniques. *Geologica Acta* 11, 1-26.
17. Cardozo, N. and Allmendinger, R.W. 2013. Spherical projections with OSXStereonet. *Computers and Geosciences* 51, 193-205.
16. [Allmendinger, R. W., Cardozo, N., and Fisher, D. 2012. \*Structural Geology Algorithms: Vectors and Tensors\*. Cambridge University Press.](#)
15. Vidal-Royo, O., Cardozo, N., Muñoz, J., Hardy, S. and Maerten, L. 2012. Multiple mechanisms driving detachment folding as deduced from 3D reconstruction and geomechanical restoration: The Pico del Águila anticline (External Sierras, Southern Pyrenees). *Basin Research* 24, 295-313.
14. Cardozo, N., Jackson, C.A. and Whipp, P. 2011. Determining the uniqueness of best-fit trishear models. *Journal of Structural Geology* 33, 1063-1078.
13. Fachri, M., Tveranger, J., Cardozo, N. and Pettersen, Ø. 2011. The impact of fault envelope structure on fluid flow: A screening study using Fault Facies. In Press. *American Association of Petroleum Geologists Bulletin* 95, 619-648.
12. Braathen, A., Tveranger, J., Fossen, H., Skar, T., Cardozo, N., Semshaug, S.E., Bastesen E. and Sverdrup E. 2009. Fault Facies and its applications to sandstone reservoirs. *American Association of Petroleum Geologists Bulletin* 93, 891-917.
11. Cardozo, N. and Aanonsen, S.I. 2009. Optimized trishear inverse modeling. *Journal of Structural Geology* 31, 546-560.
10. Cardozo, N. and Allmendinger, R.W. 2009. SSPX: A program to compute strain from displacement/velocity data. *Computers and Geosciences* 35, 1343-1357.

9. Fredman, N., Tveranger, J., Cardozo, N., Braathen, A., Soleng, H., Røe, P., Skorstad, A. and Syversveen, A.R. 2008. Fault facies modelling: Technique, and approach for 3D conditioning and modeling of faulted grids. American Association of Petroleum Geologists Bulletin 92, 1457-1478.
8. Cardozo, N., Røe, Per, Soleng, H., Fredman, N. Tveranger, J. and Schueller, S. 2008. A methodology for efficiently populating faulted corner point grids with strain. Petroleum Geoscience 14, 205-220.
7. Cardozo, N. 2008. Trishear in 3D: Algorithms, implementation, and limitations. Journal of Structural Geology 30, 327-340.
6. Cardozo, N., Allmendinger, R.W., Morgan, J.K. 2005. Influence of mechanical stratigraphy and initial stress state on the formation of two fault propagation folds. Journal of Structural Geology, 27, 1954-1972.
5. Cardozo, N. 2005. Trishear modeling of fold bedding data along a topographic profile. Journal of Structural Geology, 27, 495-502.
4. Gómez, E., Jordan, T.E., Allmendinger, R.W., and Cardozo, N. 2005. Development of the Colombian foreland-basin system as a consequence of diachronous exhumation of the northern Andes. Geological Society of America Bulletin, 117, 1272-1292.
3. Cardozo, N., Bhalla, K., Zehnder, A.T., Allmendinger, R.W. 2003. Mechanical models of fault propagation folds and comparison to the Trishear kinematic model. Journal of Structural Geology, 25, 1-18.
2. Cardozo, N., Jordan, T. 2001. Causes of spatially variable tectonic subsidence in the Miocene Bermejo foreland basin, Argentina. Basin Research, 13, 335-357.
1. Jordan, T., Schlunegger, F., and Cardozo, N. 2001. Unsteady and spatially variable evolution of the Neogene Andean Bermejo foreland basin, Argentina. Journal of South American Earth Sciences, 14, 775-798.

#### COMPUTER PROGRAMS

cdem: 2D discrete element modeling of geological structures (with Stuart Hardy, ICREA)  
 Stereonet3D: Stereonet with 3D visualization (with Richard Allmendinger, Cornell University)  
 GeoKalk: Structural geology calculator  
 SSPX: Inverse strain modeling (with Richard Allmendinger, Cornell University)  
 Trishear3D: 3D forward modeling of fault related folds  
 Backstrip: Backstripping of sedimentary rocks  
 Flex2D: 2D flexural modeling

These programs are for macOS and are available on my [website](#) and on the Mac App Store.

#### REPOSITORIES

[Matlab scripts](#) and [Xcode playgrounds](#) for Structural Geology and Basin Analysis available on my website. The Matlab scripts are also available in [this repository](#).

[Computational Geosciences](#): A book on Computational Geosciences with Python code included. I wrote this together with students, and as an educational project funded by the TN faculty.

[Python for Geosciences course](#): A 1 week Python course. This is part of a Python and ML for geosciences course funded by NFIP.

[Structural Geology](#): A collection of Jupyter Notebooks for Structural Geology.

[Energy Plots](#): Animations of the World's energy supply and demand. Data from the Statistical Review of World Energy, and animations made using Python.

[Curso de programación básica Python](#): A course in collaboration with Germn Prieto at the Universidad Nacional de Colombia. In Spanish.

ONLINE LECTURES [Structural Geology YouTube playlist](#): Lectures from my Bachelor Structural Geology Course at the University of Stavanger.