

Mahdi Heidari Moghadam

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Academic Background

- Ph.D. in Geotechnical Engineering, Department of Civil and Environmental Engineering, University of Texas at Austin, 2010 – 2013
- M.Sc. in Earthquake Engineering, Department of Civil and Environmental Engineering, University of Tehran, 2007 – 2010
- M.Sc. in Structural Engineering, Department of Civil and Environmental Engineering, Sharif University of Technology, 2000 – 2006
- B.Sc. in Civil Engineering, University of Tehran, 1996 – 2000

Areas of Expertise

- A. Geomechanics
- B. Pore pressure prediction
- C. Numerical modeling
- D. Constitutive modeling
- E. Engineering geology
- F. Tunneling and underground structures

Professional Work Experience

- A. Research Associate, Bureau of Economic Geology, The University of Texas at Austin (March 2016 - Present).
- B. Postdoctoral Fellow, Bureau of Economic Geology, The University of Texas at Austin (Sep 2013 – March 2016).
- C. Professional Engineer, Hasin Saze, Iran (2000 - 2010).

Professional Societies

American Rock Mechanics Association (ARMA)
American Society of Civil Engineers (ASCE)
Texas Board of Professional Engineers (EIT member)
Iran Board of Professional Engineers (PE member)

Awards and Honorary Societies

Future Leader, American Rock Mechanics Association (ARMA), 2016.
Award for Best Technical Paper, North American Tunneling Conference, Society of Mining, Metallurgy, and Exploration (SME), Indianapolis, June 2012.
Kolodzey Grant Award, The University of Texas at Austin, June 2013.
Recognized as 'Exceptional Talent' by Iranian National Foundation of Elites.

Ranked 20th among ~500,000 participants in national university entrance exam, Iran.

Ranked 17th among ~10,000 participants in national graduate school entrance exam, Iran.

Ranked 11th in national olympiad of civil engineers, Iran.

Committee Responsibilities and Professional Activities

Convener and Editor of a thematic entitled: “Mechanics of salt systems: state of the field in numerical methods”. Petroleum Geoscience, International journal published by Geological Society of London and the European Association of Geoscientists and Engineers (EAGE).

Reviewer, Canadian Geotechnical Journal, International journal published by NRC Research Press

Reviewer, Geotechnical Testing Journal, International journal published by ASTM International

Reviewer, Geophysical Journal International, International journal published by Oxford University Press

Reviewer, Rock Mechanics and Rock Engineering, International journal published by Springer

Reviewer, Tunneling and Underground Space Technology, International journal published by Elsevier

Reviewer, Arabian Journal of Geosciences, International journal published by Springer

Reviewer, Journal of Multidiscipline Modeling in Materials and Structures, International journal published by Emerald

Reviewer, Journal of Geophysics and Engineering, International journal published by IOP

Reviewer, Journal of Mountain Science, International journal published by Springer

Reviewer, Earthquake Engineering & Engineering Vibration, International journal published by Springer

Reviewer, Science China Technological Sciences, International journal published by Springer

Reviewer, 50th U.S. Rock Mechanics/Geomechanics Symposium, Houston, June 26–29, 2016

Reviewer, 49th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, June 28–July 2, 2015

Reviewer, 47th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, June 24–28, 2013

Member, Geo-Institute, ASCE graduate students chapter, 2012

Patents

U.S. patent pending on pore-pressure prediction based on seismic velocities coupled with geomechanical modeling (PCT/US16/18971).

Publications

Peer-Reviewed Journal Articles

Heidari, M., Nikolinakou, M., Hudec, M., Flemings, P., 2018 (under review). Geological and geomechanical impacts of a permeable bed in a salt basin. *Marine and Petroleum Geology*.

Heidari, M., Nikolinakou, M., Flemings, P., 2018 (accepted). Coupling geomechanical modeling with seismic pressure prediction. *Geophysics*.

Gao, B., Flemings, P., Nikolinakou, M., Saffer, D.M., Heidari, M., 2018 (accepted). Mechanics of fold-and-thrust belts based on geomechanical modeling. *Journal of Geophysical Research*.

Nikolinakou, M.A., Heidari, M., Hudec, M.R., Flemings, P.B., 2018. Geomechanical modeling of pore pressure in evolving salt systems. *Marine and Petroleum Geology*, 93: 272-286.

Nikolinakou, M.A., Heidari, M., Hudec, M.R., Flemings, P.B., 2017. Initiation and growth of salt diapirs in tectonically stable settings: Upbuilding and megaflaps. *AAPG Bulletin*, 101: 887-905.

Heidari, M., Nikolinakou, M., Flemings, P., Hudec, M., 2017. A simplified stress analysis of rising salt domes. *Basin Research*, 29: 363–376. doi:10.1111/bre.12181.

Heidari, M., Nikolinakou, M., Hudec, M., Flemings, P., 2016. Geomechanical analysis of a welding salt layer and its effects on adjacent sediments. *Tectonophysics*. doi:

<http://dx.doi.org/10.1016/j.tecto.2016.06.027>

Heidari, M., Tonon, F., 2015. Ground reaction curve for tunnels with jet grouting umbrellas considering jet grouting hardening. *International Journal of Rock Mechanics and Mining Sciences*. 76:200-208 doi:<http://dx.doi.org/10.1016/j.ijrmms.2015.03.021>.

Heidari, M., Vafai, A., Desai, C., 2009. An Eulerian multiplicative constitutive model of finite elastoplasticity. *European Journal of Mechanics-A/Solids*. 28:1088-1097. doi:<http://dx.doi.org/10.1016/j.euromechsol.2009.05.002>.

Peer-Reviewed Conference Articles

Heidari, M., Nikolinakou, M., Flemings, P., Hudec, M., 2018. Enhancing Modified Cam-Clay model for large stress range. ARMA 18-0790, 52nd U.S. Rock Mechanics/Geomechanics Symposium, Seattle, WA, 17-20 June.

Heidari, M., Nikolinakou, M., Hudec, M., Flemings, P., 2017. Geomechanical effects of a highly permeable sand layer in a salt basin. ARMA 17-0881, 51th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA, 25-28 June.

Nikolinakou, M.A., Heidari, M., Flemings, P.B., Hudec, M.R., 2017. Pore-Pressure Prediction Beneath Salt Sheets. ARMA 17-0881, 51th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA, 25-28 June.

Heidari, M., Nikolinakou, M., Hudec, M., Flemings, P., 2016. Geomechanical impacts of a welding salt layer on adjacent sediments. ARMA 16-035, 50th U.S. Rock Mechanics/Geomechanics Symposium, Houston, TX, 26-29 June.

Nikolinakou, M.A., Heidari, M., Flemings, P.B., 2016. Pore-pressure prediction based on seismic velocities coupled with geomechanical modeling. ARMA 16-035, 50th U.S. Rock Mechanics/Geomechanics Symposium, Houston, TX, 26-29 June.

Nikolinakou, M.A., Heidari, M., Flemings, P.B., Hudec, M.R., 2016. Coupling Flow and Deformation in Evolving Salt Basins. *Poromechanics VI*: 295-303.

Heidari, M., Nikolinakou, M., Flemings, P., Hudec, M., 2015. A simplified analysis of stresses in rising salt domes and adjacent sediments. ARMA 15-159, 49th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA, 28 June–2 July.

Nikolinakou, M.A., Heidari, M., Hudec, M.R., Flemings, P.B., 2015. Stress changes associated with the evolution of a salt diapir into a salt sheet. ARMA 15-159, 49th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA, 28 June–2 July.

Heidari, M., 2013. A numerical analysis of wellbores in shale with viscoplastic behavior. ARMA 13-652, 47th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA, 23–26 June.

Heidari, M., 2012. Convergence curve for tunnels with hardening jet grouting using displacement-controlled analysis. **Invited paper**, North American Tunneling (NAT), Indianapolis, June 2012.

Presentations

Invited presentations

Heidari, M., 2017. Integration of geotechnical and geomechanical modeling to predict pressure and stress fields in salt basins. Presented to Geotechnical program at The University of Texas at Austin, Department of Civil and Environmental Engineering. Austin, TX, April 8th.

Heidari, M., 2012. Convergence curve for tunnels with hardening jet grouting using displacement-controlled analysis. North American Tunneling (NAT), Indianapolis, June 2012.

Conference oral presentations

Heidari, M., Nikolinakou, M., Flemings, P., Hudec, M., 2018. Enhancing Modified Cam-Clay model for large stress range. ARMA 18-0790, 52nd U.S. Rock Mechanics/Geomechanics Symposium, Seattle, WA, 17-20 June.

Heidari, M., Nikolinakou, M., Hudec, M., Flemings, P., 2017. Geomechanical effects of a highly permeable sand layer in a salt basin. ARMA 17-0881, 51st U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA, 25-28 June.

Heidari, M., Nikolinakou, M., Flemings, P., 2017. Seismic pore pressure prediction enhanced with geomechanical modeling. AAPG Datapages/Search and Discovery Article #90291. AAPG Annual Convention and Exhibition, Houston, Texas, April 2-5, 2017.

- Lockhart, L.P., Flemings, P.B., Nikolinakou, M.A., Heidari, M., 2017. Pressure Prediction in a Complex Setting Based on Field Data and Geomechanical Modeling: Mad Dog Field, Gulf of Mexico. AAPG Datapages/Search and Discovery Article #90291. AAPG Annual Convention and Exhibition, Houston, Texas, April 2-5, 2017.
- Heidari, M., Nikolinakou, M., Hudec, M., Flemings, P., 2016. Geomechanical impacts of a welding salt layer on adjacent sediments. ARMA 16-035, 50th U.S. Rock Mechanics/Geomechanics Symposium, Houston, TX, 26-29 June.
- Lockhart, L.P., Flemings, P.B., Nikolinakou, M.A., Heidari, M., 2016. Pressure prediction in non-uniaxial settings based on field data and geomechanical modeling: a well example. AGU Fall Meeting. San Francisco, CA, December 12-16.
- Gao, B., Flemings, P.B., Saffer, D.M., Nikolinakou, M.A., Heidari, M., 2016. Mechanics of fold-and-thrust belt systems based on geomechanical modeling. AGU Fall Meeting. San Francisco, CA, December 12-16.
- Nikolinakou, M.A., Heidari, M., Hudec, M.R., Flemings, P.B., 2016. Stress, deformation and failure associated with salt-sheet emplacement. AGU Fall Meeting. San Francisco, CA, December 12-16.
- Heidari, M., Nikolinakou, M., Flemings, P., Hudec, M., 2015. A simplified analysis of stresses in rising salt domes and adjacent sediments. ARMA 15-159, 49th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA, 28 June–2 July.
- Sawyer, D., Akinci, L., Nikolinakou, M.A., Heidari, M., 2015. Links and Feedbacks between Salt Diapirs, Hydrates, and Submarine Landslides: Example from Cape Fear, offshore North Carolina, USA. AGU Fall Meeting. San Francisco, CA, December 12-16.

Conference poster presentations

- Heidari, M., Nikolinakou, M.A., Hudec, M., Flemings, P.B., 2017. Forward Hydro-Mechanical Modeling of a Rising Salt Diapir Considering the Effect of Basin Sand Layers. AAPG Datapages/Search and Discovery Article #90291. AAPG Annual Convention and Exhibition, Houston, Texas, April 2-5, 2017.
- Heidari, M., Nikolinakou, M., Flemings, P., 2016. A critical state model for mudrock behavior at high stress levels. AGU Fall Meeting. San Francisco, CA, December 12-16.
- Heidari, M., 2013. A Numerical Analysis of Wellbores in Shale with Viscoplastic Behavior. ARMA 13-0652, 47th U.S. Rock Mechanics/Geomechanics Symposium, San Francisco, CA, 23-26 June.

Annual presentations to research sponsors

- Heidari, M., Flemings, P.B., Nikolinakou, M., 2018, UT GeoFluids annual report to Industrial Associates for 2018: slide set 9: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, BHP, BP, Chevron, ConocoPhillips, ExxonMobil, Hess Corp, Murphy, Repsol, Schlumberger, Shell, Statoil, Total.
- Heidari, M., Flemings, P.B., Nikolinakou, M., 2018, UT GeoFluids annual report to Industrial Associates for 2018: slide set 23: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, BHP, BP, Chevron, ConocoPhillips, ExxonMobil, Hess Corp, Murphy, Repsol, Schlumberger, Shell, Statoil, Total.
- Heidari, M., Nikolinakou, M. A., Hudec, M. R., and Flemings, P. B., 2017, Applied Geodynamics Laboratory annual report to industrial associates 2017, slide set 04: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, Apache, BHP Billiton, BP, CGGVeritas, Chevron, Cobalt, ConocoPhillips, EcoPetrol, ENI, ExxonMobil, Fugro, Global Geophysical, Hess, ION Geophysical, Korea National Oil Corporation, McMoRan, Maersk, Marathon, Murphy, Nexen, Noble, Petrobras, PGS, Repsol-YPF, Samson, Saudi Aramco, Shell, Statoil, TGS-NOPEC, Talisman, Total, WesternGeco, and Woodside, CD-ROM.
- Heidari, M., Nikolinakou, M. A., Hudec, M. R., and Flemings, P. B., 2017, Applied Geodynamics Laboratory annual report to industrial associates 2017, slide set 09: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, Apache, BHP Billiton, BP, CGGVeritas, Chevron, Cobalt, ConocoPhillips, EcoPetrol, ENI, ExxonMobil, Fugro, Global

- Geophysical, Hess, ION Geophysical, Korea National Oil Corporation, McMoRan, Maersk, Marathon, Murphy, Nexen, Noble, Petrobras, PGS, Repsol-YPF, Samson, Saudi Aramco, Shell, Statoil, TGS-NOPEC, Talisman, Total, WesternGeco, and Woodside, CD-ROM.
- Heidari, M., Flemings, P.B., Nikolinakou, M., 2017, UT GeoFluids annual report to Industrial Associates for 2017: slide set 10: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, BHP, BP, Chevron, ConocoPhillips, ExxonMobil, Hess Corp, Murphy, Repsol, Schlumberger, Shell, Statoil, Total.
- Heidari, M., Flemings, P.B., Nikolinakou, M., 2017, UT GeoFluids annual report to Industrial Associates for 2017: slide set 14: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, BHP, BP, Chevron, ConocoPhillips, ExxonMobil, Hess Corp, Murphy, Repsol, Schlumberger, Shell, Statoil, Total.
- Heidari, M., Nikolinakou, M. A., Hudec, M. R., and Flemings, P. B., 2016, Applied Geodynamics Laboratory annual report to industrial associates 2016, slide set 02: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, Apache, BHP Billiton, BP, CGGVeritas, Chevron, Cobalt, ConocoPhillips, EcoPetrol, ENI, ExxonMobil, Fugro, Global Geophysical, Hess, ION Geophysical, Korea National Oil Corporation, McMoRan, Maersk, Marathon, Murphy, Nexen, Noble, Petrobras, PGS, Repsol-YPF, Samson, Saudi Aramco, Shell, Statoil, TGS-NOPEC, Talisman, Total, WesternGeco, and Woodside, CD-ROM.
- Heidari, M., Nikolinakou, M. A., Hudec, M. R., and Flemings, P. B., 2016, Applied Geodynamics Laboratory annual report to industrial associates 2016, slide set 13: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, Apache, BHP Billiton, BP, CGGVeritas, Chevron, Cobalt, ConocoPhillips, EcoPetrol, ENI, ExxonMobil, Fugro, Global Geophysical, Hess, ION Geophysical, Korea National Oil Corporation, McMoRan, Maersk, Marathon, Murphy, Nexen, Noble, Petrobras, PGS, Repsol-YPF, Samson, Saudi Aramco, Shell, Statoil, TGS-NOPEC, Talisman, Total, WesternGeco, and Woodside, CD-ROM.
- Heidari, M., Flemings, P. B., Nikolinakou, M., 2016, UT GeoFluids annual report to Industrial Associates for 2016: slide set 17: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, BHP, BP, Chevron, ConocoPhillips, ExxonMobil, Hess Corp, Murphy, Repsol, Schlumberger, Shell, Statoil, Total.
- Heidari, M., Nikolinakou, M. A., Hudec, M. R., and Flemings, P. B., 2015, Applied Geodynamics Laboratory annual report to industrial associates 2015, slide set 12: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, Apache, BHP Billiton, BP, CGGVeritas, Chevron, Cobalt, ConocoPhillips, EcoPetrol, ENI, ExxonMobil, Fugro, Global Geophysical, Hess, ION Geophysical, Korea National Oil Corporation, McMoRan, Maersk, Marathon, Murphy, Nexen, Noble, Petrobras, PGS, Repsol-YPF, Samson, Saudi Aramco, Shell, Statoil, TGS-NOPEC, Talisman, Total, WesternGeco, and Woodside, CD-ROM.
- Heidari, M., Nikolinakou, M. A., Hudec, M. R., and Flemings, P. B., 2015, Applied Geodynamics Laboratory annual report to industrial associates 2015, slide set 14: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, Apache, BHP Billiton, BP, CGGVeritas, Chevron, Cobalt, ConocoPhillips, EcoPetrol, ENI, ExxonMobil, Fugro, Global Geophysical, Hess, ION Geophysical, Korea National Oil Corporation, McMoRan, Maersk, Marathon, Murphy, Nexen, Noble, Petrobras, PGS, Repsol-YPF, Samson, Saudi Aramco, Shell, Statoil, TGS-NOPEC, Talisman, Total, WesternGeco, and Woodside, CD-ROM.
- Heidari, M., Flemings, P. B., Nikolinakou, M., 2015, UT GeoFluids annual report to Industrial Associates for 2015: slide set 13: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, BHP, BP, Chevron, ConocoPhillips, ExxonMobil, Hess Corp, Murphy, Repsol, Schlumberger, Shell, Statoil, Total.
- Heidari, M., Flemings, P. B., Nikolinakou, M., 2015, UT GeoFluids annual report to Industrial Associates for 2015: slide set 21: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, BHP, BP, Chevron, ConocoPhillips, ExxonMobil, Hess Corp, Murphy, Repsol, Schlumberger, Shell, Statoil, Total.
- Heidari, M., Nikolinakou, M. A., Hudec, M. R., and Flemings, P. B., 2014, Applied Geodynamics Laboratory annual report to industrial associates 2014, slide set 5: The University of Texas at

Austin, Bureau of Economic Geology, annual report prepared for Anadarko, Apache, BHP Billiton, BP, CGGVeritas, Chevron, Cobalt, ConocoPhillips, EcoPetrol, ENI, ExxonMobil, Fugro, Global Geophysical, Hess, ION Geophysical, Korea National Oil Corporation, McMoRan, Maersk, Marathon, Murphy, Nexen, Noble, Petrobras, PGS, Repsol-YPF, Samson, Saudi Aramco, Shell, Statoil, TGS-Nopec, Talisman, Total, WesternGeco, and Woodside, CD-ROM.

Heidari, M., Flemings, P. B., Nikolinakou, M., 2014, UT GeoFluids annual report to Industrial Associates for 2014: slide set 14: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, BHP, BP, Chevron, ConocoPhillips, ExxonMobil, Hess Corp, Schlumberger, Shell, Statoil.

Heidari, M., Nikolinakou, M. A., Hudec, M. R., and Flemings, P. B., 2013, Applied Geodynamics Laboratory annual report to industrial associates 2013, slide set 4: The University of Texas at Austin, Bureau of Economic Geology, annual report prepared for Anadarko, Apache, BHP Billiton, BP, CGGVeritas, Chevron, Cobalt, ConocoPhillips, EcoPetrol, ENI, ExxonMobil, Fugro, Global Geophysical, Hess, ION Geophysical, Korea National Oil Corporation, McMoRan, Maersk, Marathon, Murphy, Nexen, Noble, Petrobras, PGS, Repsol-YPF, Samson, Saudi Aramco, Shell, Statoil, TGS-Nopec, Talisman, Total, WesternGeco, and Woodside, CD-ROM.

Theses

Thesis for M.Sc. in Structural Engineering

An Eulerian constitutive model for large elastoplastic deformation.

Thesis for M.Sc. in Earthquake Engineering

A constitutive model for large viscoelastic deformation.

Dissertation for P.h.D. in Geotechnical Engineering

Time-dependent analysis of jet-grouted tunnels in difficult ground conditions.

Teaching

Teaching Assistant for the course "Introduction to Numerical Methods", University of Texas at Austin, 2010-2012.

Languages Spoken

English (540 in GRE verbal and 800 in GRE quantitative; 603 in TOEFL)

Arabic, Farsi