



**Exponent®**  
Engineering & Scientific Consulting

**Hala El Fil, Ph.D., P.E.**

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## Professional Profile

Dr. El Fil specializes in geotechnical engineering, soil mechanics, and rock mechanics. She has experience in evaluating shallow and deep foundation systems, retaining structures, soil-structure interaction, geotechnical instrumentation, and in conducting settlement and ground movement analyses.

Dr. El Fil has investigated and analyzed ground movement due to settling and expanding soils and evaluating resulting damages to structures from earth movement. She has been involved in projects throughout the United States and internationally.

At Purdue University, Dr. El Fil's doctoral research combined the interdisciplinary fields of rock mechanics and geophysics. She employed active seismic monitoring—shear and compressional ultrasonic waves—to study rock discontinuity failure for well-matched and mismatched rock discontinuities at the laboratory scale. Her work resulted in an understanding of when seismic precursors to shear failure in rock discontinuities can be detected. Her technical expertise from her doctoral studies includes advanced geophysical and rock mechanics testing and data analysis. She has experience with artificial neural networks (ANN), conducting and analyzing 3D microCT Xray imaging, scanning electron microscopy (SEM) imaging, and Energy-dispersive X-ray (EDX) spectroscopy.

## Academic Credentials & Professional Honors

Ph.D., Civil Engineering, Purdue University, 2021

M.Sc., Civil Engineering, American University of Beirut, Lebanon, 2017

B.E., Civil Engineering, American University of Beirut, Lebanon, 2016

Gerald and Beryl Leonards Fellowship Award at Purdue University, 2017-2019

## Academic Appointments

Teaching Assistant, Purdue University, 2021

Research Assistant, Purdue University, 2017-2021

## Prior Experience

Geotechnical Engineering Intern, Khatib & Alami, Inc., 2015

## Professional Affiliations

American Society of Civil Engineering (ASCE)

American Rock Mechanics Association (ARMA)

## Languages

Arabic

French

## Publications

El Fil, H., Pyrak-Nolte, L. J., & Bobet, A. (2021). Transmitted, Reflected, and Converted Modes of Seismic Precursors to Shear Failure of Rock Discontinuities. In 55th US Rock Mechanics/Geomechanics Symposium.

Moro, C., El Fil, H., Francioso, V., & Velay-Lizancos, M. (2020). Influence of water-to-binder ratio on the optimum percentage of nano-TiO<sub>2</sub> addition in terms of compressive strength of mortars: A laboratory and virtual experimental study based on ANN model. Construction and Building Materials, 120960.

El Fil, H., Bobet, A and Pyrak-Nolte, L. J. (2019). Mechanical and Geophysical Monitoring of Slip along Frictional Discontinuities. In 53rd US Rock Mechanics Symposium, New York.

## Presentations

El Fil, H., Pyrak-Nolte, L. J., & Bobet, A. (2021). Transmitted, Reflected, and Converted Modes of Seismic Precursors to Shear Failure of Rock Discontinuities. In 55th US Rock Mechanics/Geomechanics Symposium.

El Fil, H., Bobet, A and Pyrak-Nolte, L. (2019). Mechanical and Geophysical Monitoring of Slip along Frictional Discontinuities. In 53rd US Rock Mechanics Symposium, New York.