Exneyder A. Montoya-Araque

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Education

2022 – At present **Doctorate in Engineering**, *Universidad EAFIT (Colombia) and CentraleSupélec at Université Paris-Saclay (France)*, double degree through an international joint thesis supervision (cotutelle)
Advisors: Silvana Montoya-Noguera, *PhD.* & Fernando Lopez-Caballero, *PhD.*

2017 – 2019 **Master in Engineering – Geotechnics**, *Universidad Nacional de Colombia*, Medellín
Advisor: Lúdger O. Suárez Burgoa, *PhD.*

2010 – 2016 **Geological Engineering**, *Universidad Nacional de Colombia*, Medellín
Advisor: Lúdger O. Suárez Burgoa, *PhD.*

Academic Experience

Research

Aug. 2017 – Aug. 2018 **Young Researcher**, *COLCIENCIAS – UNAL*, Medellín, Ant. Colombia
Research Title: Slope stability analysys in BIMs by the limit equilibrium method with the A* algorithm.

Teaching

Jul. 2022 – At present **Adjunct Professor**, *Universidad EAFIT*, Medellín, Ant. Colombia
Laboratory of applied soil mechanics (2022-2), Slope stability (2022-2, 2023-1)

Feb. 2021 – Nov. 2022 **Adjunct Professor**, *Universidad EIA*, Envigado, Ant. Colombia
Structural Geology (2021-1, 2022-2), Geomorphology (2021-2), General Geology (2022-1, 2022-2).

Industry Experience

Jan. 2016 – Jan. 2022 **Assistant to Junior Specialist Engineer (employee contracts)**, *Ingeniería, Tecnología e Instrumentación S.A. - INTEINSA*, Medellín

Apr. 2016 – Jun. 2016 **Assistant (freelance contract)**, *Corporación Ambiental Visión Verde*, Medellín.

Languages

Spanish	English	French
Native	B2	A2

IT Skills

Programming: Python 3, R, MatLab/Octave, LaTeX, Markdown.
Markup lang.: LaTeX and Markdown.
OS: Microsoft Windows and Linux: Ubuntu.
GIS: ArcGis, QGis, Global Mapper, Google Earth
Drawing: CAD: AutoCAD and Civil3D, Vector: Inkscape/CorelDraw, Raster: Gimp

Publications

[1] E. A. Montoya-Araque and S. Montoya-Noguera, "Sensitivity Analysis of a Physically Based Model to Assess Rainfall-Triggered Shallow Landslides," *Geotechnical and Geological Engineering*, 4 2023.

[2] E. A. Montoya-Araque, A. Aparicio-Ortube, D. G. Zapata-Medina, and L. G. Arboleda-Monsalve, "An open-source application software to determine the preconsolidation pressure of soils in incremental loading oedometer testing: pySigmaP," *SoftwareX*, vol. 17, p. 100990, 1 2022.

[3] A. Ariza-Triana, E. A. Montoya-Araque, and L. O. Suarez-Burgoa, "Modeling of Bimrock/Bimsoil Structures by Means of Circular Particles Packed in R2," in *Lecture Notes in Civil Engineering* (M. Barla, A. Di Donna, and D. Sterpi, eds.), vol. 126, pp. 737–743, Cham: Springer International Publishing, 2021.

[4] E. A. Montoya-Araque, L. O. Suarez-Burgoa, and E. W. Medley, "Application of the tortuous surface method to stochastic analysis of bimslope stability," *Bulletin of Engineering Geology and the Environment*, vol. 79, pp. 5329–5340, 12 2020.

[5] E. A. Montoya-Araque and L. O. Suarez-Burgoa, "Evaluación de estabilidad de taludes compuestos por bimsoils/bimrocks mediante modelación computacional de superficies de falla tortuosas con el algoritmo A*," in *Memorias del XVI Congreso Panamericano de Mecánica de Suelos e Ingeniería Geotécnica – Geotechnical Engineering in the XXI Century: Lessons learned and future challenges*, (Cancún, México), pp. 628–636, 2019.

[6] L. O. Suarez-Burgoa, A. Ariza-Triana, and E. Montoya-Araque, "Modelamiento de estructuras de bimsoils mediante el empaquetado de partículas circulares en R2," *Revista de la Facultad de Ciencias*, vol. 8, pp. 115–137, 7 2019.

[7] E. A. Montoya-Araque and L. O. Suarez-Burgoa, "Automatic generation of tortuous failure surfaces in block-in-matrix materials for 2D slope stability assessments," *Computers and Geotechnics*, vol. 112, pp. 17–22, 8 2019.

[8] E. A. Montoya-Araque and L. O. Suarez-Burgoa, "pyBIMstab: Application software for 2D slope stability analysis of block-in-matrix and homogeneous materials," *SoftwareX*, vol. 7, pp. 383–387, 1 2018.

[9] E. A. Montoya-Araque and L. O. Suarez-Burgoa, "Software de aplicación en Python 3 para el cálculo de la estadística de tensores de segundo orden de Jelinek en datos de anisotropía de susceptibilidad magnética," *Boletín de Ciencias de la Tierra*, no. 44, pp. 49–58, 2018.

[10] L. O. Suarez-Burgoa and E. A. Montoya-Araque, "Programa en código abierto para el análisis bidimensional de estabilidad de taludes por el método de equilibrio límite," *Revista de la Facultad de Ciencias*, vol. 5, pp. 88–104, 7 2016.

Honors

May 2019	Master's thesis with Laureate Distinction.	*UNAL, Facultad de Minas*
Aug. 2016	Honor roll: Geological Engineer	*UNAL, Facultad de Minas*

Software development

pyNewmarkDisp	Application software for spatial calculation of permanent displacements due to ground motion based on Newmark's sliding block method. ©2022, Exneyder A. Montoya-Araque, Silvana Montoya-Noguera, Fernando López-Caballero & Universidad EAFIT.
pySigmaP	Application software for calculating the preconsolidation pressure of soils in incremental loading (IL) oedometer testing by several methods. ©2020, Exneyder A. Montoya-Araque, Alan J. Aparicio-Ortube, David G. Zapata-Medina, Luis G. Arboleda-Monsalve & UNAL.
pyBIMstab	Application software to evaluate the factor of safety against sliding of slopes made of Blocks-In-Matrix (BIM) materials along tortuous surfaces. ©2018, Exneyder A. Montoya-Araque, Ludger Suárez-Burgoa & UNAL.
jelinekstat	Application software in Python 3 to apply the Jelínek's (1978) statistical model for a sample of n 2nd-order tensors. ©2018, Exneyder A. Montoya-Araque, Ludger Suárez-Burgoa & UNAL.

pyCSS Circular Slope Stability pyProgram: 2D slope stability analysis by the limit equilibrium method using the Fellenius and Bishop methods. ©2016, Ludger Suárez-Burgoa, Exneyder A. Montoya Araque & UNAL.

Academic events

Sept. 15th – 23rd, 2018 **Lecture**, *AEG 61st Annual Meeting / IAEG XIII Congress*, San Francisco (EEUU)
Automatic Generation of Tortuous Failure Surfaces in Bimsoils to Evaluate the Stability of 2D Slopes – **Authors:** E. A. Montoya-Araque and L. O. Suarez-Burgoa (Lecturer)

Aug. 14th – 19th, 2018 **Lecture**, *XIII Technical Week of Geology, Geological Eng. and Geosciences*, Manizales
Evaluación de estabilidad de taludes compuestos por bimsoils mediante modelación computacional de superficies de falla tortuosas – **Authors:** E. A. Montoya-Araque (Lecturer) and L. O. Suarez-Burgoa

Aug. 9th – 14th, 2016 **Poster**, *XII Technical Week of Geology and Geological Engineering*, Medellín
Circular Slope Stability pyProgram (PyCSS): Programa de código abierto en Python para el análisis de estabilidad de taludes en 2D, métodos Fellenius y de Bishop. – **Authors:** L. O. Suarez-Burgoa and E. A. Montoya-Araque

Aug. 31st – Sep. 5th, 2015 **Poster**, *XV Colombian Geology Congress*, Bucaramanga
Renovación de la sala de exhibición del Museo de Geociencias de la Facultad de Minas, Universidad Nacional de Colombia – **Authors:** M. Weber (Speaker), C. de Santis, N. Acevedo, L. Arce, J. Barón, A.C. Chica, E. García, N. Gómez, G. Guevara, E. Montoya, , G. Morales, J. E. Otálvaro, L. Patiño, J.O. Pérez, Y. Rodríguez

References

At academy **Daniel Felipe Ruiz**, Phd., Msc., Civil Eng., Assistant Professor at School of Applied Sciences and Engineering, Universidad EAFIT, Colombia., dfruizr@eafit.edu.co

Marion Weber Scharff, Phd., Geologist, Assistant Professor at Geoscience and Environmental Department, Facultad de Minas, Universidad Nacional de Colombia., mweber@unal.edu.co

Lúdger O. Suárez-Burgoa, Phd., Msc., Civil Eng., Assosiate Professor at Civil Engineering Department, Facultad de Minas, Universidad Nacional de Colombia, losuarezb@unal.edu.co

At industry **Gonzalo Betancur Betancourt**, Msc., Civil Eng., Projects Director at INTEINSA., gonzalo.betancur@inteinsa.com, Cel.: (+57) 300 777 5133

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