

Dr. MARIA ELISA ELBERG

Doctor in Applied Sciences. Magister Scientiae in Structural Engineering. Civil Engineer

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OVERVIEW

Dr. Elberg has over fourteen years of experience working as a professor in the Geological Engineering Department of the University de Los Andes in Venezuela. In those 14 years she has supervised over 40 researches papers of students under her instruction. She has over 50 publications and created three courses for the Master Degree Program in Applied Mathematics in Engineering. Dr. Elberg during her PhD studies and thesis, has developed a methodology for predict concentration of energy, possible data of its release and magnitude in seismic zones using finite element methods and artificial intelligence. She has received 17 awards for her research and has attended over 30 conferences. She received "Mariano Picon Salas Order First Class" as number one in Geological Engineering University of Los Andes in 2014. She speaks, reads and writes Spanish and English.

AREAS OF EXPERTISE

- Civil Engineering, Geological Engineering
- Structural Engineering
- Geotechnical. Geomechanical and Geodynamic
- Numerical Methods - Finite Element Method – Geomechanical Simulation
- Artificial Intelligence - Artificial Neural Network and Genetic Programming

EDUCATION

Doctor in Applied Sciences from the University of Los Andes, Faculty of Engineering. Venezuela, 2014.

Masters of Science in Structural Engineering from the University of Los Andes, Faculty of Engineering, Venezuela, 2002.

Civil Engineering Degree from the University of Los Andes, Faculty of Engineering, Venezuela, 1992.

Specialization courses in Total Quality from University of Valle de Atemajac, Guadalajara, México, 1997.

English as a Second Language from El Paso Community College, El Paso, Texas, USA, 1996.

Programmer in Scientific Application Degree from the University Polytechnic of Valencia, Spain, 1985.

EXPERIENCE

- **University of Los Andes. Faculty of Engineering. Geological Engineering. Geomechanical Department. Merida, Venezuela.**
 - **Associate Professor, 2000-now**
 - Director of Research Group in Applied Geology, 2004-2011
 - Director of Department of Geomechanics, 2010-2011, 2005-2007
 - Director of Laboratory of Subsurface Interpretation, 2004-2008.
- University Polytechnic Santiago Mariño. Faculty of Engineering. Civil Engineering. Merida, Venezuela. Professor, 1998-2000
- PLANDES. University of Los Andes. Merida, Venezuela. Structural Engineer, 1994-1995
- Scandia Designs & Investment. Mérida Venezuela, Structural Engineer, 1992-1994
- Corporación Venezolana de Guayana, Guayana City, Venezuela. Industrial Internship, 1991-1992.
- Consejo de Computación Académica, University of Los Andes. Faculty of Engineering. Teaching Assistant, 1990-1991

AWARDS

- **Distinction First Class “Mariano Picon Salas”, 2014**, Number one in Geological Engineering.
- **PEII Award 2013**. Research Promotion Program. National Observatory of Science, Technology and Innovation.
- **PPI Award 2011**. Research Promotion Program. National Observatory of Science, Technology and Innovation.
- **PEII Award 2011**. Research Promotion Program. National Observatory of Science, Technology and Innovation.
- **PEI Award 2011**. Council of Scientific, Humanistic and Technological University of Los Andes, CDCHT.
- **PPI Award 2008**. Research Promotion Program. National Observatory of Science, Technology and Innovation.
- **PEI Award 2007**. Council of Scientific, Humanistic and Technological University of Los Andes, CDCHT.
- **Recognition as Coordinator Organizing Committee of the Second Academic Conference ULA-PDVSA**. 2006.
- **PEI Award 2005**. Council of Scientific, Humanistic and Technological University of Los Andes, CDCHT.
- **Recognition as Coordinator Organizing Committee of the First Conference Academic ULA-PDVSA**, 2004.
- **Recognition as tutor of one of the seven best published thesis, elected in Engineering Geology XX Anniversary**, 2004, University of Los Andes, Faculty of Engineering. Merida Venezuela.
- **Recognition as a tutor for the best thesis in Geological Engineering Geomechanics in the Anniversary of the Faculty of Engineering, 2004**, University of Los Andes, Faculty of Engineering, Merida Venezuela.
- **CONABA Award 2002**, National Commission for Academic benefit for Universality Professors.
- **Recognition as a member of the organizing committee of the First Conference on Computational Geomechanics Scientific Techniques, 2003**, University of Los Andes, Faculty of Engineering. Merida Venezuela.
- **Recognition as a member of the Technical Council of the School of Civil Engineering, 2001**, Polytechnic University Santiago Mariño, Merida Venezuela.
- **Recognition as a member of the organizing committee of the Third Conference, A & C Advanced Engineering, 2001**. Polytechnic University Santiago Mariño, Merida Venezuela.
- **Recognition as Tutor in Civil Engineering, 2000**, Polytechnic University Santiago Mariño, Merida Venezuela.
- **Recognition as a Special Jury Grade work in Civil Engineering, 2000**, Polytechnic University Santiago Mariño, Merida Venezuela.

STUDENTS ADVISOR. GRADUATE STUDENTS. THESIS

- Numerical analysis of the contact between, Eurasian Hindu and Arabic tectonic plates. Jesus Torres, 2014.
- Numerical analysis of the Himalayan orogeny. José Gregorio Gutiérrez, 2012.
- Analysis of interaction soil-structure on slopes using finite element method. Alba Pinto, 2007.
- Geomechanical simulation applied to the analysis of slopes in Venezuela. Grelys Sosa, 2007.
- Geomechanical Stability Study in petroleum fields Caipe, Torumos, Maporal and Bishop. Neida Moreno, 2006.
- Natural Hazards in Urban Areas, A Proposed Zoning. Scarlett Rosales, 2004.
- Application of H-Adaptive refinement process for two-dimensional problems. José Mora, 2002.

STUDENTS ADVISOR. UNDERGRADUATE STUDENTS. THESIS

- Geomechanical simulations of slopes in road 07, El Playon sector, Municipality Libertador, Merida. Carmemaria Hernandez and Lorna Ojeda, 2013
- Artificial neural network applied in the estimation of behavior of Bocono fault. Wandha Andrade, 2012.
- Geomechanic simulation using Finite Element method in slopes in Jose Antonio Paez dam, in Santo Domingo, Merida State, Venezuela. Noelia Ogaya, 2010.
- Geonumerical simulation of tunnels A and B of the north perimeter, in Merida city using Finite Element Method. Marlím Vergara and Dinorath Mogollón, 2010.
- Finite Element method applied in the analysis of estimation of Bocono fault and its effect on the town of Mesa de los Indios. Marisela Sánchez and Jackeline Peña, 2010
- Geomechanic simulation in porous environment in Santa Teresa Tunnel in road 008, Venezuela. Liz Valbuena, 2010
- Using numerical simulation in the evaluation of the compaction process of the fill material used in the construction of the access road to the third Orinoco Bridge. Patricia Gil Otaiza, 2010.
- Analysis of the geological security close to the Chama Bridge. Dilcar Joali Paredes, 2010
- Analysis of the stress-strain system in the slopes in El Carrizal B due to Bocono fault. Ysamar Pino, 2010

- Numerical Analysis of the geological joints rock in the massif of the Rafael Caldera freeway in Venezuela. Janisse Vivas and Vanessa Fernandez, 2009.
- Geomechanical simulation of La Cabrera Bridge and la Victoria fault system determining geological risk using an elastic model. Zeira Arana, 2006.
- Geomechanic simulation of the geological risk zones in the coast of the Carabobo state using an elastic model. Grellys Sosa and Amparo Alam, 2006.
- Analysis of zones of height geological risk in Miranda state using Geomechanical simulation with finite element method. Carolina Sayago and Milagros Paredes, 2006.
- Analysis of Estanques Tunnel, on Freeway Rafael Caldera and Mesa Bolivar fault using Geomechanical simulation and finite element method. Noel Quintero, 2004.
- Geomechanical simulation of earth dams with emptying fast using finite element method. Andrés Lacruz, 2005.
- Geomechanic simulation of La Hechicera fault using finite element method. Daniel Cabello and Maria Eugenia Navarrete, 2005.
- Geomechanical simulation of earth dams using a pore elastoplastic model using Finite Element Method. Amaluz Angarita and Javier Cancelo, 2004.
- Geomechanical simulation of slopes using elastic models. María del Pilar Rodríguez, 2004.
- Geomechanical simulation of earth dams using elastic models. Ana Mitzaida Pérez, 2004.
- Geomechanical simulation of slopes and determination of effects duo to an earthquake. Eoly Infante and Roberto Torres, 2004.
- Geomechanical simulation of the compaction as a recovery mechanism in a petroleum field. Adriana Rodríguez and Gledys Ramírez, 2003.
- Folds simulations in an elastic model. Norymar Higuera, 2003.
- Geomechanical simulation of oil extraction process. Isabel Contreras, 2003.
- Method for evaluation of overload capacity in buildings modified in design and use. Javier Rojas, 2001.
- Behavior of the structural wood with humidity. Yusmary Pacheco, 2001.
- Association of infrastructures to natural erosive process. Scarlett Rosales, 2000.
- Polypropylene fibers for coated friezes. Rosa Rondón, 2000.
- Drainage study in urban ways. Armando Guerrero, 2000.
- Application of geotextiles in road resurfacing. Edgar Carrizo, 1999.
- Analysis of the main features of aggregates for concrete mix. Linouska Peña, 1999.
- Road Project. Fabia Carreño, 1998.

SOCIETIES AND ACADEMIES

- Association of Professors of University of Los Andes
- Association of Engineers of Venezuela
- Member of the Spanish Society for Numerical Methods in Engineering
- Member of the Venezuelan Society for Numerical Methods in Engineering

SCIENTIFIC SEMINARS, last 10 seminars

- **XII International Congress on Numerical Methods and Applied Sciences.** Porlamar, Venezuela. Two papers presented 2014.
- **XI International Congress on Numerical Methods and Applied Sciences.** Three Papers presented 2012.
- **X International Congress on Numerical Methods and Applied Sciences.** Mérida. Mérida, Venezuela. Four papers presented, 2010.
- **I Venezuelan Congress of Geo - Science.** Caracas, Venezuela. One paper presented, 2011.
- **IX International Congress on Numerical Methods and Applied Sciences.** Porlamar, Venezuela. Four papers presented, 2008.
- **IX Venezuelan Geographical Congress.** Caracas, Venezuela. One paper presented, 2007.
- **VI Jornadas Científico Técnicas de la Facultad de Ingeniería.** Mérida, Venezuela. Three papers presented, 2007.
- **XIII Pan-American Conference on Soil Mechanics and Geotechnical Engineering.** Porlamar, Venezuela. Three papers presented, 2007.

- **IV International Congress and II National Congress on Numerical Methodes In Engineering and Applied Science.** México. Four papers presented, 2007.
- **VI Congreso Científico Técnico de Universidad de Oriente.** Puerto La Cruz, Venezuela. One paper presented, 2006.

PUBLICATIONS IN SCIENTIFIC JOURNALS

- Leonardo González; Alejandro Jaramillo, **Maria Elisa Elberg**, Tomas Labrador, Edixon Barrios. Evidence of the structural reversal using "Pop Up" structures along the transcurrent fault Lama-Icotea, in Maracaibo, Venezuela. Scientific paper accepted for publication in Journal of Science and Engineering. April 2014.
- **Maria Elisa Elberg**, Leonardo González, Francisco Hidrobo, José Aguilar. Numerical Analysis of the Andes Uplift in South America Using Deformation Energy. Revista Ciencia e Ingeniería. Vol. 33, No. 1, March 2012. ISSN 2244-8780
- **Maria Elisa Elberg**, J. Vivas, V. Fernández, G. Sosa y L. González. Numerical Analysis of the Rock Masses Discontinuities of the Highway Rafael Caldera in Venezuela. Journal of Science and Engineering, April 2011. Vol. 32, No 2. ISSN 1316-7081.
- **Maria Elisa Elberg**, Felvir Rivas y Kay Tucci. Characterization of Seismic Activity in Bocono Fault Using Non Lineal Techniques. Journal of Science and Engineering, August 2008, Vol. 29, Nº 3. ISSN 1316-7081.
- **Maria Elisa Elberg**, Grelys Sosa y Maria Alam. Finite Element Method Application to the Simulation of Areas Susceptible to Mass Movements in the Coastal Area of Carabobo state in Venezuela. Journal of Science and Engineering, Julio 2008, Vol. 29, Nº 2. ISSN 1316-7081.
- **Maria Elisa Elberg**, A. Rodríguez y G. Ramírez. Hydrocarbon Extraction Geomechanical Simulation Applying an Elastoplastic Model. Journal of Science and Engineering, Agust 2006, Vol. 27, Nº 3. ISSN 1316-7081
- **Maria Elisa Elberg** y H. Febres. H Adaptive Refinements Process by using Deformation Energy Index. Journal of Science and Engineering, September 2004, Vol. 25, Nº 3. ISSN 1316-7081.

PUBLISHED. CHAPTERS IN BOOKS

- **Engineering and Applied sciences: Mathematical and Numerical Models.** ISBN: 978-980-7161-04-6. E. Dávila, J. Del Rio, M. Cerrolaza, R. Chacon. (Editors). Caracas, Venezuela 2014.
 - **Maria Elisa Elberg**, Francklin Rivas. **ChaptherGG-63.** Artificial Neural Network applied to analyze the effect of deformation energy in the South American seismic zone.
 - **Maria Elisa Elberg**, Carmemaria Hernandez y Lorna Ojeda. **ChaptherGG-51.** Finite Element Method applied to the analysis of the Geomechanical behavior in the interaction between lutite and sandstone.
 - Grelys Sosa, Mariela Barroeta, MariaGonzalez y **Maria Elisa Elberg.** **ChaptherGG-15.** Application of the Finite Element Method in the analysis of slopes between in San Juan de Lagunillas and Lagunillas.
- **Advances in computer simulation and numerical modeling.** ISBN: 978-980-7161-03-9. E. Dávila, G. Uzcátegui, M. Cerrolaza. (Editors). Caracas. Venezuela 2012.
 - José Gregorio Gutiérrez y **Maria Elisa Elberg.** **Chapter GG-16.** Numerical Analysis of the Himalayan Orogeny.
 - **Maria Elisa Elberg** y Noelia Ogaya. **Chapter GG-42.** Geomechanics Simulation Using Finite Element Method in Slopes in Jose Antonio Parez Dam.
 - **Maria Elisa Elberg**, Francklin Rivas, Wandha Andrade y Jose Aguilar. **Chapter GG-54** Artificial Neural Network Applied to the Estimation of the Behavior of Bocono Fault.
- **Computational Models in Engineering.** ISBN: 978-980-7161-02-2. R. Chacón, F. León. V. Duarte. O. Verisategui. (Editors). Caracas. Venezuela 2010.
 - **Maria Elisa Elberg**, Carolina Sayago, Milagros Paredes. **Chapter GG-25.** Analysis of Zones of Height Geological risk in Miranda Using Geomechanical Simulation with Finite Element Method.
 - José Gutiérrez, Jesús Torres y **Maria Elisa Elberg.** **Chapter GG-43.** Using Finite Element Method in the Numerical Analysis of Formation of Himalaya due to the contact between tectonic plates Eurasian, Indian and Arabic.
 - Jesús Torres, José Gutiérrez y **Maria Elisa Elberg** **Chapter GG-49.** Numerical Simulation in the Contact of Tectonic Plates Eurasian, Australia and Philippines.
- **Desarrollo y avances en métodos numéricos para ingeniería y ciencias aplicadas.** ISBN: 978-980-7167-00-8. L. Martino, V. Carrera, G. Larrazábal y M. Cerrolaza (Editores). Caracas, Venezuela, 2008.
 - **Maria Elisa Elberg** y Grelys Sosa. **Chapter MS-61.** Analysis of the Deformation Energy in the Tectonic Plates South American, Caribe and Nazca using Finite Element Method.

- **Simulación y Modelado en Ingeniería y Ciencias.** ISBN: 980-00-2315-1. B. Gámez, D. Ojeda, G. Larrazábal y M. Cerrolaza (Editores). Caracas, Venezuela, 2006.
 - **Maria Elisa Elberg,** Javier Cancelo y Amaluz Angarita. **Chapter MS-41.** Geomechanical Simulation of Earth Dams using an pore Elastoplastic Model using Finite Element Method.
 - **Maria Elisa Elberg,** Jesús Quintero, Leonardo González y Francisco Bongiorno. **Chapter MS-65.** Analysis of Estanques Tunnel, on Freeway Rafael Caldera and Mesa Bolivar fault using Geomechanical Simulation and Finite Element Method.

STUDENTS GUIDES PUBLISHED

- Strength of materials. Exercise guide. 2005.
- Topography. Exercise guide. 2002.
- Descriptive Geometry, Handbook of Interactive Support. 1999.

Languages

Spanish, First Language

English, Second Language. El Paso Community College, EPCC, El Paso, Texas, USA, 1996

RESEARCH AND PROJECTS. Financed by the Scientific, Humanistic and Technological Council. ULA

- Project: I-1278-11-02-EM. Numerical Analysis of the Himalayan Orogeny
- Project: I-1277-11-02-F. Artificial Neural Network applied in the estimation of behavior of Bocono fault.
- Project: I-1228-10-02-F Using Numerical Simulation in the evaluation of the compaction process of the fill material used in the construction of the access road to the third Orinoco Bridge
- Project: I-1222-10-02-F. Geomechanic Simulation in porous environment in Santa Teresa Tunnel on road 008, Venezuela.
- Project: I-1205-09-02-F. Analysis of the geological security close to the Chama Bridge
- Project: I-1192-09-02-F. Numerical Analysis of the geological joints rock in the massif of the Rafael Caldera Freeway in Venezuela.
- Project: I-1055-07-02-D. Geomechanical simulation applied to the local effects in slopes close to Merida city.
- Project: I-985-06-02-B. Analysis of the deformation energy in contact zones in tectonic plates using finite element method.
- Project: I-1054-07-02-D. Analysis of the interaction soil-structure in slopes close to Merida city.
- Project: I-990-06-02-F. Geomechanical simulation of La Cabrera Bridge and la Victoria fault system determining geological risk using an elastic model.
- Project: I-989-06-02-F. Geomechanical simulation of the geological risk zones in the coast of the Carabobo state using an elastic model.
- Project: I-918-06-02-F. Analysis of Estanques Tunnel, on Freeway Rafael Caldera and Mesa Bolivar fault using Geomechanical simulation and finite element method.
- Project: I-839-05-02-F. Geomechanical simulation of La Hechicera fault using finite element method.
- Project: I-777-04-02-F. Geomechanical simulation of earth dams using elastic models.
- Project: I-760-03-02-F. Geomechanical simulation of the compaction as a recovery mechanism in a petroleum field.
- Project: I-756-03-06-EM. Natural Hazards in Urban Areas, A Proposed Zoning.
- Project: I-738-02-02-F. Folds simulations in an elastic model.

COURSES

- **Postgraduate courses**
 - **Geomechanic Simulation, Master in Applied Mathematic.** Faculty of Engineering, University of Los Andes.
 - **Fundamental Mechanics, Master in Applied Mathematic.** Faculty of Engineering, University of Los Andes.
 - **Finite Elements, Master in Structural Engineering.** Faculty of Engineering, University of Los Andes.
 - **Numerical Analysis I, Master in Applied Mathematic.** Faculty of Engineering, University of Los Andes.
 - **Numerical Analysis II, Master in Applied Mathematic.** Faculty of Engineering, University of Los Andes.

- **Undergraduate courses**
 - **Strength of Materials**, Faculty of Engineering, University of Los Andes
 - **Topography**, Faculty of Engineering, University of Los Andes
 - **Rock mechanics**, Faculty of Forest Sciences. University of Los Andes.
 - **Soil Mechanics**. Faculty of Forest Sciences. University of Los Andes.

- **Extension courses**
 - **Geomechanic Simulation - Finite Elements**
 - **Geomechanics and Finite Element Simulation for Beginners**
 - **ABAQUS**
 - **Rock Mechanics**
 - **Rock Mechanics for Non-Geologists**
 - **Altimetric Topography - Selection and design of roads in mountainous areas.**

OTHER ACTIVITIES

- **Scientific Exchange with the University Complutense of Madrid and the Geological and Mining Institute of Spain.** 2006.
- **Creation of the Project of the Master in Applied Geology**, Faculty of Engineering, University of Los Andes. 2005.
- **Creation of the course Geomechanical Simulation for the Master in Applied Mathematic.** Faculty of Engineering, University of Los Andes. 2004.
- **Scientific Exchange with University of Chile, Santiago, Chile.** Faculty of Physical and Mathematical Sciences. 2003.
- **Creation of the course Fundamental Geomechanical for the Master in Applied Mathematic** Faculty of Engineering, University of Los Andes. 2002.
- **Creation of Software Plus One** for the graduate students from the master in Structural Engineering. 2002.
- **Creation of the project of the Computational Geomechanics in the Applied Mathematics Master of Engineering.** 2002.
- **Coordination of Extension Courses in the Laboratory of surface Interpretation.** 2004-2011