Pablo Segarra

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EXPERIENCE

2007-…: Associate Professor at Universidad Politécnica de Madrid (UPM)-ETSI Minas y Energía, Spain

- Lecturing Rock Blasting, Explosives Engineering, Fundamentals of Chemistry, and Geomatics.
- PhD. Thesis Supervisor and training of Research Fellows.
- MSc. Thesis Supervisor
- Mentoring of students in Internships.
- In charge of administrative tasks: Subject coordinator, coordinator of laboratories of the Department (Sept. 2010- Oct. 2013), and Deputy Director of Chemical Engineering and Fuels Department (Jun. 2012-Oct. 2013).

2005-2007: Post-doc researcher at UPM-ETSI Minas

- Management of blasting monitoring devices.
- Responsible for optimizing mining operations. Development of a model to estimate of the productivity of excavators in metal mining.
- Internship (3 months) at University of Toronto-Department of Civil Engineering. Invited Lecturer in Lassonde Institute of Engineering Geosciences: Measurement of rock fragmentation

2000-2005: Pre-doc researcher at UPM-ETSI Minas.

- Accomplishment of energy controlled blasting for less fines production in aggregate and industrial minerals industry.
- Development of practical procedures for the measurement of fragmentation by image analysis.
- Investigation of the accuracy of fragment size distributions from image analysis

1999 (3 months): Sishen Iron Ore Mine (Kumba Resources LTD, South Africa). Mining Engineer Internship.

EDUCATION

Ph. D., 2005, Blasting Technology, UPM, Dissertation title: Experimental analysis of fragmentation, vibration and rock movement in open pit blasting (Supervised by Prof. José A. Sanchidrián).

Mining Engineer, 2000, Mining and Mineral Engineering, UPM.

PAPERS IN MAJOR INTERNATIONAL (JCR) JOURNALS (Last six years)

1. Segarra, P., Sanchidrián, J. A., Castedo, R., & del Castillo, I. (2017). Coupling of blasting seismographs to rock and its effectiveness for horizontal ground motion. *International Journal of Rock Mechanics and Mining Sciences*, 92, 81-90.

2. Navarro, J., Sanchidrián, J. A., Segarra, P., Castedo, R., Paredes, C., & López, L. M. (2018). On the mutual relations of drill monitoring variables and the drill control system in tunneling operations. *Tunnelling and Underground Space Technology*, 72, 294-304.

3. Segarra, P., Sanchidrián, J. A., Navarro, J., & Castedo, R. (2018). The Fragmentation Energy-Fan Model in Quarry Blasts. *Rock Mechanics and Rock Engineering*, 51(7), 2175-2190.

4. Costamagna, E., Oggeri, C., Segarra, P., Castedo, R., & Navarro, J. (2018). Assessment of contour profile quality in D&B tunnelling. *Tunnelling and Underground Space Technology*, 75, 67-80.

5. Navarro, J., Sanchidrián, J. A., Segarra, P., Castedo, R., Costamagna, E., & López, L. M. (2018). Detection of potential overbreak zones in tunnel blasting from MWD data. *Tunnelling and Underground Space Technology*, 82, 504-516.

6. Castedo, R., Natale, M., López, L. M., Sanchidrián, J. A., Santos, A. P., Navarro, J., & Segarra, P. (2018). Estimation of Jones-Wilkins-Lee parameters of emulsion explosives using cylinder tests and their numerical validation. *International Journal of Rock Mechanics and Mining Sciences*, 112, 290-301.

7. Navarro, J., Segarra, P., Sanchidrián, J. A., Castedo, R., & López, L. M. (2019). Assessment of drilling deviations in underground operations. *Tunnelling and Underground Space Technology*, 83, 254-261.

8. López, L. M., Castedo, R., Chiquito, M., Segarra, P., Sanchidrián, J. A., Santos, A. P., & Navarro, J. (2019). Post-blast Non-destructive Damage Assessment on Full-scale Structural Elements. *Journal of Nondestructive Evaluation*, 38(1), 30.

9. Navarro, J., Schunnesson, H., Ghosh, R., Segarra, P., Johansson, D., & Sanchidrián, J. Á. (2019). Application of drill-monitoring for chargeability assessment in sublevel caving. *International Journal of Rock Mechanics and Mining Sciences,* 119, 180-192.

10. Navarro, J., Seidl, T., Hartlieb, P., Sanchidrián, J. A., Segarra, P., Couceiro, P., Schimek, P., Godoy, C. (2021). Blastability and Ore Grade Assessment from Drill Monitoring for Open Pit Applications. *Rock Mechanics and Rock Engineering*, 54 (4), 3209–3228.

11. Lai, F., Beylot, A., Navarro, R., Schimek, P., Hartlieb, P., Johansson, D., Segarra, P., Amor, C., & Villeneuve, J. (2021). The environmental performance of mining operations: Comparison of alternative mining solutions in a life cycle perspective. *Journal of Cleaner Production*, 315, 128030.

12. Gómez, S., Sanchidrián, J. A., & Segarra, P. (2020). Near-field vibration from blasting and rock damage prediction with a full-field solution. *International Journal of Rock Mechanics and Mining Sciences*, 134, 104357.

13. Laguillo, M., Segarra, P., Sanchidrián, J. A., & Beitia, F (2022). A novel borehole surveying system for underground mining: Design and performance assessment. *Measurement* 194 (2022): 111021.

14. Sanchidrián, J. A., Segarra, P., Ouchterlony, F., & Gómez, S. (2022). The Influential Role of Powder Factor vs. Delay in Full-Scale Blasting: A Perspective Through the Fragment Size-Energy Fan. Rock Mechanics and Rock Engineering, 55(7), 4209 – 4236.

15. Bernardini, M., Paredes, C., Sanchidrián, J. A., Segarra, P., & Gómez, S. (2022). On the Influence of Sampling Scale on the In Situ Block Size Distribution. Rock Mechanics and Rock Engineering, 55(9), 5723-5738.

PAPERS IN INTERNATIONAL PEER-REVIEWED CONFERENCES (last five years)

1. Navarro, J. Segarra, P., Sanchidrian, J.A., Castedo, R., Perez Fortes, A.P, Natale, M., López, L.M. (2018). Application of an in-house MWD system for quarry blasting. 12th International Symposium on Rock Fragmentation by Blasting—*Fragblast 12*, 11–13 June, Luleå.

2. Segarra, P., Sanchidrian, del Castillo, I., J.A., Castedo, R., Lopez, L.M, Navarro, J. (2018). Do different standards for blasting seismographs mean different accuracy? 12th International Symposium on Rock Fragmentation by Blasting—*Fragblast 12*, 11–13 June, Luleå.

3. Natale, M., Castedo, R., Lopez, L.M., Sanchidrian, J.A., Segarra, P., Santos, T., Navarro, J. (2018). Comparison between coupled SPH-FEM numerical model of a single hole blast and experimental test. 12th International Symposium on Rock Fragmentation by Blasting—*Fragblast 12* , 11–13 June, Luleå.

4. P. Segarra, J.A. Sanchidrián, J. Navarro, R. Castedo. (2019) Powder factor analysis of quarry blasts through the fragmentation-energy fan concept. *45th Annual Conference on Explosives and Blasting Technique*. 27–30 January, Nashville. International Society of Explosives Engineers.

5. J. Navarro, H. Schunnesson, P. Segarra, J.A Sanchidrián, D. Johansson, R. Castedo (2019) Application of drill-monitoring for chargeability assessment in sublevel caving. *10th World Conference on Explosives and Blasting*. 15–17 September, Helsinki. European Federation of Explosives Engineers.

6. P. Segarra, J.A. Sanchidrián, A.P. Perez, J. Navarro, C. Paredes (2019) Joints mapping with commercial monitoring tools–techniques, results and lessons. *10th World Conference on Explosives and Blasting*. 15–17 September, Helsinki. European Federation of Explosives Engineers.

7. M. Bermejo, J. Navarro, J.A Sanchidrián, P. Segarra, R. Castedo (2019) SPH modeling: calibration from bench face movement data. *10th World Conference on Explosives and Blasting*. 15–17 September, Helsinki. European Federation of Explosives Engineers.

8. C. Godoy, J. Navarro, P. Couceiro, J.A. Sanchidrián, P. Segarra (2020) Assessment of Post-blast Damage Zones in Tunneling Operations Through MWD and Machine Learning. *46th Annual Conference on Explosives and Blasting Technique*, 26–29 January, Denver, Colorado. International Society of Explosives Engineering.

9. J. Navarro, P. Couceiro, C. Godoy, J.A. Sanchidrián, P. Segarra, H. Schunnesson (2020) Application of Geostatistical Tools in Measurement While Drilling to Assess Geotechnical Rock Conditions in Sublevel Caving. *46th Annual Conference on Explosives and Blasting Technique*, 26–29 January, Denver, Colorado. International Society of Explosives Engineering.

10. P. Segarra, J.A. Sanchidrián, M. Bernardini, S. Gómez, A.P Pérez-Fortes, C. Paredes (2020, November). Discontinuity Mapping with Photogrammetry and Televiewer for Blastability Assessment. *ISRM International Symposium-EUROCK 2020- Hard Rock Engineering*. 14-19 June, Trondheim, Norway. International Society for Rock Mechanics and Rock Engineering and Norwegian Group for Rock Mechanics. (ISBN: 978-82-8208-072-9).

11. P. Segarra, J.A. Sanchidrián, M. Bernardini, S. Gómez (2020). Joint factor assessment from photogrammetry of the highwall faces and televiewer logging of blastholes. *2020 Silk Road International Conference on the cooperation and integration of Industry, Education, Research and Application*. (2020. Xi'an (remoto), China). KEYNOTE LECTURER

12. S. Gómez, J.A. Sanchidrián, P. Segarra (2020). Frequency attenuation of seismic waves from blasting using a full-field solution. *XVI International Forum-Contest of Students and Young Researchers "Topical Issues of Rational Use of Natural Resources"* (2020. San Petersburgo (remoto), Rusia).

13. P. Segarra, J.A. Sanchidrián, J. Navarro, P. Couceiro, T. Seidl, P. Hartlieb, P. Schimek (2021) Rock Mass Characterization Through Drill Monitoring. *10th International Drilling and Blasting Symposium* (pp. 17-29). 25–26 November, Antalya, Turkey. Chamber of Mining Engineers of Turkey. ED. Armoni Basim (ISBN: 978-605-01-1440-9), p. 17-29. INVITED SPEAKER.

14. S. Gómez, J.A. Sanchidrián, P. Segarra (2022). Damage to Rock: Near Field Seismic Models Revisited. *48th Annual Conference on Explosives and Blasting Technique*, 28 - Feb. 2, Las Vegas. International Society of Explosives Engineering.

15. J. Navarro, P. Couceiro, T. Seidl, P. Hartlieb, J.A. Sanchidrián, P. Segarra, P. Schimek (2022) On the Use of Drill Monitoring System to Assess a Blastability Index and Ore Grade Characterization for

Open Pit Applications. *48th Annual Conference on Explosives and Blasting Technique*, 28 - Feb. 2, Las Vegas. International Society of Explosives Engineering. PAPER OF THE YEAR.

16. J. Navarro, P. Couceiro, C. Rodriguez, J.A. Sanchidrián, P. Segarra, T. Seidl, P. Hartlieb, P. Schimek (2022) Blastability Index to Assess Fragmentation from Drill Monitoring Data in Bench Blasting. *48th Annual Conference on Explosives and Blasting Technique*, 28 - Feb. 2, Las Vegas. International Society of Explosives Engineering.

More information on Journal and Conf. Papers:
http://scholar.google.es/citations?view_op=search_authors&mauthors=pablo+segarra

5. CONSULTING ACTIVITES OR INDUSTRIAL RESEARCH

Consulting activities (last years)

1. Registro de onda de choque en ensayos de explosivos de fabricación casera base clorato de potasio. *Contracting entity*: OTAN - Counter Improvised Explosive Devices Center of Excellence (C-IED CoE). Contract No. P1506490020. 1 month 2015.
2. Control de vibraciones en demolición por voladura de chimenea n° 1 y 2 de Central Térmica de Iberdrola. *Contracting entity*: Voladuras y Demoliciones S.A. 2015.
3. Estudio de sistemas de corte por explosivos para estructura metálica de caldera en Central Térmica - ACECA. *Contracting entity*: UTE UFESA-TAMOIN. 2015.
4. Consultoría para estudio comparativo Rioflex vs Emulsión. *Contracting entity*: MAXAM. 2021.

Industrial research (last years)

1. TÚÑEL: Investigación para la mejora competitiva del ciclo de perforación y voladura en minería y obras subterráneas, mediante la concepción de nuevas técnicas de ingeniería, explosivos, prototipos y herramientas avanzadas. Funded by MAXAM as outsourcing of TUÑEL Project funded by Centre for the Development of Industrial Technology (CDTI) – Fondos tecnológicos – Proyectos CIEN. Contract No. PCD1606490008. 2015– 19.
2. SLIM-Sustainable Low Impact Mining solution for exploitation of small mineral deposits based on advanced rock blasting and environmental technologies. Funded by European Commission, Horizon 2020 research and innovation programme, Contract No. 730294. 2016 – 2020.
3. Desarrollo de kit de sensorización para perforación eficiente, sostenible y segura en minería y obras subterráneas (DRILLENSE). Funded by Ministerio de Ciencia, Innovación y Universidades and Fondo Europeo de Desarrollo Regional (Retos Colaboración 2017), Contract No. RTC-2017-6085-3. 2018– 2019.
4. illuMINEation – Bright concepts for a safe and sustainable digital mining future. European Commission. Call H2020-SC5-2018-2019-2020 / H2020-SC5-2019-TwoStage. Grant Agreement no. 869379. 2020– 2023.
5. DIGIECOQUARRY –Innovative Digital Sustainable Aggregates Systems. Funded by European Union's Horizon 2020 research and innovation program, Contract no. 101003750.2021– 2025.

OTHER ACHIEVEMENTS

periods of recognized research (Agencia Nacional de Evaluación de la Calidad y Acreditación):.

2022 Paper of the Year Award- "Blastability Index to Assess Fragmentation from Drill Monitoring Data in Bench Blasting", International Society of Explosives Engineer.

2015 Paper of the Year Award- "Rock-to-sensor transmissibility- Part 2", International Society of Explosives Engineer.

Funding by International Science and Technology Center- ISTC to lecture at the International WorkShop Advanced Technologies of drilling and blasting operations in Kyrgyz Republic (2006)

Award for Excelent Ph. D Thesis in Mining, 2005, Sociedad Hullera Vasco Leonesa- Real Academia Doctores de España.

PROFFESIONAL AND RELATED ACTIVITIES

Peer review of scientific papers for journals like Rock Mechanics and Rock Engineering; International Journal of Rock Mechanics and Mining Sciences.

Member of Program Committee at the 9th International Symposia on Rock Fragmentation by Blasting.

Member of Technical Committee of 9th, 10th and 11th International Symposia on Rock Fragmentation by Blasting.

Member of International Society of Explosives Engineers and of International Society of Rock Mechanics (through the Spanish Society of Rock Mechanics).

Madrid, February 10th, 2023

Pablo Segarra