Junhyeok Park

Ph.D. Candidate at the University of Arizona

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RESEARCH INTERESTS

- Dynamic Rock Fracturing and Fragmentation
- Computer Vision and Machine Learning Application on Geotechnical Area
- Rockfall Analysis and Slope Stability Monitoring system
- Mine-to-Mill Optimization and Ore Tracking
- Dust Control

PUBLICATIONS

[JOURNAL ARTICLES]

2019 **TAILINGS STORAGE FACILITY(TSF) DUST CONTROL USING BIOCOMPATIBLE POLYMERS**
Junhyeok Park, Kwangmin Kim, Taehee Lee, Minkyu Kim
Mining, Metallurgy, & Exploration Journal (MMEX)

2019 **QUANTIFICATION OF ROCK MASS WEATHERING USING SPECTRAL IMAGING**
Junhyeok Park, Kwangmin Kim
Journal of the Southern African Institute of Mining and Metallurgy (SAIMM)

2019 **USE OF DRILLING PERFORMANCE TO IMPROVE ROCK-BREAKAGE EFFICIENCIES: A PART OF MINE-TO-MILL OPTIMIZATION STUDIES IN A HARD-ROCK MINE**
Junhyeok Park, Kwangmin Kim
International Journal of Mining Science and Technology

2019 **LIQUID AMPHIPHILIC POLYMER FOR EFFECTIVE AIRBORNE DUST SUPPRESSION**
Taehee Lee, Junhyeok Park, David Knoff, Kwangmin Kim, Minkyu Kim
RSC (Royal Society of Chemistry) Advnaces

2019 **ESTIMATION OF FINES GENERATION IN BLASTING USING DYNAMIC ROCK PROPERTIES AND NEAR-FIELD PPV DAMAGE MODEL**
Junhyeok Park, Kwangmin Kim
Mining, Metallurgy, & Exploration Journal (MMEX) - Under Review

[CONFERENCES]

2020 **A PORTABLE AI-BASED SOLUTION FOR FRAGMENTATION ANALYSIS IN MINING**
Nathalie Risso, Junhyeok Park, Jack Lundin
2020 Society for Mining, Metallurgy, and Exploration (SME) Annual Meeting, Phoenix, AZ

2019 **CHARACTERIZATION OF COAL FINE AND DUST GENERATION UNDER DYNAMIC LOADINGS**
Junhyeok Park, Nathalie Risso, Kwangmin Kim
2019 Society for Mining, Metallurgy, and Exploration (SME) Arizona Conference, Tucson, AZ

2019 **DUST CONTROL OF TAILINGS STORAGE FACILITIES (TSF) USING BIOCOMPATIBLE POLYMERS**
Junhyeok Park, Kwangmin Kim, Taehee Lee, Minkyu Kim
2019 Society for Mining, Metallurgy, and Exploration (SME) Annual Meeting, Denver, CO

2017 **MACHINE LEARNING STUDY FOR IMPACT OF FINES ON SAG MILL**
Junhyeok Park, Nathalie Risso, Kwangmin Kim
2017 Society for Mining, Metallurgy, and Exploration (SME) Arizona Conference, Tucson, AZ

2016 **CREATING A DIGITAL OUTCROP MODEL BY USING HYPER-SPECTROMETRY AND TERRESTRIAL LIDAR**
Junhyeok Park, Melissa Bates, Yongsik Jeong, John Kemeny, Kwangmin Kim
2016 American Rock Mechanics Association Conference (ARMA), Houston, TX

2015 **DETERMINATION OF ROCK COMMINUTION CHARACTERISTICS USING PENETRATION RATES FOR BLASTING DILL HOLES**
Junhyeok Park, Kwangmin Kim
2015 Society for Mining, Metallurgy, and Exploration (SME) Arizona Conference, Tucson, AZ

EDUCATION

Aug 2016 – Current **UNIVERSITY OF ARIZONA**, AZ, USA
Doctor of Philosophy (Ph.D.) Expected Graduation: May 2020
Major: Department of Mining and Geological Engineering (GPA 3.98/4.0)
Minor: Electrical Engineering
Dissertation Title: Technological and Environmental Applications for Sustainable Mine Operations
Advisor: Dr. Kwangmin Kim

Aug 2014 – Aug 2016 **UNIVERSITY OF ARIZONA**, AZ, USA
Master of Science (M.Sc.)
Major: Mining and Geological Engineering
Thesis Title: Estimation of Rock Comminution Characteristics by Using Drill Penetration Rates

Mar 2008 – Aug 2014 **SEOUL NATIONAL UNIVERSITY**, Seoul, Korea
Bachelor of Science (B.Sc.)
Major: Energy and Resources Engineering

INDUSTRIAL EXPERIENCE

Oct 2019 – May 2020 **TECHNOLOGY CENTER – FREEPORT MCMORAN**, Oro Valley, AZ, USA
Strategic Mine Planning Part-time Intern **(http://www.freeportinarizona.com/)**
- Constructed an interactive visualization system using Power BI for mine blasting big data handling.
- Implemented a rockfall simulation for Morenci mine using Hy-stone software.
- Evaluated new slope audit software before applying to the site-level.

May 2019 – Aug 2019 **SAFFORD OPERATION – FREEPORT MCMORAN**, Safford, AZ, USA
Geomechanical Engineering Intern **(http://www.freeportinarizona.com/)**
- Established a 3D site-specific slope damage model induced by blast vibration using Minesight
- Performed slope audit based on digital terrain model and interpreted a hazard

May 2018 – Aug 2018 **MORENCI OPERATION – FREEPORT MCMORAN**, Morenci, AZ, USA
Geomechanical Engineering Intern **(http://www.freeportinarizona.com/)**
- Established an integrative platform for blasting evaluation as a part of slope steepening
- Modified and upgraded the Prism data collection system (Leica & Canary)

May 2017 – Aug 2017 **CLIMAX MOLYBDENUM – FREEPORT MCMORAN**, Leadville, CO, USA
Geomechanical Engineering Intern **(http://www.climaxmolybdenum.com/)**
- Slope monitoring: Geo-radar (IBIS), Prism systems, and cell mapping
- Developed the VBA software for rock strength identification from drilling data

Jan 2014 – Feb 2014 **GEOGENY CONSULTANTS**, Seoul, Korea
Project Management Intern **(http://www.geogeny.biz/)**
- Participated the archiving as a main-author of “Iron ore development guide” encompassing from geology to market

Jan 2010 – Feb 2010 **MITSUBISHI CORPORATION,** Tokyo, Japan
Energy & Metal Division Intern **(http://www.mitsubishicorp.com/)**
- Comprehended whole processes of resources trading and investment

Jan 2010 – Feb 2010 **KOREA RESEOURCES CORPORATION,** Seoul, Korea
Coal Division Intern (**http://www.kores.or.kr**)
- Analyzed the validity of Mongolian Coal mining Project
- Estimated feasibility of the project by using IRR method and NPV

RESEARCH PROJECT

Sep 2017 – Aug 2018 **BIO-COMPATIBLE POLYMER APPLICATION ON TAILING DUST CONTROL**
University of Arizona Tech Launch, AZ
- Found the applicability of biocompatible polymer as a dust suppressant on tailings
- Conducted wind blow tests in laboratory scale and field scale to measure PM10/PM2.5 dust

May 2015 – Aug 2015 **BLAST FRAGMENTATION OPTIMIZATION**
University of Arizona & Drake Cement, Paulden, AZ
- Conducted fragmentation analysis and Lab tests (BR and BWI test)
- Completed a baseline research of mine to mill optimization

AWARDS & SCHOLARSHIPS

Jan 2019 **RD CALL MEMORIAL SCHOLARSHIP**

Oct 2017 **SCHOLARSHIP FROM SME TUCSON SECTION**
SME Tucson Section, Tucson, USA

May 2017 **OUTSTANDING GRADUATE TEACHING ASSISTANT AWARD**
College of Engineering, University of Arizona

Mar 2015 **CAMPUS ORE RESERVE ESTIMATION ARENA**
Korea Resource Corporation, South Korea
Grand Prize
- Participated mineral resources/reserve estimation competition
- Performed orebody modeling ordinary Kriging using Minesight software

LEADERSHIP EXPERIENCE

Jan 2017 – May 2019 **U OF ARIZONA MINING ENGINEERING GRADUATE STUDENT CHAPTER**
President
- Organized the grad student poster session in SME Arizona Conference
- Encouraged research environment and cooperation among graduate students

Sep 2014 – May 2018 **U OF ARIZONA KOREAN GRADUATE STUDENT ASSOCIATION**
President
- Organized social networks and support newcomers
- Supported tax documentation for the students

MILITERY SERVICE

Apr 2011 – Apr 2013 **KOREAN AIR-FORCE,** Yangju, Gyeonggi, Korea
Fire Control Operator at 8968 Air Defense Artillery
- Operated and maintained surface to air missiles and radar (Hawk missile system)
- Served as a squad leader for 4 months
- Service Number: 11-70005055

CERTIFICATIONS

Sep 2019 **ENGINEER-IN-TRAINING (EIT),** Arizona,
- Fundamental Engineer (FE) passed
- Verifiable link

PROFESSIONAL SOCIETIES & ACTIVITIES

Aug 2019 – Present **SOCIETY OF MINING, METALLURGY AND EXPLORATION (SME)**

SKILLS

- Geotechnical Analysis, Slope Stability Analysis: Canary system with prism networks, IDS radar & IBIS
- Lab test: UCS, BWI, and SHPB (Split Hopkinson Pressure Bar)
- Digital Image processing and Signal processing, Control system, Machine learning
- Blast design and fragmentation analysis with **SHOTPLUS (Orica)** and **SPLIT SYSTEM**
- Mining simulation with **ARENA,** and **SIMULINK** software (intermediate)
- **MINESIGHT** (Advanced, Teaching Assistant for lab session at U of A for 5 years)
- Hyperspectral imaging with **ERDAS/ENVI** software, LiDAR scanning (Advanced)
- **PYTHON** (Used library: OpenCV, Tensorflow, etc.)**, MATLAB**, **VBA** (Advanced)
- Microsoft Excel Power Pivot, Power view, and Power BI (Advanced)
- **ArcGIS** product (Intermediate)

REFERENCE

- **Dr. Kwangmin Kim**
  Professor in Mining and Geological Engineering, University of Arizona, USA
  Tel: +1 520 626 5977 Email: kimkm@email.arizona.edu