



ALI SOOFASTAEI

PROFILE

"An expert to create value and
improve lives through sustainable
and responsible engineering"

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CONTACT DETAILS

Address: 8 Kagoola Close, Chapel Hill, Brisbane, QLD 4069, Australia

Telephone: 0061 7 3157 3281

Mobile: 0061 4 2212 5935

Emails: ali@soofastaei.net

Websites:

<https://www.soofastaei.net/>

<https://www.soofastaei-business.com/>

<https://www.soofastaei-publications.com/>

<https://www.soofastaei-educations.com/>



LIFE CHART



EDUCATIONS



BUSINESS



CONFRENCES



PUBLICATIONS



AWARDS



PATENTS

1999-2004


- First-rank graduate
- Ranked first in National Computer and National Mathematics Olympiad
- Ranked second in National Physics Olympiad



2

International Conferences



6

Journal Papers



Bachelor of Engineering

2005-2008


- Certificate of the top researcher in the field of energy management
- First-rank graduate



4

International Conferences



2

Journal Papers



Research and Development Manager

SHELL



Master of Engineering

2008-2012


- top lecturer
- First-rank graduate
- International Scholarship
- National TopInventor



7

International Conferences



1

Journal Papers

Research and Development Manager
SHELL

- The IMTL Ring Dosimeter
- I&M Filter Holders
- BEC Indicator
- ESAM

2012-2015


- School of Engineering Award
- CRCMining Award
- CRCMining Research Higher Degree



5

International Conferences



2

Journal Papers

Project Manager
CRC Mining

Doctor of Philosophy

2015-2017


- Australia to USA Fellowship
- Graduate School International Award



4

International Conferences

9
2Journal Papers
Chapter BooksInnovation Director
Mining3

- CRC Truck Bunching

2017-2024


- FCM Haul Truck
- Mineral Freight Rate Prediction



13

International Conferences

11
6
1Journal Papers
Books
Chapter Books

- AI Program Leader
VALE

- Advacned Analytics and Applied AI Projects Leader
Newmont



Dr. Ali Soofastaei is a global artificial intelligence (AI) industrial projects leader, an educational programs instructor, international keynote speaker, academic editor, and professional, scientific author.

His extensive practical experience in the industry has equipped him to work in several industries, including oil and gas (Royal Dutch Shell); steel (Danieli); and mining (BHP, Rio Tinto, Anglo American, Vale, and Newmont).

He established the Soofastaei Institute to develop innovative applications of advanced analytics and AI to tackle business challenges in different industries. This institute covers a variety of businesses projects, educational programs, and publications in applied AI for prediction, optimization, and making decisions for multidimensional systems.

Dr Soofastaei has been involved in industrial research and development projects in several industries, including oil and gas (Royal Dutch Shell); steel (Danieli); and mining (BHP, Rio Tinto, Anglo American, Vale, and Newmont). His extensive practical experience in the industry has equipped him to work with complex industrial problems in highly technical and multi-disciplinary teams. Currently, Ali is leading the Soofastaei-Businesses, an organization focused on digital transformation, practical innovations, and value chain improvement by applying integrated AI solutions. For more information, please see www.soofastaei-business.com.

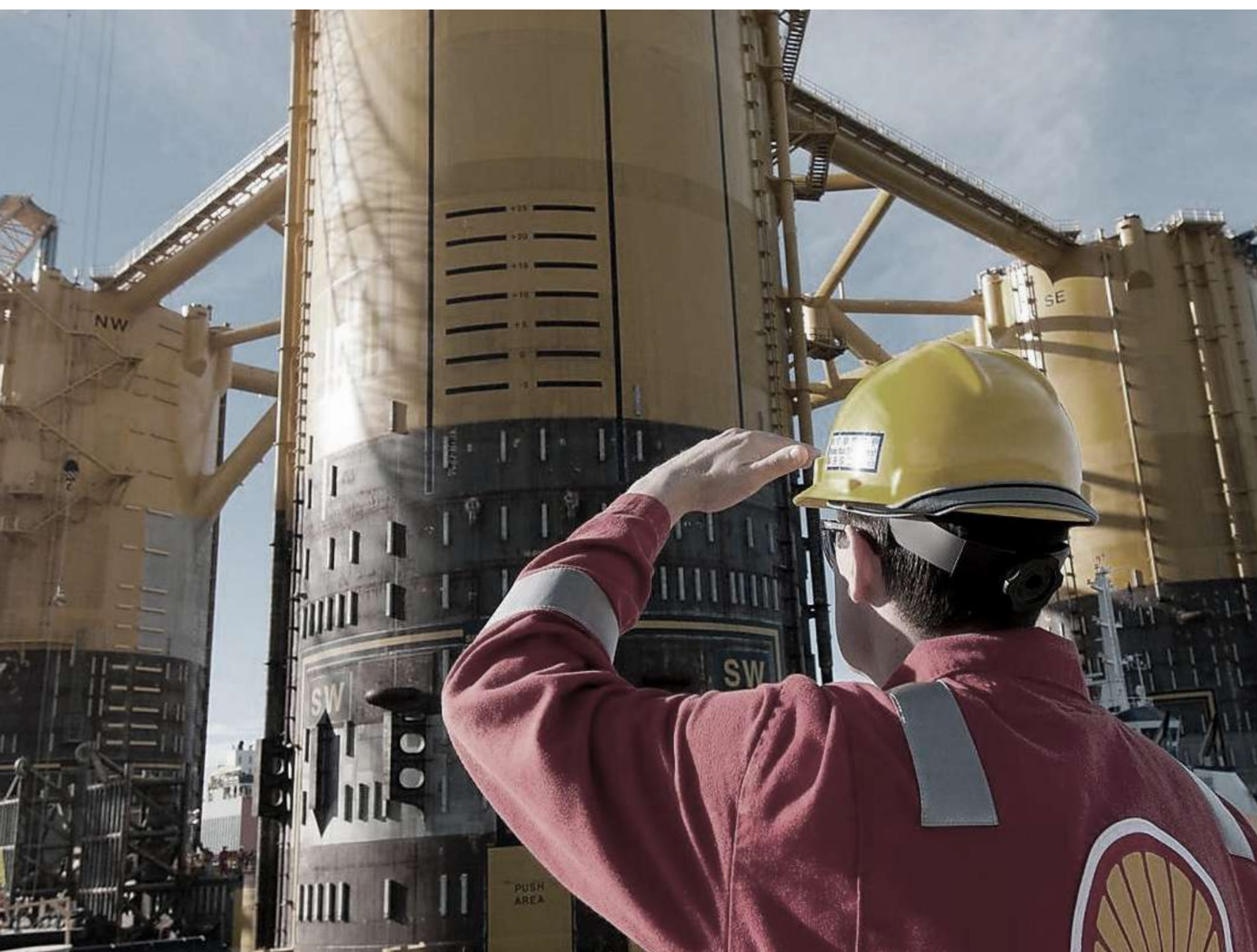
Ali completed his Ph.D. and Postdoctoral Research Fellow at the University of Queensland, Australia, in the field of AI applications in mining engineering, where he led a revolution in the use of Deep Learning and AI methods to increase energy efficiency, reduce operation and maintenance costs, and reduce greenhouse gas emissions in surface mines. In the past 15 years, he has provided practical guidance to postgraduate students in prestigious universities worldwide as a principal industrial advisor. Recently, he founded an educational organization named Soofastaei-Educations. This establishment facilitates and presents educational short-term, medium-term, and long-term courses for industrial companies and universities as Bootcamp or semester programs. For more information, please see www.soofastaei-educations.com.

Dr. Soofastaei has been known as an internationally famous keynote speaker in advanced applied analytics and AI solutions to improve safety, productivity, energy efficiency, and decrease total product costs. He also directs a publication institute called Soofastaei-Publications to publish scientific journal papers and academic reference books with impressive publishers such as Springer, McGraw Hill, CRC Press, Lambert, and IntechOpen. For more information, please see www.soofastaei-publications.com.

Leading actively industrial analytical based projects in giant industrial companies, designing and presenting innovative educational programs, keynote speaking in important conferences around the world, having more than one hundred published papers, books, and technical documents, and working with prestigious publishers to provide the scientific resources has made him a pioneer leader in creating a digital revolution in industry 4.0.



INDUSTRIAL WORK EXPERIENCES



1**Date and Duration of Employment:****From 01-July-2023 till now****Organization Name: Newmont**

Newmont Corporation, an esteemed gold mining enterprise headquartered in Greenwood Village, Colorado, United States, stands as the preeminent gold mining entity on a global scale. Established in 1921, the corporation boasts an extensive portfolio of gold mining operations in various regions, including United States, Canada, Mexico, the Dominican Republic, Australia, Ghana, Argentina, Peru, and Suriname.

**Title of Position: Advanced Analytics and Applied AI Projects Leader****Brief Description of Activities:**

- ❑ Leading the development and implementation of advanced analytics and AI-driven projects to optimize mining operations and increase efficiency.
- ❑ Collaborating with cross-functional teams to identify opportunities for leveraging analytics and AI in solving complex business challenges.
- ❑ Overseeing the entire lifecycle of analytics and AI projects, from conceptualization and data collection to model development, validation, and deployment.
- ❑ Ensuring the application of best practices in data science, machine learning, and AI to drive innovative solutions within the mining sector.
- ❑ Managing a team of data scientists, analysts, and AI specialists, providing guidance and mentorship to foster skill development and professional growth.
- ❑ Engaging with stakeholders across the organization to communicate insights, recommendations, and the business value derived from analytics and AI initiatives.
- ❑ Staying abreast of industry trends, emerging technologies, and advancements in analytics and AI to maintain a competitive edge and drive continuous improvement.

2**Date and Duration of Employment:**

From 01-January-2017 till 30-June-2023; (5.5 Years)

Organization Name: VALE

Vale is one of the worlds' largest mining companies, working with a passion for transforming natural resources into prosperity. Vale is the largest producer of iron ore and nickel in the world. Vale also produces manganese, ferroalloys, copper, bauxite, potash, kaolin, and cobalt. The company also operates nine hydroelectricity plants and an extensive network of railroads, ships, and ports to transport its products.

**Title of Position: AI Program Leader****Brief Description of Activities:**

- ❑ Lead innovative AI programs to develop practical solutions for industrial problems;
- ❑ Conduct advanced data analysis and highly intricate designs of predictive, optimization, and making decision algorithms;
- ❑ Develop Artificial Intelligence-based applications and software packages;
- ❑ Develop equipment system models to predict availability and capacity and optimize models;
- ❑ Develop condition-based risk models to assess remaining life in components;
- ❑ Ensure models incorporate adequate statistical considerations and validate outcome;
- ❑ Evaluate and select the IT partners such as IBM, Deloitte, Accenture, and Microsoft to complete the AI projects; and
- ❑ Manage global projects' team to develop and sustain the AI products.

3**Date and Duration of Employment:****From 01-January-2016 to 31-December-2016; (1 Year)****Organization Name: Mining3**

Mining3 is an industry-driven, global leader in mining research and innovation. This company develops and delivers breakthrough innovations and technologies that transform the mining industry's productivity, sustainability, and safety. Mining3 partners with universities and mining companies to collectively drive innovative development. These developments involve new and modified mining methods and processes, new mining technology, and equipment.

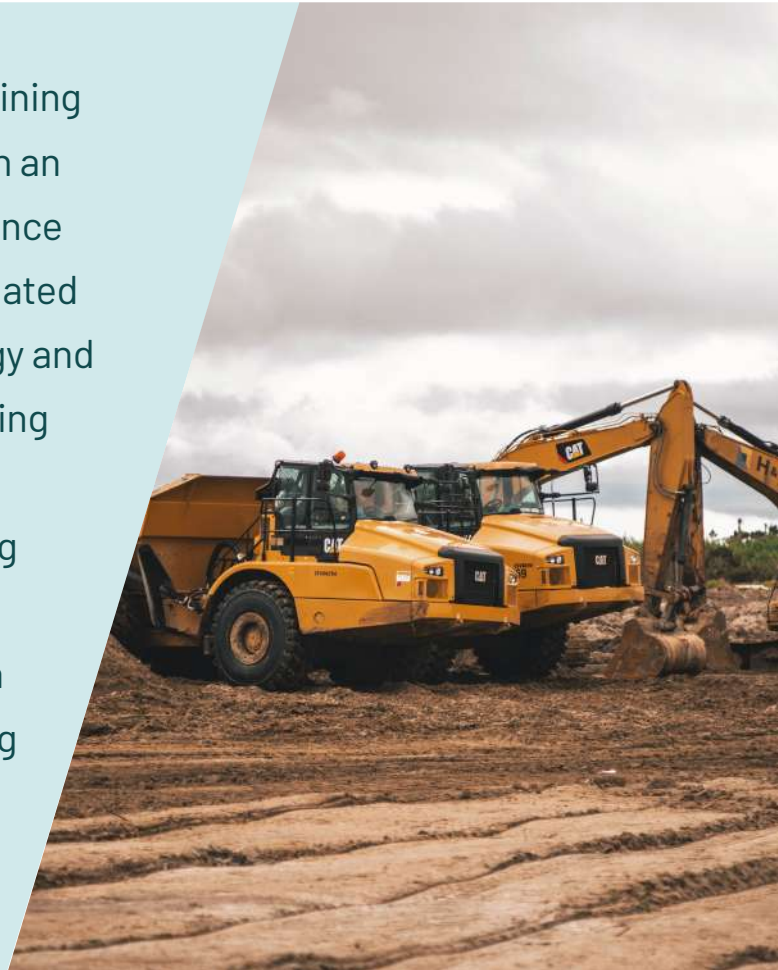
**Title of Position: Innovation Director****Brief Description of Activities:**

- Design experiments, test hypotheses, and build models;
- Conduct advanced data analysis and highly complex designs algorithm;
- Apply advanced statistical and predictive modeling techniques to build, maintain, and improve multiple real-time decision systems;
- Lead the R&D and innovation groups; and
- Lead the Digital Transformation program; and Design and present innovative AI-based solutions for business problems.

4

Date and Duration of Employment:**From 01-July-2012 to 31-December-2015; (3.5 Years)****Organization Name: CRC Mining**

CRCMining was the pre-eminent mining research organization globally, with an international reputation for excellence in mining-focused research and related industry outcomes. The CRC Energy and Power Program focused on improving energy efficiency, reducing of Greenhouse Gas emissions by using computer models, and increased utilization of renewable energies in mine environments. The CRCMining company name was changed to Mining3 in 2016.

**Title of Position: Project Manager****Brief Description of Activities:**

- Complete an AI application to predict and minimize haul trucks' fuel consumption;
- Develop a Discrete-Event model to simulate the effect of payload variance on truck bunching;
- Develop new methods to improve energy efficiency in surface mines; and
- Develop an innovative machine learning algorithm for excavators' predictive maintenance.

5**Date and Duration of Employment:****From 03-April-2004 to 30-Jun-2012; (8 Years)****Organization Name: SHELL**

Shell is an international energy company with expertise in the exploration, production, refining and marketing of oil and natural gas across more than 70 countries. Shell is the second largest investor-owned oil and gas company in the world by revenue.

**Title of Position: Research and Development Projects' Manager****Brief Description of Activities:**

- Develop an application to audit and manage energy use in administrative and industrial buildings to optimize energy consumption;
- Create an innovative algorithm to audit energy consumption by mechanical and electrical equipment;
- Design and supervise manufacturing the mechanical equipment and facilities;
- Manage engineering projects in different phases of equipment design, purchase manufacturing, and installation;
- Design and deliver training courses for oil refineries experts and managers; and
- Design the guidelines for auditing energy consumption and improving energy efficiency in shell's industrial buildings.



ACADEMIC BACKGROUND



1

Doctor of Philosophy

Major: Information Technology, Mechanical and Mining Engineering, (2012-2015)

Thesis: Development of AI models to Improve the Energy Efficiency of Haul Trucks in Surface Mines

Ph.D. Research Project: Truck haulage is responsible for the majority of costs in a surface mining operation. Diesel fuel, which is costly and has a significant environmental footprint, is used as an energy source for trucks in surface mines. Reducing diesel fuel consumption would lead to a reduction in haulage cost and greenhouse gas emissions. Determining fuel consumption is complex and requires multiple parameters, including the mine fleet, truck, fuel, climate, and road conditions as input. Artificial Intelligence is used to simulate the complex relationships between the input parameters affecting truck fuel consumption. This technique also optimizes the input parameters to minimize fuel consumption without losing productivity or further capital expenditure for a specific surface mining operation. A comprehensive analytical framework was developed to determine the opportunities for minimizing truck fuel consumption.

Determining fuel consumption is complex and requires multiple parameters, including the mine fleet, truck, fuel, climate, and road conditions as input. Artificial Intelligence is used to simulate the complex relationships between the input parameters affecting truck fuel consumption.



The first stage of the developed analytical framework includes the designing of an Artificial Neural Network model to establish the relationship between truck fuel consumption and payload, truck speed, and total resistance. This model is trained and tested using real data collected from large surface mines in Australia and the USA. As a result, a fitness function for the haul truck fuel consumption was successfully generated. This fitness function was then used in the second stage of the analytical framework to develop a deep learning algorithm based on a novel multi-objective Genetic Algorithm. This algorithm aims to estimate the optimum values of the three effective parameters to reduce diesel fuel consumption.



In the first stage an ANN model was used to establish relationship between truck fuel consumption and payload, truck speed, and total resistance by real data collected from large surface mines in Australia and the USA.

In the second stage a multi-objective Genetic Algorithm was used to develop a DL algorithm to estimate the optimum values of the three effective parameters to reduce diesel fuel consumption.

The following studies were also conducted to enhance the analysis of haul truck fuel consumption.

1. A comprehensive investigation of loading variance influence on fuel consumption and gas emissions in mine haulage operation was carried out.
2. A discrete-event model was developed to simulate the effect of payload variance on truck bunching, cycle time, and hauled mine materials.
3. The influence of rolling resistance on haul truck fuel consumption in surface mines was investigated.

2 Master of Engineering

Major: Mechanical and Industrial Engineering, (2006-2008)

Thesis: Energy Consumption Improvement in Residential Buildings by Value Engineering

Master Research Project: A practical method based on value engineering was developed to reduce energy consumption in residential buildings. Moreover, this new methodology considers all different parameters and gives value to them merely but comprehensively. Then, it presents the most valuable offers for reducing energy consumption in residential buildings according to the computer software developed in this project. Consequently, based on the developed value engineering model, a green building was built with the lowest energy consumption rate as a practical example of using the completed model and software in the building industry.

3 Bachelor of Engineering

Major: Mechanical Engineering, (1999-2004)

Dissertation: Energy Consumption Audit and Management

Bachelor Research Project: The reduction of energy consumption has gradually become more critical worldwide since the rise of fuel costs in the 1970s. In this project, all effective parameters for energy consumption in all types of buildings were identified. Then, for each parameter, a specific criteria sheet was designed. Finally, all criteria sheets were finalized by a comprehensive survey completed by mechanical, electrical, and civil engineers. The finalized sheets were used to audit energy consumption for more than ten residential and industrial complexes. The results showed that managing the energy consumption in the studied buildings can reduce energy use by up to %15.



Completed (Examples 2012-2024)

1

Title: Enhancing Operational Excellence and Sustainability at Newmont through Advanced Analytics: A Practical Approach for a Value Driver Tree Application

Organization Name: Newmont – IBM

Duration: From 01-July-2023 to 01-Jan-2024

Business Challenges: In the dynamic global mining industry, Newmont grapples with challenges like optimizing operational efficiency amid market fluctuations and varying ore grades. Environmental sustainability and regulatory compliance pose ongoing challenges, along with the need for innovation and technology integration to stay competitive. Managing global complexities such as supply chains, workforce diversity, and geopolitical risks requires a nuanced approach. To address these issues, a value driver tree application is proposed, offering Newmont a comprehensive analytical tool for deeper insights into operational variables. This facilitates informed decision-making and strategic planning, aiming to enhance overall business performance.

Suggested Solution: To tackle Newmont's challenges, we propose an advanced Value Driver Tree (VDT) app. This solution dissects mining operations, providing a detailed view of factors influencing value creation. The VDT app employs analytics and machine learning to identify key drivers and bottlenecks, offering actionable insights for strategic decision-making. It facilitates scenario analysis to assess decision impacts under varying conditions. Integrating this tool empowers Newmont to make data-driven decisions aligning with strategic objectives, driving operational excellence and sustainable growth.



2

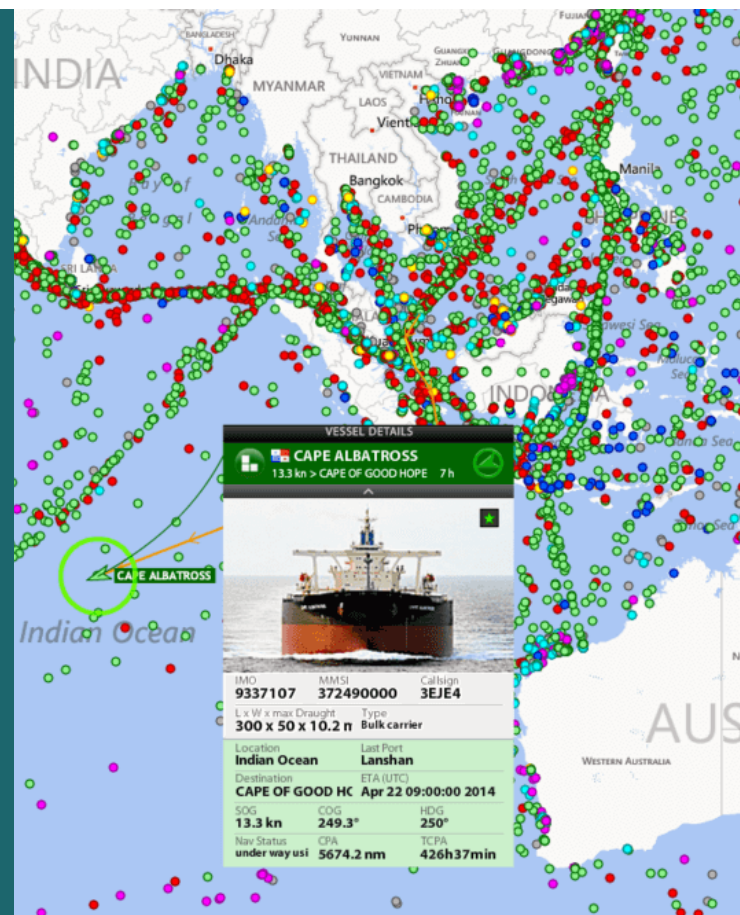
Title: Vessel Movement Tracking and Predict Vessel Destinations (Vessel Supply and Demand Forecasting)

Organization Name: Vale – IBM

Duration: From Jan 2020 To Dec 2022

Business Challenges: The number of vessels to transfer material is limited. There are few big competitors, and predicting available chartering vessels is essential for big companies. Machine learning is an innovative method to predict vessel availability in different regions. As a result, many companies optimize costs and returns. On another side, it is essential to predict the demand for vessels. Few big companies need the capsized vessels to transfer the material between countries. Therefore, predicting the vessel supply and demand has been a critical challenge for companies.

Suggested Solution: Gathering data from different internal and external resources automatically and feeding the cleansed and sorted data to a Random Forest prediction model can help mine companies to estimate the vessels' availability and predict their final destination. This application is a powerful tool to reduce the cost of shipping dramatically and to make sure that the produced materials will be delivered at the right time to the customers' ports.



3

Title: Condition Based Maintenance in Mine Railway Transportation Systems Based on Big Data Analysis**Organization Name: Vale – The University of Genova****Duration: From Feb 2019 To Jul 2022**

Business Challenges: Streaming Data Analysis (SDA) of Big Data Streams (BDS) for Condition Based Maintenance (CBM) in the context of Rail Transportation Systems (RTS) in the mining industry is a state-of-the-art field of research. SDA of BDS is the problem of analysing, modelling, and extracting information from vast amounts of data that continuously come from several sources. Among others, CBM for Mining Rail Transportation is one of the most challenging SDA complications, consisting of implementing a predictive maintenance system for evaluating the future status of the monitored assets to reduce risks related to failures and avoid service disruptions. The challenge is to collect and analyse all the data streams that come from the numerous onboard sensors monitoring the assets.

Suggested Solution: This project deals with the problem of CBM applied to the condition monitoring and predictive maintenance of train axle bearings based on sensors data collection to maximize their Remaining Useful Life (RUL). This project proposes an innovative algorithm for CBM based on SDA that takes advantage of the Online Support Vector Regression (OL-SVR) for predicting the RUL. The novelty of this proposal is the heuristic approach for optimizing the trade-off between the accuracy of the OL-SVR models and the computational time and resources needed to build them. Results from tests on real collected datasets show the real benefits brought by the proposed methodology.



4

Title: Development of a Maturity Scale for Mining Performance and Maintenance Analytics

Organization Name: Vale – The University of Queensland

Duration: From Jan 2019 To Dec 2021

Business Challenges: Since the onset of the slump in commodity prices in mid-2012, the mining industry has sought to significantly enhance productivity and lower labor and cost inputs. Most companies have progressed through two to three waves of cost-cutting exercises, with the result that much of the low-hanging fruit has been plucked, and further cost reduction demands the application of more innovative, more targeted thinking. As a result, there is currently a great deal of interest in implementing data analytics to improve equipment performance and reduce maintenance downtime and costs.

Suggested Solution: The potential exists for mining companies to contract expensive analytics programs only to be disillusioned by failing to create the magnitude of savings and performance gains promised. In response to these issues, Vale, in conjunction with the University of Queensland has identified the need to develop a maturity model designed to be specific to the mining industry to assess mining companies' capabilities to use analytics to deliver performance improvements in the areas of equipment operations and maintenance. These areas have been selected as they are the current focus for many mining companies- to optimize costs and returns. This project developed a framework, approach, methodology, and tools for assessing the maturity of analytics solutions for the Australian and Brazilian mining industries employed to enhance equipment performance and maintenance. A questionnaire will be developed and completed via telephone interviews with key personnel. Analysis of the collected information is expected to reveal a national picture of analytics take-up in the mining industry and the relative status of individual participant companies.



5

Title: Predict Vessel Chartering Cost

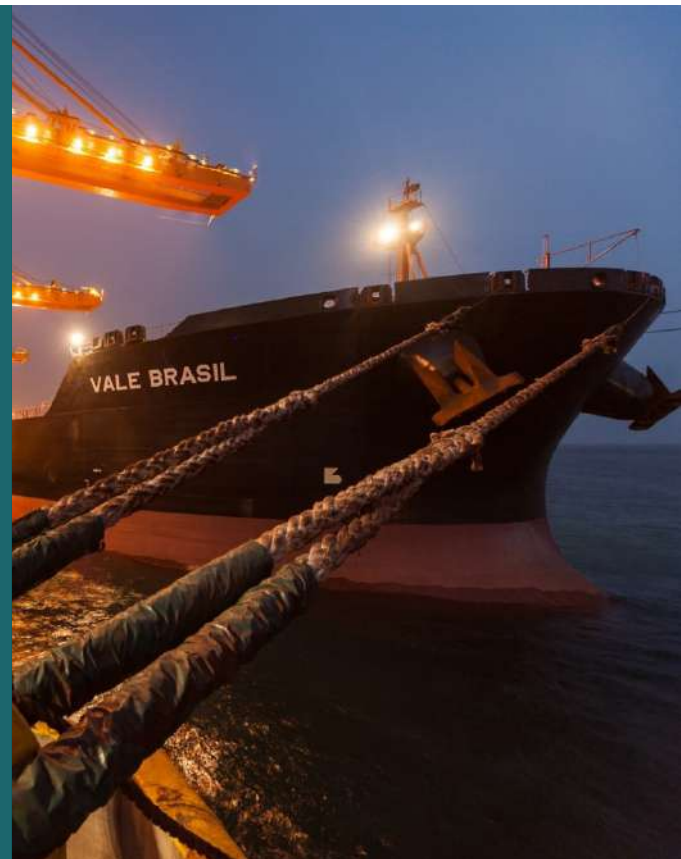
Organization Name: Vale – IBM – Deloitte

Duration: From Jan 2018 to Dec 2019

Business Challenges: The rate of material shipping (TC rate) is a dynamic parameter. This parameter plays a critical role in estimating the final material cost. There is an opportunity to build an integrated architecture and analytical platform that can provide business users with optimal decision capabilities based on a holistic overview of short-term supply, expected demand, and TC rate movement over the next 30 – 60 days. The TC rate prediction has been a critical challenge for the big mining companies that need to charter huge vessels to transfer their produced materials. Lack of accurate data and facing dynamic variables have made this challenge more complicated.

Suggested Solution:

- Integrated Cargo Demand Prediction and Global Vessel Movement data housed on the same analytical data warehouse, Azure Synapse
- Integrated Supply and Demand analysis visualization on PowerBI
- Future-ready and reusable architecture to house related supply and demand projects such as TC Rate forecasting
- Providing intelligent suggestions based on AI for the users to reduce the cost of chartering



6

Title: Advanced Predictive Analytics

Organization Name: Vale – The University of Queensland

Duration: From Jun 2015 To May 2017

Business Challenges: In the current economic climate, minimizing costs is critical. Equipment reliability must be stepped up to increase production and reduce delays. Equipment reliability requires effective maintenance. Maintenance expenses in the mining and oil and gas industries are commonly between 30% -50% of total operating costs. Shutting down the process and potential injuries are two critical challenges in sites that advanced predictive analytics can potentially solve them. The competitive market has forced companies to find a practical solution to decrease the total product cost; moreover, improving safety has always been one of the important concerns for companies, and advanced analytics can be a good solution for that.

Suggested Solution: The overall goal is the application of Advanced Analytics to reduce unscheduled maintenance delays, prevent equipment machine damage, avoid catastrophic failures, and provide a platform for ongoing predictive maintenance. In deep dive, outcomes and benefits can be categorized into two mine haul truck disastrous brake failure examples; distinguish between "Real" versus "Spurious" alarms, and evaluate which proactive diagnostics are the best predictors of haul truck equipment damage unscheduled maintenance.



7

Title: Discrete-Event Simulation of Payload Variance Effects on Truck Bunching

Organization Name: BHP – The University of Queensland

Duration: From Jul 2013 To Jun 2015

Business Challenges: Data collected from payload management systems at some surface mining operations show significant variance. Heavily loaded trucks travel slower up ramps than lightly loaded trucks. Faster trucks are slowed by the presence of slower trucks, resulting in "Bunching" and production losses. Increasing the maintenance and operation cost is one of the important problems caused by payload variance. Payload variance can also put unexpected pressure on downstream processes such as crushing. Moreover, bunched trucks make critical changes for dispatching and controlling traffic systems in surface mines.

Suggested Solution: This project has been completed to develop an algorithm and software for estimating the effect of truck bunching on productivity, fuel consumption, gas emissions, cycle time, and associated cost. In this project, a Discrete-Event Simulation Algorithm was developed to predict truck bunching in large open-pit mines; a user-friendly software was developed based on the completed algorithm; presented real site datasets validated model and software; bunching software can be used to complete the results of other software such as Talpac, and the completed algorithm can be useful to find the effect of bunching on haul truck fuel consumption, gas emissions, cycle time and associated cost.



8

Title: The Effects of Payload Variance on Haul Truck Energy Consumption, Greenhouse Gas Emissions, and Cost

Organization Name: Rio Tinto – The University of Queensland

Duration: From Nov 2013 To Feb 2014

Business Challenges: The data collected from truck payload management systems at various surface mines show that the payload variance is significant and must be considered in analyzing the mine productivity, diesel energy consumption greenhouse gas emissions, and associated costs.

Suggested Solution: This project investigated the effects of truck payload variance on diesel energy consumption, greenhouse gas emission, and their associated cost in surface mining operations. The significance of this investigation is to determine the energy and cost-saving opportunities in haul truck operations. According to the Global Warming Potential guidelines, the greenhouse gas emissions corresponding to diesel consumption by haul trucks is calculated. The associated cost of greenhouse gas emissions and the cost of diesel consumption are determined based on the presented models by US Energy Information Administration. The results showed that the haul truck fuel consumption, greenhouse gas emissions, and costs non-linearly increase as the payload variance rises for all haul road friction and slope conditions. In this project, the correlation between the payload variance and cost-saving was developed. This correlation was independent of haul road condition and presented the amount of saving for different values of payload variance reduction. The cost-saving was calculated for an Australian surface mine as a case study. The analysis showed that up to 10% of the cost associated with fuel and CO₂-e emissions is saveable by reducing the standard payload deviation from 30 to 0.



9

Title: Development of a Multilayer Perceptron Artificial Neural Network Model to Determine Haul Trucks Energy Consumption**Organization Name: Anglo American – The University of Queensland****Duration: From Dec 2012 To Nov 2013**

Business Challenges: Diesel fuel is a significant source of energy in surface mining operations. Haul trucks are the primary users of this energy resource. Based on the analysis of the data collected from mine sites, Gross Vehicle Weight (GVW), Truck Speed (S), and Total Resistance (TR) were identified to be the most influential parameters affecting fuel consumption. However, the relationship between the three parameters mentioned above and the truck fuel consumption is complicated. Thus, developing a new approach using artificial intelligence was essential to create a reliable model for solving this problem. AI can be a good solution for this type of complex project because the number of effective parameters can be increased in the modelling phase and the application can retrain itself with the actual fresh data during the operation.

Suggested Solution: In this project, an Artificial Neural Network (ANN) model was developed to predict the fuel consumption of haul trucks in surface mines. It was found that the configuration of 3 input variables, 15 hidden cells, and one output for the synthesized ANN model provided excellent results. Furthermore, the sensitivity analysis showed that all the three input variables (GVW, S, and TR) have a noticeable effect on truck fuel consumption.



In Progress (Examples 2021 – 2024)

1**Title:** Mine to Mill Integrated Intelligent Optimization**Organization Name:** Vale-Julius kruttsehnitt Mineral (The University of Queensland)**Start and Estimated Duration:** Jan 2023,24 months

Business Challenges: Mining operations involve a series of inter connected processes affects the whole function significantly. The downward trends in average are grades and increasing mining coasts underline the needs to find the best possible situation for every job or to optimize. Mining individual operational optimizations are very beneficent for mining industry. However, the studies show that integrated optimization methods can potentially bring more positive achievements and help companies to not only increase their operational synergies but also save projects time and coast.

Suggested Solution: Vale introduced a new integrated and comprehensive AI based optimization approach to connect the pervious separated operations from drilling to milling named Mines, Move, Mill(3M). This ingratiated approach helps to increase the quantity and quality of gathered data through the define operations and this new capability can potentially increase to accuracy of advanced analytics results. Finally, the developed their products cost, improve energy efficacy, protect environment and increase safety.



2

Title: An Enhanced Wavelet-ARIMA Method for Predicting Metal Prices**Organization Name: Vale – Cranfield University****Start and Estimated Duration: Jul 2022, 24 Months**

Business Challenges: Metal price predictions support evaluations of future profits from metal exploration and mining and inform purchasing, selling, and other day-to-day activities in the metals industry. Past research has shown that repeated behaviour is a dominant characteristic of metal prices. Wavelet analysis allows capturing this cyclicity by decomposing a time series into its frequency and time domain.

Suggested Solution: This project assesses the usefulness of an improved combined wavelet-autoregressive integrated moving average (ARIMA) approach for predicting monthly prices of iron, aluminium, copper, lead, and zinc. The performance of ARIMA models in forecasting metal prices is demonstrated to be increased significantly through a wavelet-based multiresolution analysis (MRA) before ARIMA model fitting. The method demonstrated in this project is an innovative approach because it identifies the optimal combination of the wavelet transforms type, wavelet function, and the number of decomposition levels used in the MRA and, in that way, increases the prediction accuracy significantly.



3

Title: Advanced Analytics and AI application to predict the quality of the concentration

Organization Name: Vale- IBM

Start and Estimated Duration: July 2022, 24 months

Business Challenges: The vale in process Quality Assurance (IPQA) team provides quality with accumulated production data for concentration products. Dependency on the historical data, they will place a service order to the concentration plant with detail of expected quality and mass recovery rate in final services order. Production service orders are typically placed around one month before material arrival.

The service order detail is reference for the planning and commercial teams. In addition, vale IPQA team provides guidance and manage product quality third-party concentration plants.

It is difficult for the IPQA team to simulate and predict the quality of materials because no historical data is available and testing the materials in laboratory is expensive and time-consuming process.

Today vale has been registered testing the materials in laboratory is expensive and concentration plants operated by third-parties in china. Concentration service orders has increased 3 times compared with 2021, and a further increase is predicted.

To support operation and sustain the advantage of the quality prediction, the IPQA team wants to leverage the advanced analytics capability of Vale AI center to develop a customized AI product with integrated forecasting models.

Suggested Solution: Vale thinks about developing an AI based model to analyze more than 20 effective parameters on concentration quality and make a comprehensive logical and mathematical relationships between these parameters and concentration quality aimed to predict quality instead of testing real material in laboratories.

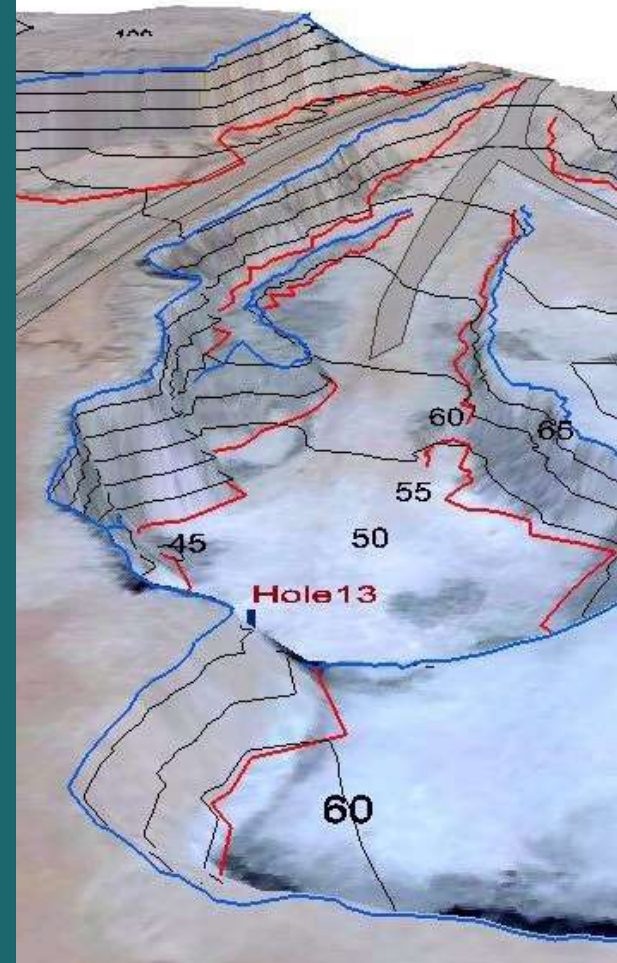


4

Title: Predictive Modelling of Nickel Potential with the Integration of Multisource Information Based on Random Forest**Organization Name: Vale – University of Granada****Start and Estimated Duration: Jun 2022, 36 Months**

Business Challenges: Mineral exploration activities require robust predictive models that accurately map the possibility that mineral deposits can be found at a specific location. The traditional approaches are not accurate enough, and new technologies such as AI-developed applications can be useful to predict the one source of mine material and estimate the reservoir.

Suggested Solution: Random forest (RF) is a powerful machine data-driven predictive technique unknown in potential mineral mapping. This project explores the performance of RF regression for the nickel deposits in the vale mine sites in Sudbury, Ontario, Canada. The results of this project indicate that the use of RF for the integration of sizeable multisource data sets used in mineral exploration and for the prediction of mineral deposit occurrences offers several advantages over existing methods. RF's key benefits include the simplicity of parameter setting, an internal unbiased estimate of the prediction error, the ability to handle complex data of different statistical distributions, responding to nonlinear relationships between variables; the capability to use categorical predictors; and the capacity to determine variable importance. Variables that RF identified as most significant coincide with well-known geologic expectations. To validate and assess the effectiveness of the RF method, nickel prospectively maps are also prepared using the Logistic Regression (LR) method.



5

Title: Predict Iron Ore Demand in Chinese Steel Market; Using Artificial Intelligence**Organization Name: Vale – DTI – EY****Start and Estimated Duration: Jan 2022, 36 Months**

Business Challenges: The Vale marketing intelligence team provides insights on various business areas for critical decision-making. These insights are derived by combining several individual excel-based models from different team members (each responsible for a particular sub-topic).

As the complexity of analysis/ forecast is increasing, the team is finding it difficult to maintain and consolidate the different excel based models. This leads to a longer time for consolidating analysis and poses a risk to the quality of output (in terms of duplicates and inconsistency in sources; lack of integration between the sub-teams; Slowness in generating and consolidating results from models that are not coupled and back-feed by other components, leading to loss of productivity and time dedicated for more advanced analysis).

Suggested Solution: To gain deeper insights, the marketing team wants to leverage the advanced analytics capability of Vale AI Centre to develop a custom AI product with integrated forecasting models. This model can track the vessels' movement and predict their final destinations. The AI model will support an automated pipeline to feed the required data to the model, and the users will have access to a comprehensive dashboard. All processes will happen online as a cloud base application.



6

Title: Different Techniques for Predicting Mineral Product Prices**Organization Name: Vale – University of New South Wales****Start and Estimated Duration: : Jun 2021, 24 Months**

Summary: Predicting Mineral Product (MP) prices have been a significant and the problematic task is usually addressed by econometric, stochastic-Gaussian, and time series methods. None of these methods has proved suitable to characterize the dynamic behavior and time-related nature of MP markets. Chaos Theory (CT) and Machine Learning (ML) methods can signify the temporal relations of variables, and their evolution has been used separately to understand better and represent MP markets.

Suggested Solution: Chaos Theory (CT) can determine a system's dynamics through time delay and embedding dimension. However, this information has often been exclusively used to define the system's behavior and not for predicting. Compared to usual methods, ML has better performance for predicting MP prices due to its capacity for finding patterns governing the system's dynamics. However, the rational nature of economic complications increases concerns regarding using hidden patterns for predicting. Therefore, it is indeterminate if variables are selected, and hidden patterns found by ML can represent economic rationality. In the face of their advanced features representing system dynamics, the different use of either CT or ML does not deliver the expected realistic accuracy. By itself, neither CT nor ML can identify the primary variables affecting systems, recognize the relation and influence of variables through time, and discover hidden patterns governing systems evolution simultaneously. This project discusses the need to adapt and combine CT and ML to obtain a more realistic representation of MP market behavior and predict long-term price trends.





AWARDS



- **Australia to USA Fellowship**, American Australian Association, USA, July 2016

- **Graduate School International Award**, The University of Queensland, Australia, June 2015

- **School of Engineering Award**, The University of Queensland, Australia, July 2014

- **CRCMining Award**, Mining3 Transforming Mining, Australia, July 2014

- **CRCMining Research Higher Degree Scholarship**, Mining3 Transforming Mining, Australia, January 2012

- **International Scholarship**, The University of Queensland, Australia, December 2011

- **National Top Inventor**, National Elites Foundation, July 2011

- **Certificate of top lecturer**, Queensland University of Technology, Australia, July 2010

- **First-rank graduate**, Department of Industrial Engineering, January 2009

- **Certificate of the top researcher in the field of energy management**, Power Ministry , June 2005

- **First-rank graduate**, Department of Engineering, February 2004

- **Ranked first in National Computer Olympiad**, Ministry of Education, February 1997

- **Ranked second in National Physics Olympiad**, Ministry of Education, November 1996





PATENTS



1

Industrial and Medical Thermal Luminescent Dosimeter Finger Rings, USA Patent, 390070309, October 2011



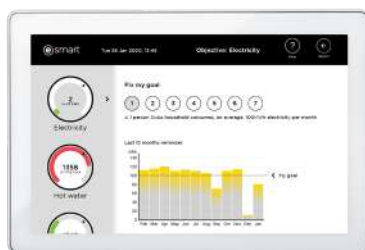
2

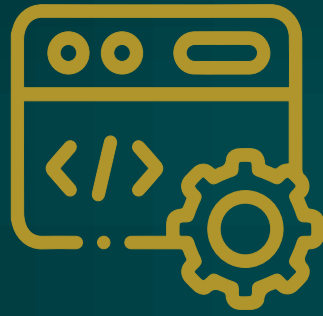
Industrial and Medical Filter Holders, USA Patent, 390050214, July 2011



3

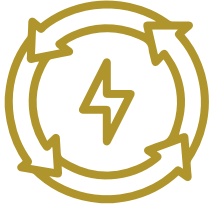
Building Energy Consumption Indicator, USA Patent, 390060408, February 2012





DEVELOPED SOFTWARE PACKAGES





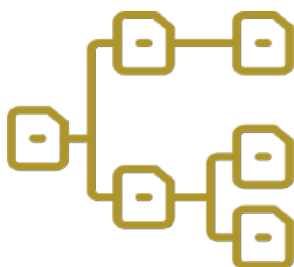
Energy Saving Audit Management (ESAM)
USA, 2011

CRC Truck Bunching, Australia, 2016

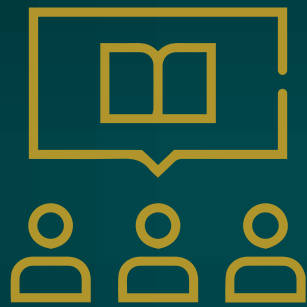


FCM Haul Truck, Australia, 2017

Mineral Freight Rate Prediction (Sentinela)
Australia – Singapore, 2019



Value Driver Tree for Mining
USA – Australia, 2023



EDUCATIONAL EXPERIENCES (Teaching)



- **Introduction to Mining (MINE2105)**, The University of Queensland, Australia

- **Fundamentals of Fluid Mechanics (MECH2410)**, The University of Queensland, Australia

- **Engineering Design (ENGG1100)**, The University of Queensland, Australia

- **Fluid Mechanics (MINE2101)**, The University of Queensland, Australia

- **Mine Ventilation (MINE3124)**, The University of Queensland, Australia

- **Structural Mechanics for Mining (MINE2123)**, The University of Queensland, Australia

- **Project Management Professional**, The University of Queensland, Australia

- **Thermodynamic (I) & (II)**, The University of Queensland, Australia

- **Heat Transfer (I) & (II)**, The University of Queensland, Australia

- **Static**, The University of Queensland, Australia

- **Mechanics of Materials**, The University of Queensland, Australia

- **Manufacturing Processes**, The University of Queensland, Australia

- **Mechanics of Fluids**, The University of Queensland, Australia





MANAGEMENT SKILLS





Project Integration Management



Project Time and Cost Management



Project Human Resource Management



Project Risk Management



Project Scope Management



Project Quality Management



Project Communication Management



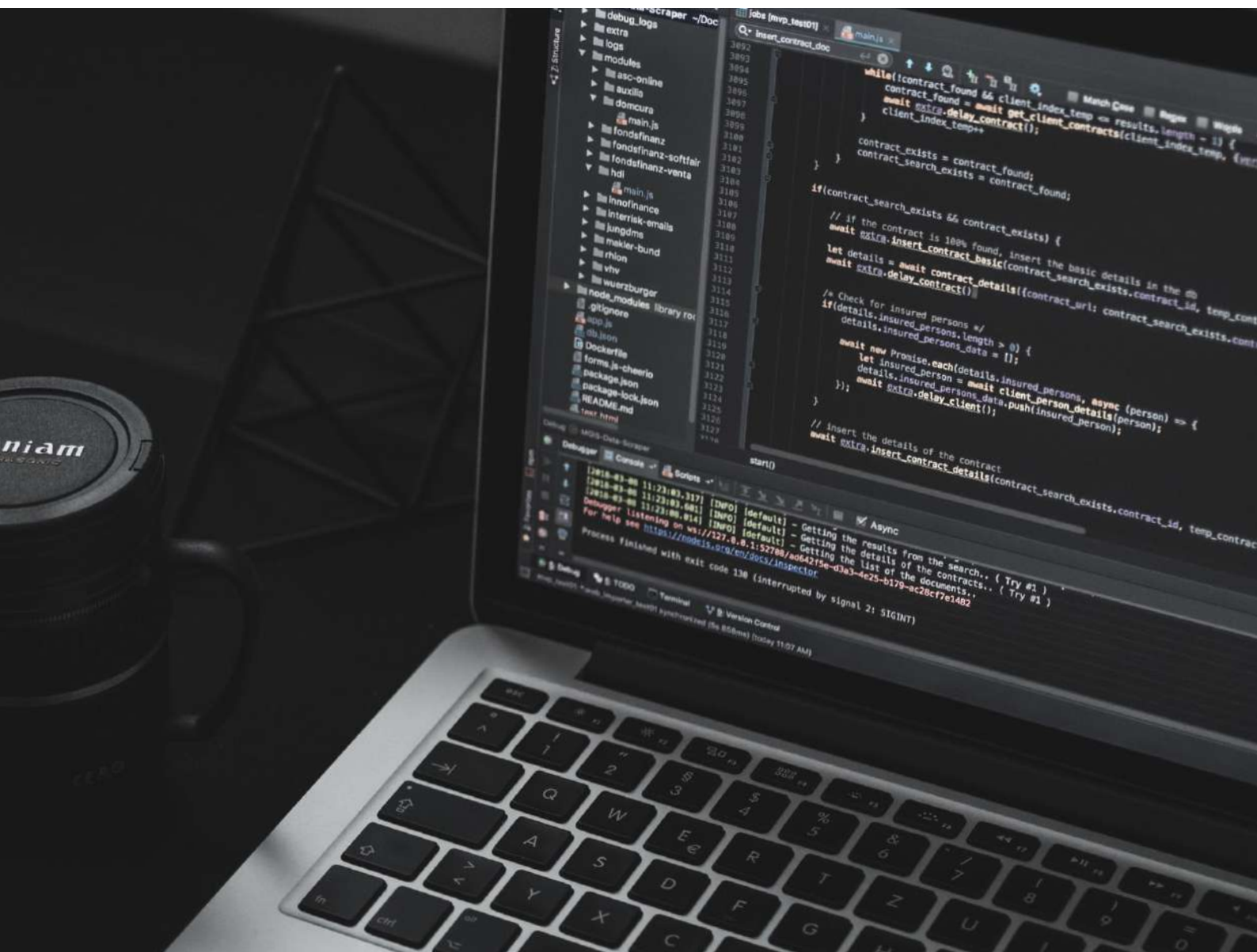
Project Procurement Management

The Project Management Professional (PMP)® is the world's leading project management certification. Now including predictive, agile and hybrid approaches, the PMP® proves project leadership experience and expertise in any way of working. It supercharges careers for project leaders across industries and helps organizations find the people they need to work smarter and perform better.





COMPUTER SKILLS



□ **Mechanical Engineering:** Fluent 12, PDMS 12.1. Sp 4.0, Carrier.

□ **Data Mining:** R Studio 3.4.0, TIBCO Spotfire 7.0, Tableau 10.2, SPSS 23.0, Visual Basic, C++, Arena, Tech plot 360, Curve Expert 2.1, Sigma Plot 12.5, Matlab 9.1 R2017b, FlexSim 7.7, Python

□ **Mining Engineering:** Talpac 11, Vensim 6.4E





PUBLICATIONS



Published Books

1

Book Title: Numerical Simulation - Advanced Techniques for Science and Engineering

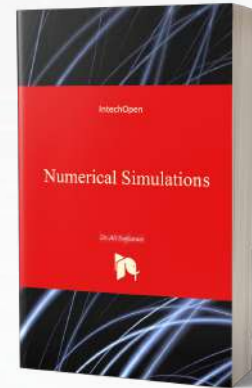
Editor: Ali Soofastaei

Publisher: IntechOpen

Publication Year: 2023

Number of Pages: 340

ISBN: 9781803569543

**2**

Book Title: Advanced Virtual Assistants - A Window to the Virtual Future

Editor: Ali Soofastaei

Publisher: IntechOpen

Publication Year: 2023

Number of Pages: 200

**3**

Book Title: The Application of Ant Colony Optimization

Editor: Ali Soofastaei

Publisher: IntechOpen

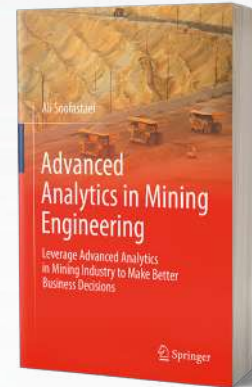
Publication Year: 2022

Number of Pages: 90

ISBN: 9781839681769



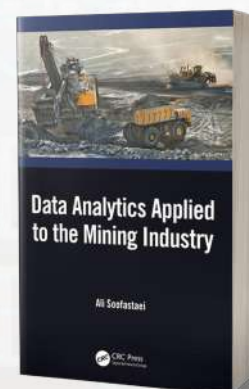
4

Book Title: Advanced Analytics in Mining Engineering**Editor:** Ali Soofastaei**Publisher:** Springer**Publication Year:** 2022**Number of Pages:** 747**ISBN:** 9783030915889

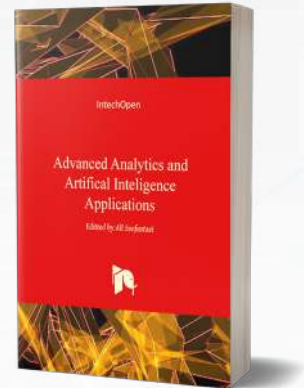
5

Book Title: Virtual Assistant**Editor:** Ali Soofastaei**Publisher:** IntechOpen**Publication Year:** 2021**Number of Pages:** 122**ISBN:** 9781839688072

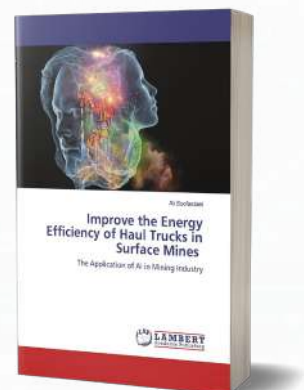
6

Book Title: Data Analytics Applied to the Mining Industry**Editor:** Ali Soofastaei**Publisher:** CRC Press**Publication Year:** 2020**Number of Pages:** 272**ISBN:** 9781138360006

7

Book Title: Advanced Analytics and Artificial Intelligence Applications**Editor:** Ali Soofastaei**Publisher:** IntechOpen**Publication Year:** 2019**Number of Pages:** 112**ISBN:** 9781789846393

8

Book Title: Improve the Energy Efficiency of Haul Trucks in Surface Mines**Editor:** Ali Soofastaei**Publisher:** Lambert Academic Publishing**Publication Year:** 2019**Number of Pages:** 164**ISBN:** 9786200476258

In Progress Books

1**Book Title:** Advanced Analytics for Sales and Marketing**Editor:** Ali Soofastaei**Publisher:** CRCPress**Publication Year:** 2025**Number of Pages:** 110**2****Book Title:** Advanced Artificial Intelligence**Editor:** Ali Soofastaei**Publisher:** CRC Press**Publication Year:** 2024**Number of Pages:** 215**3****Book Title:** Artificial Intelligence**Editor:** Ali Soofastaei**Publisher:** CRCPress**Publication Year:** 2024**Number of Pages:** 180

4

Book Title: Hauling Operation Improvement**Editor:** Ali Soofastaei**Publisher:** CRCPress**Publication Year:** 2024**Number of Pages:** 95

5

Book Title: Advanced Analytics for Asset Management**Editor:** Ali Soofastaei**Publisher:** CRC Press**Publication Year:** 2024**Number of Pages:** 110

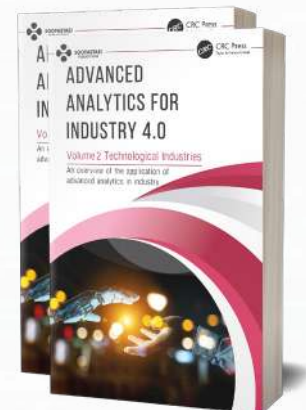
6

Book Title: Advanced Analytics for Finance**Editor:** Ali Soofastaei**Publisher:** CRCPress**Publication Year:** 2024**Number of Pages:** 120

7

Book Title: Advanced Analytics for Industry 4.0**Editor:** Ali Soofastaei**Publisher:** CRCPress**Publication Year:** 2024**Number of Pages:** 120

8

Book Title: Advanced Analytics for Industry 4.0**Editor:** Ali Soofastaei**Publisher:** CRC Press**Publication Year:** 2024**Number of Pages:** About 1500

9

Book Title: Life 4.0: Human Life in the Age of Artificial Intelligence**Editor:** Ali Soofastaei**Publisher:** Soofastaei-Publications**Publication Year:** 2024**Number of Pages:** About 350

10

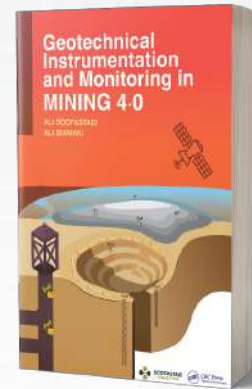
Book Title: Geotechnical Instrumentation and Monitoring in Mining 4.0

Editor: Ali Soofastaei

Publisher: CRC Press

Publication Year: 2024

Number of Pages: About 450





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Soofastaei, Ali. "Mines & Machines: Virtual Assistants in Modern Mining" Advanced Virtual Assistants - A Window to the Virtual Future, IntechOpen, 2023

Soofastaei, Ali. "Introductory Chapter: Numerical Simulation" Numerical Simulation-Advanced Techniques for Science and Engineering, IntechOpen, 2023

Soofastaei, Ali, et al. "Improve Energy Efficiency in Surface Mines Using Artificial Intelligence," Energy Efficiency, IntechOpen, 2022.

Soofastaei, Ali, et al. "Energy Efficiency Improvement in Surface Mining," Energy Recovery, IntechOpen, 2022.

Soofastaei, Ali. "Introductory Chapter: Ant Colony Optimization," The Application of Ant Colony Optimization. London, UK: IntechOpen, 2022.

Soofastaei, Ali, et al. "Advanced Analytics for Haul Trucks Energy-Efficiency Improvement in Surface Mines," Advanced Analytics in Mining Engineering. Springer, Cham. 2022. 539–556

Soofastaei, Ali, et al. "Advanced Analytics for Decreasing Greenhouse Gas Emissions in Surface Mines," Advanced Analytics in Mining Engineering. Springer, Cham. 2022. 523–537

Soofastaei, Ali, et al. "Advanced Analytics for Heat Stress Management in Underground Mines," Advanced Analytics in Mining Engineering. Springer, Cham. 2022. 691–709

Soofastaei, Ali, et al. "Advanced Analytics for Mine Exploration," Advanced Analytics in Mining Engineering. Springer, Cham. 2022. 147–167

Soofastaei, Ali. "Advanced Analytics for Rock Blasting and Explosives Engineering in Mining," Advanced Analytics in Mining Engineering. Springer, Cham. 2022. 363–477

Soofastaei, Ali, et al. "Advanced Analytics for Mine Materials Transportation," Advanced Analytics in Mining Engineering. Springer, Cham. 2022. 613–647

Soofastaei, Ali. "Advanced Analytics for Mining Industry," Advanced Analytics in Mining Engineering. Springer, Cham. 2022. 1–22

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Journal Papers

Soofastaei, Ali, et al. "Experimental Investigation of Effects of Coal Dust Contamination on Wet Bulb Temperature Measurements," Indoor and Built Environment Journal, Under Press (2024).

Soofastaei, Ali, et al. "Using the Wilcoxon-Signed-Rank Test for a Statistical Comparison of Two Surveys to Assess Safety and Risk Management in the Australian Coal Mining Industry," Computational Statistics and Data Analysis, Under Press (2024).

Soofastaei, Ali, et al. "Reducing Fuel Consumption of Haul Trucks in Surface Mines Using Genetic Algorithm," Applied Soft Computing Journal, Under Press (2024).

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Soofastaei, Ali. "Developing a Maturity Scale for Mining Performance and Maintenance Analytics," Journal of Engineering and Technology Management, Under Press (2024).

Alamdari, Saber, et al. "Application of Machine Learning Techniques to Predict Haul Truck Fuel Consumption in Open-Pit Mines," Journal of Mining and Environment, Volume 13, No 1, (2022), P:69-85.

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Soofastaei, Ali, et al. "Haul Trucks Queuing Prediction in Open Pit Mines," Australian Resources and Investment, Volume 14, No 1, (2020), P:28-31.

Soofastaei, Ali, et al. "Living in a Digital World," Australian Resources and Investment, Volume 14, No 1, (2020), P:34-37.

Soofastaei, Ali. "The Application of Blockchains to Mining," Australian Resources and Investment, Volume 13, No 1, (2019), P:28-30.

Soofastaei, Ali. "Energy-Efficiency Improvement in Mine-Railway Operation Using AI," Journal of Energy and Power Engineering, Volume 13, (2019), P:333-348.

Soofastaei, Ali, et al. "Development of a Maturity Scale for Mining Performance and Maintenance Data Analytics," Australian Resources and Investment, Volume 12, Issue 1, (2018), P:10-13.

Soofastaei, Ali, et al. "Integrated optimisation solution: an innovative approach to mining operational success," Australian Resources and Investment, Volume 12, No 2, (2018), P:9-13.

Soofastaei, Ali. "Haul Truck Tire Life Improvement using Water Cooling System," Australian Resources and Investment, Volume 12, Issue 1, (2018), P:18-20.

Soofastaei, Ali. "Improving Haul Truck Availability by Braking System Failure Prediction Using Advanced Data Analytics," Australian Resources and Investment, Volume 11, Issue 3, (2017), P:30-32.

Soofastaei, Ali. "The Art of Making Intelligent Decision: The Next Revolution in The Mining Industry," Australian Resources and Investment, Volume 11, Issue 3, (2017), P:20-22.

Soofastaei, Ali. "Intelligence Predictive Analysis to Reduce Production Cost," Australian Resources and Investment, Volume 11, Issue 1, (2017), P:24-26.

Soofastaei, Ali, et al. "Rolling Resistance in Haul Truck Operations," Australian Mining Journal, Volume 9, Issue 5, (2017), P:102-106.

Soofastaei, Ali, et al. "Advanced Data Analytics: A new competitive advantage to increase energy efficiency in surface mines," Australian Resources and Investment, Volume 10, Issue 1, (2017), P:42-45.

Soofastaei, Ali. "A discrete event model to simulate the effect of truck bunching due to payload variance on haul trucks' fuel consumption," Australian Resources and Investment, Volume 11, No 4.

Soofastaei, Ali, et al. "A discrete-event model to simulate the effect of truck bunching due to payload variance on cycle time, hauled mine materials and fuel consumption," International Journal of Mining Science and Technology, Volume 26, Issue 5, (2016), P:745-752.

Soofastaei, Ali, et al. "A Comprehensive Investigation of Loading Variance Influence on Fuel Consumption and Gas Emissions in Mine Haulage Operation," International Journal of Mining Science and Technology, 26 (2016), 995-1001.

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Soofastaei, Ali. "Improvement in Energy Consumption of Residential Buildings by Value Engineering," Oil and Energy International Journal, Issue 4, (2009), P:69-69.

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Soofastaei, Ali. "Energy Service Companies," Oil and Energy International Journal, Published, Issue 3, (2005), P:106-111.

Soofastaei, Ali. "Quality Challenges in Iran Oil Refinement Industries," Oil and Energy International Journal, Issue 5, (2005), P:42-53.

Soofastaei, Ali, et al. "National Software Package for Energy Conservation in Buildings," BEHSAZ Energy Journal, Issue 5, (2004), P:74-81.

Soofastaei, Ali. "Technology of using biogas from landfill in urban areas," Mechanical Engineering and Air Condition International Journal, Issue 20, (2004), P:62-72.

Soofastaei, Ali, et al. "Technology of extracting biogas from landfill in urban areas," Mechanical Engineering and Air Condition International Journal, Issue 19, (2004), P:98-112.

Soofastaei, Ali, et al. "Comparing Standards Between Internal and External Energy Consumption in Buildings," Nama Journal, Issue 113, (2004), P:32-39.

Soofastaei, Ali, et al. "Valuation of Energy Saving Potential in Ministerial Buildings," Mechanical Engineering and Air Condition International Journal, Issue 18, (2004), P:55-62.

Soofastaei, Ali. "Study on Energy Audit and Management Software," Nama Journal, Issue 114, (2004), P:101-110.



Conference Papers

A. Soofastaei, J. Davies, E. R. S. Faria, E. Antonio, D. S. Fonseca, "An Innovative Method to Decrease Fuel Consumption of Haul Trucks in Surface Mines,"

The 7th Brazilian Conference on Intelligent Systems (BRACIS), October 22 to 25, 2018, São Paulo, SP, Brazil.

A. Soofastaei, M. Fooladgar, M. Khaje Khabaz, "Continuous Quality Improvement and Cost Reduction Using Value Engineering," International Conference on

Management Science and Accounting, Oral Presentation, 5 March 2017, Tehran University, Iran.

A. Soofastaei, P. F. Knights, "Using Artificial Intelligence Models to Increase Energy Efficiency in Mining Industry," Fuel Cell Science and Technology 2016, Oral Presentation, 13-14 April 2016, Glasgow, UK.

A. Soofastaei, S.M. Aminossadati, M.S. Kizil and P.F. Knights, "Reducing Fuel Consumption of Haul Trucks in Surface Mines Using Artificial Intelligence Models," Coal Operators' Conference (Coal 2016), 09-12 February 2016, University of Wollongong, New South Wales, Australia.

A. Soofastaei, M. Khaje Khabaz, "Increasing Energy Efficiency in Residential Buildings Using Value Engineering," International Conference on Value Engineering and Cost Management, Oral Presentation, 4-5 January 2016, Tehran, Iran.

A. Soofastaei, S.M. Aminossadati, M.S. Kizil and P.F. Knights, "Simulation of Payload Variance Effects on Truck Bunching to Minimise Energy Consumption and Greenhouse Gas Emissions," Coal Operators' Conference (Coal 2015), 11-13 February 2015, University of Wollongong, New South Wales, Australia.

A Soofastaei, S.M. Aminossadati, M.S. Kizil and P.F. Knights, "Increasing Haul Trucks Energy Efficiency in Surface Mines Using Artificial Intelligence Methods," EAIT Postgraduate Conference, The University of Queensland, Brisbane, Australia, 2015.

A. Soofastaei, S.M. Aminossadati and M.S. Kizil "Development of an Artificial Intelligence Model to Determine Trucks Energy Consumption," Future Energy Conference, 3-5 November 2014, The University of New South Wales, Australia.

A. Soofastaei, "Innovative Models for Energy Management in Oil and Gas Industry," 10th International Energy Conference, Tehran, Iran, 2014.

A. Soofastaei, "Energy Efficiency Opportunities in Haul Truck Operations by Genetic-Algorithm-Based Multi-Function Optimisation," EAIT Postgraduate Conference, 11 June 2013, the University of Queensland, Brisbane, Australia.

A. Soofastaei, S.M. Aminossadati, M.S. Kizil, "The Integration of Energy Management (EM) with Manufacturing Execution Systems (MES) to reduce the energy consumption across mining and processing plants," The Australian Mining Technology Conference, 8-10 October 2012, University of Western Australia, Perth, Australia.

A. Soofastaei, "Energy Management Systems in Mining Industry," Energy Efficiency Opportunities Conference and Workshop, 23 August 2012, Novotel, Brisbane, Australia.

A. Soofastaei, "Australian Energy Bandwidth," Mechanical and Mining Conference, 11 June 2012, the University of Queensland, Brisbane, Queensland, Australia.

A. Soofastaei, "Steam Traps Maintenance as a Solution for Saving Energy," The 8th International Energy Conference, 24-25 May 2011, IRIB International Conference Centre, Tehran, Iran.

A. Soofastaei, "Saving Energy in Shell and Tube Heat Exchangers by Using Genetic Algorithm," The 2nd International Conference on Heat Exchanger Application in Oil and Energy Industries, 10-11 November 2010, TALASH Conference Centre, Tehran, Iran.

A. Soofastaei, "Optimised Biogas Production Technologies for Landfills in Urban Areas," the 1st Iranian BioEnergy Conference, 13 October 2010, IRIB International Conference Centre, Tehran, Iran.

A. Soofastaei, "Energy Recycling Potential from Urban Waste," the 7th National Conference on Energy, 22-23 December 2009, IRIB International Conference Centre, Tehran, Iran.

A. Soofastaei, "Ethanol as a Future Clean Fuel," The 16th Annual International Conference on Mechanical Engineering, 13-15 May 2008, Kerman University, Kerman, Iran.

A. Soofastaei, "Development of Fuel Cell's Technology Outlook in Iran," The 5th Conference on Fuel Conservation in Building, 7-8 Jun 2006, Iranian Fuel Conservation Company (IFCO), Tehran, Iran.

A. Soofastaei, "Design System for Providing Hybrid and Photovoltaic Power," Energy Research and Technology Centre, 22-23 April 2006, Isfahan, Iran.

A. Soofastaei, "Heating Intelligent Control Systems for Buildings," Energy Research and Technology Centre, 22-23 April 2006, Isfahan, Iran.

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A. Soofastaei, M. Sadri, A. Niroomanesh, "Energy Saving, Audit and Management (E.S.A.M) Design and Create Software," 3rd Conference on Fuel Conservation in Building, 17-18 February 2004, Hall Summit, Tehran, Iran.



Keynote Speaking & Conference Chairing

Soofastaei Ali, **AI Application in Mining, Opportunities and Challenges**, MiningTech World Conference & Exhibition, 4 – 5 December 2023, Madrid, Spain

Soofastaei Ali, **What Are Some Of The Practical Challenges Of Using General AI In Mining Operations?, Resourcing Tomorrow**, Mines and Money 2023, 28 – 30 November 2023, Business Design Centre, London

Soofastaei Ali, **Applying the power of data analytics and AI across the mining value chain**, 4th Annual Digitalisation In Mining Australia, 21 – 22 November 2023, Pan Pacific Perth, Perth, WA

Soofastaei Ali, **Digital Transformation in Mining: An opened window in front of Mining 4.0**, 1ST International Conference on The Digital Transformation in Steel & Mining Industry 2023, 11 October 2023, Broadcasting conference center Chamran Highway, Tehran, Iran

Soofastaei Ali, **Integrating AI into Mining Operations**, 8th International Conference on Geology and Mine Planning, 12 – 14 July 2023, Sheraton Hotel, Santiago, Chile

Soofastaei Ali, **Building Fully Autonomous Mines from Pit to Port**, 3rd Digital Mines 2023, 19 – 21 April 2023, Virtual Event

Soofastaei Ali, **Future of Mining; How Digital Solutions can support Sustainable and Responsible Mining**, 2ND MINING 4.0 ROADMAP FOR THE FUTURE, 30-31 March 2023, Radisson Blu Toronto Downtow Toronto, Canada

Soofastaei Ali, **Digital transformation: Opportunities and Challenges**, Data Virtual Summit (LIVE Webinar) 2023, 29th March 2023 , LIVE Webinar

Soofastaei Ali, **“Digital transformation roadmapping: Lessons learned, challenges & opportunities,”** CDAO Brisbane 2023, 7 – 8 March 2023, Hilton Brisbane

Soofastaei Ali, "Maturity Assessment Framework: An innovative approach to tackle the digital transformation challenges in mining," Autonomous Off-Highway Machinery Technology Hybrid Summit, 23-24 February 2023, Berlin, Germany

Soofastaei Ali, "Analytical Maturity Assessment; An Innovative Intelligent Tools for Mining 4.0," Future of Mining Australia 2023, 20 – 21 February 2023, Sydney Masonic Centre

Soofastaei Ali, "Implementation of Advanced Analytics and AI in Mining; Opportunities and Challenges," Autonomous Off-Highway Machinery Technology Hybrid Summit (Pre-Event Teaser), 24 January 2023, Online

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Soofastaei Ali, "Artificial Intelligence and Data Analytics Applications in Mining Operations," American Exploration & Mining Association's 128th Annual Meeting, 04 – 09 December 2022, Nugget Casino Resort, Sparks, Nevada, USA

Soofastaei Ali, "Transforming Mining Through Technology and Innovation," Mines and Money, 29 November – 1 December 2022, Business Design Centre, London, United Kingdom

Soofastaei Ali, "Application of AI to decrease the mine mobile equipment maintenance cost," Digitalization in Mining – Australia, 17 -18 November 2022, Hilton Adelaide – Adelaide, Australia

Soofastaei Ali, "Digital Transformation in Mining: Opportunities and Challenges," Mining 4.0, 08 – 09 November 2022, Barcelona, Spain

Soofastaei Ali, "Advanced Analytics in Mining: Opportunities and Challenges," International Mining and Resources Conference (IMARC), 2-4 November 2022, ICC Sydney

Soofastaei Ali, "Intelligent mining in the era of AI, opportunities, and challenges," Conference on Digital Mining Science, 12 – 14 September 2022, Olympic Hotel, Tehran, Iran as an Online/in-person Event

Soofastaei Ali, "Applying AI/Machine Learning to decrease the mine mobile equipment maintenance cost," Digitalization in Mining – North America, 31st August to 1st September 2022, Hilton Toronto, Toronto, Canada

Soofastaei Ali, "Using Artificial Neural Network to Improve Haul Truck Energy Efficiency and Reduce Green House Gas Emissions in Surface Mines," 10th Global Summit on Artificial Intelligence And Neural Networks, 29 August 2022, Zurich, Switzerland

Soofastaei Ali, "Scaling AI Across the Value Chain by Increasing Data Maturity," Scaling AI Online APAC, 28 – 29 June 2022, Melbourne, Australia.

Soofastaei Ali, "AI Application in Mining 4.0," Mines and Money, 04 – 05 May 2022, London, United Kingdom.

Soofastaei Ali, "AI Application in Mining, Opportunities, and Challenges," MiningTech World Conference & Exhibition, Hilton Hotel, 27 – 28 April 2022, London, United Kingdom.

Soofastaei Ali, "Smart Coaching in Digital Mines," Data Science in Mining, Swedish Mining Innovation and AI Impact Lab, 30 March 2022, Stockholm, Sweden.

Soofastaei Ali, "AI Challenges and Expectations," Corinium's Global Series CDAO Brisbane, 08 – 09 March 2022, Hilton Hotel, Brisbane, Australia.

Soofastaei Ali, "Artificial Intelligence and Data Analytics Applications in Mining Operations," American Exploration & Mining Association's 127th Annual Meeting, 06–10 December 2021, Nugget Casino Resort, Sparks, Nevada, USA.

Soofastaei Ali, "Application of Artificial Intelligence in Mining Engineering," The First Conference on Mining and Technology, 18 May 2021, Tehran, Iran

Soofastaei Ali, "Artificial Intelligence for Mining," MiningTechWorld Conference & Expo, 27 – 28 April 2021, Hilton Hotel Kensington, London, United Kingdom.

Soofastaei Ali, "Digital Transformation in The Mining Industry," Innovation in Mining Engineering, 03 March 2021, Colorado, USA.

Soofastaei Ali, "The Strategic Use of Artificial Intelligence and Analytics in Digital Engineering," The 2nd International Digital Engineering and Design Summit, 27 – 28 January 2021, Sydney, Australia.

Soofastaei Ali, "Artificial Intelligence Application in Mining-Opportunities & Challenges," Webinar series of the University of Tehran and the Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), 16 January 2021, Tehran, Iran.

Soofastaei Ali, "Advanced Analytics in Mining Industry; Opportunities and Challenges," Artificial Intelligence in Mining Conference, 17 November 2020, Ormstown, Quebec, Canada.

Soofastaei Ali, "Future Smart Mines With Artificial Intelligence: Vale's New Artificial Intelligence Mining Center," 2nd Digital Mines, 12 – 14 October 2020, Pan Pacific, Perth, Australia.

Soofastaei Ali, "IoT in Future Mining," Industry of Things World Asia, Sands Expo & Convention Center, 20 – 21 July 2020, Singapore.

Soofastaei Ali, "Future Technologies for Mining Industry," Future of Mining Australia, 23 – 25 March 2020, Sydney, Australia.

Soofastaei Ali, "Future Mining with Robots and Intelligent Machines," COBOTS 2020: Intelligent and Collaborative Robotics Automation Forum, 12 – 13 March 2020, Marriot Hotel, Melbourne, Australia.

Soofastaei Ali, "The Use of AI to Reduce Maintenance Costs," Digital aintenance & Field Service Automation Forum, 11 – 13 March 2020, Marriot Hotel, Melbourne, Australia.

Soofastaei Ali, "AI for Sustainable Mining," Innovation in Digital Mining Center, 18 October 2019, Santiago, Chile.

Soofastaei Ali, "Future Mining With Robots And Intelligent Machines," Intelligent and Collaborative Robotics Automation Forum, Sands Expo & Convention Center, 11 – 12 July 2019, Singapore.

Soofastaei Ali, "Building Fully Autonomous Mines from Pit to Port," 1st Digital Mines 2019, 10 – 12 April 2019, Pan Pacific Resort, Perth, Australia.

Soofastaei Ali, "Advanced Data Analytics: A Practical Method to Increase Rail Energy Efficiency in Mining Industry," 19th RailTech Europe, 26 – 28 March 2019, Jaarbeurs Utrecht, Netherlands.

Soofastaei Ali, "Blockchain for Mining," Digital Transformation in Mining Conference, 20 – 21 February 2019, Perth, Australia.

A. Soofastaei, "How to cost-effectively develop and deploy AI capabilities at your mining operation for a step-change in performance," 4th Annual Mines and Technology Americas, October 15 to 17, 2018, Toronto, Canada.

A. Soofastaei, "The digital transformation of mining," 3rd Annual Mines and Technology London, November 26 to 29, 2018, London, UK.



RECOMMENDATIONS



Prof. Peter Kinghts**BMA Chair and Head of Division of Mining The University of Queensland Australia**

I have had the pleasure of working with Dr. Ali Soofastaei since he commenced the Ph.D. program at The University of Queensland in 2012.

Dr. Soofastaei holds a Ph.D. and Post Doctoral Research Fellow in Mechanical and Mining Engineering. He has about 18 years of industrial experience in applying advanced analytics in mining and oil & gas companies. His academic and industry background led him to successfully enroll and complete a Ph.D. program investigating energy efficiency opportunities and greenhouse gas emission reduction in the mining industry. I have recently worked with Dr. Soofastaei to develop software to quantify truck congestion (or bunching) on open pit haulage ramps.

Dr. Soofastaei's industrial background enables him to adopt a disciplined project approach. He is well organized and hardworking and demonstrated considerable initiative within his Ph.D. area. In addition, he possesses excellent communication and or project management skills.

His outstanding strengths are his depth and breadth of knowledge of applied advanced analytics, punctuality, preparedness, and confidence.

I have no doubt that Dr. Soofastaei is an industrial history-maker in his field.

Douglas Pimenta**Artificial Intelligence Program Leader**

I've been working together with Dr. Ali Soofastaei since 2017. As a result, we implemented several mine projects to increase sustainability, reduce cost, and bring performance gains to the mine and its equipment. Dr. Ali is not only a great researcher, but he can also put theory into practice and adapt his studies according to the specificity of each location.

Abhishek Kaul**AI | Sustainability | Digital | Consulting Services, IBM**

I had worked with Ali since 2019 when Vale engaged IBM for advanced analytics projects. He is very energetic and has to drive to lead projects to completion by guiding the team and removing roadblocks. In addition, he has deep expertise in where to apply advanced analytics technologies in the mining industry for digital transformation. Working with him to deliver many projects and drive business benefits for the shipping team has been a pleasure.

Prof. Paul Lever**CEO CRCMining Australia**

It is my great pleasure to write this recommendation for Dr. Ali Soofastaei. I have known Ali since he started his Ph.D. at the University of Queensland in July 2012.

Dr. Soofastaei has been involved in several projects funded through CRC Mining Australia. I'd like to introduce myself. I am currently the CEO of the cooperative Research center for Mining (CRC Mining) and a Mining Engineering professor in the Mining Division of the school of Mechanical and Mining Engineering at the University of Queensland (UQ). I have been at the UQ since July 2000 as a professional Research Fellow. Before joining the UQ, I spent 10 years as a faculty member in the Department of Mining and Geological Engineering Department at the University of Arizona.

Dr. Soofastaei's background in energy management and advanced analytics while working with several companies in the resources field fits the CRC Mining's Mining company members' interests in this area very well. Using AI and advanced analytics in mining operations is critical for the industry's future viability. Dr. Soofastaei's knowledge and related experiences can be beneficial to help the mining industry have a successful digital revolution.

In closing, Dr. Soofastaei is a high intelligence, creative and dedicated person who is a pleasure to interact with.

I am very optimistic about his abilities to undertake and successfully engage with global researchers, and his work will be highly significant to the field. Dr. Soofastaei is an intelligent expert in his field, and he always has my support without reservation.

Daniel C. Weiss

Senior Manager | Strategy | Business Development | Innovation Change | Management, Vale

I have been working with Ali for ~2 years now and am impressed by his technical skills, eagerness to learn, and transparent and very direct (yet kind) communication style. It has been a very fruitful partnership for us (clients), and I hope it will continue for quite some time.

Edson Antonio

Senior Manager for Data, Digital, Tech Strategy | Writer | Global Speaker | Advisor, Vale

I had the opportunity to work with Dr. Ali Soofastaei over the last 2 years, which was a learning period for me. Ali is fully engaged in delivering nothing but the best for every product he is working at. An excellent example of this commitment was the Energy Efficiency program we started for a corridor of mines in the Brazilian South and Southeast regions. Ali provided guidance from the initial definitions to the roadmap phase, and today this project has become a successful program worldwide. Ali is very kind, and it is easy to deal with him. He has the talent to build relationships.

Lirielly Vitorugo

Data Scientist | Artificial Intelligence | Engineer | Optimization, Capgemini Engineering

I have been working with Ali in Artificial Intelligence Center at Vale. During this time, I could perceive some of his skills, like how he tries to understand Vale's supply chain deeply with a vision towards improving the process. He is also intelligent, has excellent communication skills, can deal with problems in different situations and prospects, and is always available to help the team when requested. With all that said, I really like to work with Ali, I have been learning a lot with him, and I hope we continue working together.

Zhongwei Chen**Senior Lecturer in Applied Geomechanics, University of Queensland Australia**

Ali is driven and motivated in his work. Always maintain a positive attitude to research projects. Ali always comes early and is very conscientious of timelines and resources. The most outstanding characteristic I have seen is his attitude toward continuous improvement.

Mehmet Kizil**Associate Professor and Mining Program Leader, The University of Queensland**

I have been involved in the supervision of more than 25 RHD students, one of whom was Dr. Ali Soofastaei. Ali was one of the top students. He is very hard-working, very efficient, and an enthusiastic researcher. He has a great personality, creates a positive workplace atmosphere, and is academically outstanding. I used to call him a paper publishing machine, every supervisor's dream student. Wishing him good luck and all the best for his future career.

Jeremy Davies**CEO, ALI4Business**

Dr. Ali Soofastaei is a highly skilled scientist and engineer with experience in the Oil & Gas and Mining sectors and deep expertise in the simulation and analysis of complex systems and processes.

We worked together in the mining industry over the last 12 mths, during which time Ali analyzed truck, shovel, and mining operating and maintenance activities for coal mines. His work focused on identifying production throughput and cost reduction opportunities. Ali developed a novel, leading-edge analytical tools, validated them with data from operating mines, and presented them practically and systemically. His work is thorough, accurate, innovative, and supported by his engineering experience and pragmatic approach to solving real problems.

Ali is very well-organized and easy to work with, and I have no hesitation in highly recommending him to colleagues.

Ben Yang**Geotechnical Engineer, Anglo American**

Ali is driven and motivated in his work. Always maintain a positive attitude to the research problem. Ali always came early, stayed late working, and was very conscientious of timelines and resources. However, the most outstanding characteristic I have seen is his attitude toward continuous improvement.

Jéssica Prata**Head of Business & Growth Intelligence | Engineer | MSc. AI, Tegrus**

I worked with Ali on some Artificial Intelligence projects involving diesel engines and other engineering issues. Ali always acted with a lot of availability and assertiveness in his indications and was willing to listen and learn. Having Ali on the team is relevant and contributes significantly to deliveries and decision-making.

Eddie Prochon**Senior Electrical Engineer at Mining3**

Ali and I regularly engage in reporting meetings for the Mine Production and Performance Optimisation program at Mining3. What stands out the most is Ali's passion for his work, high professionalism, and attention to detail. Ali is highly regarded by Mining3 executive staff and is a valuable asset at Mining3.

Maddox Mawondo**Geotechnical Engineer at Anglo American**

Ali is one of the best engineers around. He has a way of understanding complicated problems and coming up with simple solutions to their problems. As my Mine Ventilation tutor, he simplified teaching and was always available and happy to provide further assistance. He is committed to his work and shows professionalism in his career. Ali has a lot of respect for students, fellow professionals, and the people around him. One of the best kind-hearted human beings around.

Cindy Hong**Mining Engineer at BHP**

Dr. Ali Soofastaei is a very dedicated teacher at the University of Queensland. He has a caring nature and likes to look after students. He also has good knowledge of underground ventilation and mechanics. In addition, he provides good feedback, which helps students understand concepts and reasons. Ali was my teacher for ventilation.

Reza Safaei**BEng, MEng, MIEAust, Senior Project Engineer, Civil and Infrastructure, Shire of Serpentine Jarrahdale**

Ali is a highly commendable and extremely likable, well-presented individual. I had the pleasure of working closely with Ali for over four years, and my feedback for Ali was never short of excellent. I recommend Ali as a top Engineer and someone who would be an asset to any business.

Amin Kamyar**Specialist, Asset Engineering at Thiess**

I had the opportunity to know Ali when I started my Ph.D. in the School of Mechanical and Mining Engineering in 2015. From the beginning, his teamwork, organizational skills, and professionalism seemed quite intriguing. Due to his outstanding managerial skills and academic competency, he has been able to collaborate successfully on various projects. I have also observed his adequate supervision and mentoring for undergraduate and peer postgraduate students. Overall, he is a committed, inspiring member and a valuable asset to any organization.

Websites:

<https://www.soofastaei.net/>

<https://www.soofastaei-business.com/>

<https://www.soofastaei-publications.com/>

<https://www.soofastaei-educations.com/>

