

Modeling, Simulation & Optimization for Sustainable Mining Systems

Understanding dynamics of mining community acceptance to reduce socio-political risks

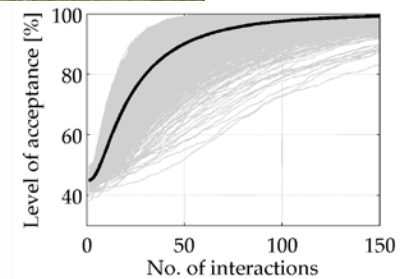
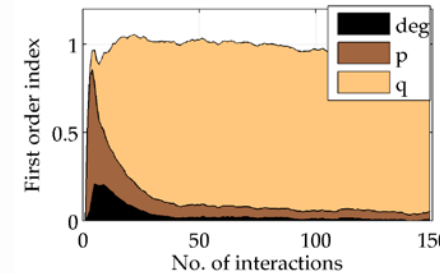
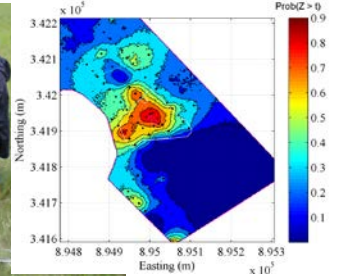
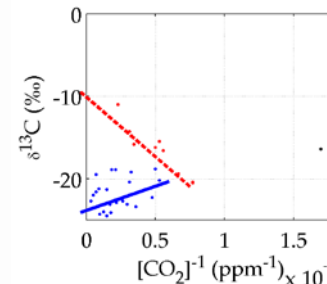
- Use discrete choice theory, social network models & ABM to study mining community acceptance
- Facilitate sustainable mine designs that reduce socio-political risk

Energy efficiency of mining systems

- Model effect of operators on energy efficiency of mining equipment

Optimization applications in mining

- Algorithms for solving optimization problems arising in mining including mine sequencing problems (problems with large precedence constraints)



Applying computer simulation and optimization to make mining systems sustainable

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- US Securities & Exchange Commission
- US Department of Defense
- US Department of Interior (Office of Surface Mining, Reclamation & Enforcement)
- Illinois Clean Coal Institute

Keywords

- #Mining, #Sustainability, #MinePlanning, #Geostatistics, #EnergyEfficiency, #StakeholderAnalysis, #DiscreteChoiceTheory, #ABM, #Optimization, #BranchAndCut, #BranchAndBound, #GradientSearch

Recognitions

- Academic Fellow, US Securities & Exchange Commission
- 2012-2014 Chair, Sustainable Dev. Committee, SME
- 3 times Missouri S&T Outstanding Teaching Award