Use of core imagery in modelling geometallurgical properties

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Ore Body Knowledge

- Size is important
- Grade is important

**But so is......**

- Throughput
- Recovery
- Product quality
- Geotechnical aspects
- Environmental
Continuation across the mining value chain

- Geoscience Data
  - Project Generation
  - Data Inputs

- Geology
  - Exploration Model
  - Resource Model

- Mining
  - Block Model
  - Blast model
  - Geotech Model

- Process
  - Production Model
  - Comminution Model
Advancing the use of drill core

‘Human observation of core’
• Multiple personnel involved over many years
• Domaining is interpretative and may not be related to process performance.
• Some minerals not easily identified by eye
• What are the critical data to capture?

‘Physical tests’
• UCS, A*b, BWi
• Sample selection is subjective, often biased toward intact rock
• Test work influenced by discontinuities in the core
• Often one physical test per ‘x’ million tonnes
• The flow sheet design is based on a sample set that may not represent the actual variability of the orebody both numerically and any mining sequence.
Hyperspectral Core Scanning
Predicting Comminution Behaviors

Database (Images)

Texture Analysis and Classification

Calibrate texture classes with processing attributes

Physical testwork for processing attributes
Predicting Comminution Behaviors

- Textual analysis potentially provides more accurate capture of processing variability
- Derived with less physical test work
Opportunity

Our objective
• Leverage hyperspectral data/information using image textural analysis and adaptive learning to:
  • Predict extraction related attributes downhole
  • Create 3D spatial representation of extraction attributes
  • Create spatial representation of processing performance knowledge
  • Generate exploration relevant information in the process

Outcome
• Better risk management, planning and decisions in project development;
• Minimisation of surprises and technical delays in project development;
• Reduces ramp up times and risks.
Examples

Example with UCS but could be any parameter such as A*b, Bwi etc
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