CREATING THE NEW STANDARD
AI AND THE FUTURE OF SELF-HEALING MACHINES IN MINING

RICARDO LUDEKE
Kriterion is AI for asset management

health & performance
ABOUT KRITERION

OUR TEAM

The Kriterion team combines 90+ years of business experience with innovative and cutting edge technology.

Our team consists of Engineers, Statisticians, Accountants and Multi-industry Executives with a synergy that sets us apart from competitors.

Wihan Booysen
Director of Artificial Intelligence

Ricardo Ludeke
Director of Engineering & Operations

Cedric Oeldorf
Data Scientist

Ernst Dreyer
Director

Wim Booysen
Managing Director

Ian Theron
Director
THE WHY

IT

INDUSTRY 4.0

OT
WHAT AI IS NOT

✗ AI is just a bunch of human defined rules
✗ AI is a black box and can’t be trusted
✗ AI will replace humans
✗ AI is a distant reality
WHAT AI IS

✓ AI learns from examples, not from defined rules
✓ AI is an interpretable tool
✓ AI will empower human decision making
✓ AI is a reality
WHAT AI IS FOR **KRITERION**

**ACTIONABLE INTELLIGENCE**

**AUGMENTED INTELLIGENCE**

**AUTOMATED INTELLIGENCE**
AI FOR SELF-HEALING MACHINES

- Failure Prediction
- Asset Availability Maximisation
- Operator Productivity
- Operator Training
- Parts Logistics
- Maintainance Scheduling
- Health & Performance Management
- Manage Cost of Ownership
- Holistic View of Asset Health
- Prognosis
- Detection
- Diagnosis

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CERBERUS INTELLIGENT CONDITION MONITORING

ASSET DEGRADATION TRACKING | SENTINEL
Provides a holistic view of asset degradation

ASSET ONLINE FAULT DETECTION | SCOUT
Identify anomalous behaviour and preceding sequence of events

ASSET REMAINING USEFUL LIFE | VANGUARD
Enhance Asset Degradation Tracking by predicting time to failure

ASSET CONDITION DIAGNOSIS | RECON
Failure mode and remedy prediction

CERBERUS ICMS

KRITERION PLATFORM™
REACTIVE ASSET MANAGEMENT

- **ONLY 28% OF MAINTENANCE IS PLANNED OR SCHEDULED**
- **UNSCHEDULED MAINTENANCE CAUSES PRODUCTION LOSSES:**
  - 12-72 HR DELAY IN INTERVENTION
- **RELY ON HUMAN DOMAIN KNOWLEDGE FOR 100% OF INSIGHTS GENERATED**
- **RELIANCE ON HUMAN INSIGHT RESULTS IN 60-70% OF DATA UNUTILISED**
- **NO VIEW OF DEGRADATION SEVERITY OR REMAINING USEFUL LIFE**
- **MINIMUM RISK MITIGATION**
PROACTIVE ASSET MANAGEMENT

- More than 60% of maintenance is planned or scheduled
- Rely on AI for insights that drive efficient redeployment of staff
- Measure of severity enables real-time resource allocation
- Minimal production losses and efficient intervention in unscheduled maintenance
- 100% data utilised to drive decision making for financial outcomes
- Maintenance strategy with optimal risk mitigation
MAINTENANCE VALUE DRIVERS

UPTIME IMPROVEMENT: 9%

LIFETIME EXTENSION OF AGING ASSET: 20%

REDUCTION OF SAFETY, HEALTH, ENVIRONMENT & QUALITY RISKS: 14%

COST REDUCTION: 12%
Technologies, such as AI, are key enablers of growth.

Success = minimum operational disruption + maximum value generation.
HEALTH MONITORING
CASE STUDY

Context:

- Engine oil pressure decreases
- Oil filter pressure increases
- No diagnostic alarm triggered
- Operates at poor efficiency & with low oil pressure for 3 days
- Down for corrective maintenance
ARTIFICIAL INTELLIGENCE INSIGHT

Representation of “what the AI sees”

Understanding of asset operating conditions.

Ability to discover Failure Modes, perform Root Cause Analysis and predict relevant remedy. Prioritise maintenance events and make human analyst more efficient.