Dark, dirty, and dangerous. Sweltering, messy, and loud.
3000 rock-bound feet below the daylight.
It's 24 more hours of...

the daily GRIND

The perfect place for tough, reliable, NREC-enabled
ROBOTS

ENGINEERING THE FUTURE OF ROBOTICS
NREC transforms mining operations with rugged, reliable robotic technologies

- Automated mining vehicles & equipment
- Operator assistance / Remote operation
- GPS-free localization
- Vision-based inspection systems
- Sensor systems that see through dust
- Robots & sensors for mine mapping / exploration

Increase Productivity & Efficiency
- Optimize mining processes and equipment operation
- Precisely guide drills, miners and shearers to maximize extraction from the ore body
- Operate day and night
- Generate 3D maps of underground mines

Improve Safety
- Remotely supervise and operate mining equipment from a safe location, away from machines and hazards
- Obey safety rules around personnel and equipment
- Track miners’ locations on the surface and underground
- Consistent, never-tired robotics technologies can reduce human errors

Reduce Operation & Extraction Costs
- Operate equipment within manufacturer specifications, minimizing wear and tear
- Detect failures in mining equipment (such as conveyor belts) before they occur
- Continuously monitor operations (such as fragmentation) to lower waste and reduce costs
- Prevent vehicles and machines from driving over debris that could cause tire or equipment damage

Real World Applications

Autonomous Haulage System
NREC and Caterpillar’s Autonomous Haulage System (AHS) is a complete, next-generation haulage solution that enables CAT’s autonomous, off-highway haul trucks to work safely and productively at busy mine sites. Currently, AHS trucks are running 24/7 at two Australian surface mine sites.

Conveyor Belt Inspection for Failure Prevention
NREC’s conveyor belt inspection systems detect mechanical and vulcanized splice failures before they occur. Deteriorating splices can be fixed during scheduled belt downtime, saving hundreds of thousands of dollars in lost productivity. This system is currently in use at more than 15 underground mines.

Mobile Mine Mapping
NREC’s lightweight, low power tunnel mapping system mounts on a small robot. As the robot moves, the system fuses stereo visual odometry with ladar localization to generate a 3D map on the fly. It’s faster and less expensive than current mine mapping methods and produces highly accurate maps of underground tunnels.

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Robots Institute

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