Using AI to Generate

Mining Algorithms

Mining is a critical element of the economies of Saskatchewan and Canada. Uranium mining is especially important to people in the North, Indigenous peoples, and the Saskatoon Region. Cameco is a world leader in developing uranium mining technologies and collaborates with SMEs and academics in an innovation ecosystem to bring such technologies into production.

Cameco mines some of the highest-grade uranium ore in the world at Cigar Lake. To do so, they have developed unique mining methods and systems around a proprietary "Jet Boring System" (JBS) program. Cameco is a leader in mechanized hard-rock mining technology and continues to innovate by seeking to automate and adapt remote sensor technology for jet boring. Automation and adopting Internet of Things strategies generate a large amount of data. The scope of this project included understanding and analyzing historical geological and geophysical data, digitizing and mapping it and utilizing rules-based machine learning techniques to improve the mining method. Through historical validation, researchers created predictive tools to drive jet bore settings as well as cutting, mixing, and mill feed recipes. Such tools could optimize bottom-to-top (BtT) output in a safer and cost reduced environment.

This work focused on the data that drives the optimization and automation of the jet boring systems in a form of machine learning. This primarily involved working on automating the creation of the JBS "recipes". The recipes are a set of step-by-step instructions. In Saskatchewan, any increase in efficiency and optimization can have a significant commercial impact for Cameco, their workforce, and their supply chain & mining associates.

Proponent: Cameco & Saskatchewan Polytechnic
Project Duration: July 2020 to April 2022
Project Cost: $106,667
        IMII Contribution: $ 48,000
        Mitacs: $ 58,667