International Fine Particle Research Institute

Project Brief

AI-powered Milling Expert System for Manufacturing

Utilize existing/available size reduction models and knowledge combined with hybrid AI methodology to create an APP with the capability to semi-quantitatively direct/guide/improve operation, troubleshooting, and optimization of mills and mill circuits. Starting from mill type, material characteristics and known current operation performance, demonstrate how hybrid AI modeling can be used to efficiently build an (mobile) expert system.

The primary objective of this project is to learn from and demonstrate the application of modern AI technologies to capture and utilize process data and human expertise in an expert system that can be used by process operators and engineering staff. The steps, techniques and libraries used in the process should be documented and shared with the IFPRI, so members can learn how to effectively apply AI in their own environment. The final format of the expert system should be an easy-to-use tool (APP) that can be used on the shop floor. Ideally the APP can learn from user supplied data and improve as it is used.

Milling is selected as a demonstration case. Inputs to the expert system are mill type and configuration, relevant material properties, and operating conditions. Outputs include size distribution, power utilization, and throughput. The systems should facilitate "what if" questions aimed at improving performance and diagnosing processing issues.