The Application of Data Fusion Algorithms and Machine Learning to Increase Orebody Knowledge

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Data fusion ore tracking algorithms fuse geospatial geological data with historical downstream production data to develop site-specific geometallurgy, product quality and material handing models using supervised machine learning. The term “orebody learning” has been defined to describe the process of developing site-specific machine learning models from production data from across the mine value chain. The paper will demonstrate the application of orebody learning through a series of six case studies from a wide range of deposits from around the world. Over the past five years mining operations have extended the application of orebody learning to include optimisation of blasting designs and set points for digging, crushing, grinding and flotation recovery for a range of orebodies including; haematite, magnetite, epithermal gold, and coal overburden removal. The paper will also explore the potential for incorporating optimised designs and set points into the geology model to further expand orebody knowledge and capitalise on geological data investments for geology driven mine value chain optimisation.