Machine Sensing for Mining Optimization

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In this talk, I will present some of the recent research activities in the Centre for Intelligent Mining Systems (CIMS) on applying machine sensing technologies to the optimization of oil sand mining operations. Much of the research effort is concerned with the development of the capability to accurately measure the sizes of ore fragments as they are processed and moved along the production pipeline. The research directions of CIMS will be first highlighted, followed by a description of our current research in two specific areas, namely, adaptive algorithms for image segmentation and the use of image statistics for object size characterization. Adaptive algorithms are necessitated by the demanding environment of outdoor Northern Alberta, 24/7, under all weather conditions, whereas the study of image statistics points to the possibility of acquiring ore size information without the difficult step of segmentation. We believe that oil sand mining creates both challenges to - and opportunities for - the machine sensing community and, at the same time, our research at CIMS demonstrates the relevance of our research community in both industrial and economical terms.