

**Title:** Distributed multi-UAV optimal path planning for surveying open surface minefields  
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Modern mining operations require real-time knowledge of the area being mined, and photogrammetry is a reliable way to obtain this information. While satellite images and high-altitude aerial photographs provide a broad overview of the field, they have limitations in terms of detail, particularly in understanding the extent of damage to the surrounding rock strata. To ensure both the safety of the mining crew and economic viability, it is crucial to monitor the topographical status of the surrounding rocks, which requires a closer look at the scene. To avoid the additional costs, risks, and time associated with deploying human teams for this task, multi-UAV teams can be used to monitor an open cast minefield area. **The deployment of these UAVs teams can be based on point of interest (POI) extracted from satellite imagery, and each cluster of POIs can be assigned a single UAV (University of California, Irvine). Terrain following and local path planning are developed to facilitate this process, and a simulation environment is created to evaluate realistic scenarios (IHFC).** Furthermore, fundamental research problems related to data-driven UAV modeling and convergent tracking control policy design using Contraction Theory will be explored in this context.



A landslide in open pit mine. Source: <http://www.mining.com/bingham-47835/>

