

# Newmont Computer Vision for Core Photography

Proposal for Colorado School of Mines, 2022

Client:

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## Introduction

Newmont as a leading exploration and gold mining company would like to develop a program to use **Computer Vision** to quantify various features found in drill core that human core loggers struggle with. Being able to have quantitative measures of mineral percentages and sizes would vastly improve the ability to create geological models from real, empirical data. Currently individual loggers visually estimate these features and you can find logging disparities of five to ten percent between loggers and even with the same logger over time. **Computer Vision** is an excellent tool for classifying these items as has been demonstrated in several papers (links below).

## Objectives

Ideally the computer vision tool would run on the core photos shortly after they were captured with results then fed to the internal database software. Data compositing will be a critical step in this as raw data exported by pixel will not be useful, so it will need to be collated into from and to depth intervals by drill hole. Working with the Regional Chief Geologist a compositing criteria will need to be developed then applied to the output. E.G. No samples smaller than 0.5 cm, with a minimum of 0.3% below target value and a maximum of 0.3% above.



Papers for reference:

<https://www.sciencedirect.com/science/article/pii/S1674987120300931>

<https://pyimagesearch.com/2015/09/28/implementing-the-max-rgb-filter-in-opencv/>

<http://14.139.186.253/2354/1/67747.pdf>

<https://ieeexplore.ieee.org/document/5580566>

<https://www.sciencedirect.com/science/article/abs/pii/S0892687511001488>

## Work Environment

The team can manage and work on the project from anywhere, but anticipate a number of face-to-face meetings and frequent electronic communication.