

# Imaged Reality

## Project Proposal: Desktop Application for Batch Core Extraction from Drill Core Tray Images

### Company Background

We built our platform for a purpose: to enable geologists and engineers around the world to study locations that they couldn't visit in person while connecting expertise and data in an immersive environment. Imaged Reality comprises an internationally diverse team of experts in geology, software development and gaming technologies.

Today this is a reality. We are partnering with experts to bring their knowledge wherever it is needed, with the help of our immersive technology that brings the landscape to life. Whether you're working in industry, training or academia, we can help you to leverage the power of virtual reality to work in a safer, smarter and more inclusive, innovative way. See our website [here](#).

### Problem Description

Geologists frequently face the challenge of digitizing their physical drill cores, which are typically stored in trays of a fixed length. Each tray can contain multiple cores of equal length. The digitization process commonly involves capturing top-down photos of these trays using a DSLR camera.. However, to work effectively with applications such as Imaged Reality's Core Explorer, where individual cores are stacked to reconstruct the entire well, it is necessary to extract individual core photos from the tray photos.

Given that a single well can have hundreds or even thousands of tray photos, manually cropping and extracting each core is a labor-intensive and time-consuming process for geologists.

### Solution Proposal

To address this problem, we propose the development of a desktop application using .NET, specifically leveraging the Avalonia framework for the user interface. This application aims to streamline the digitization process by enabling geologists to batch process their drill core images efficiently.

#### Key Features and Functionalities:

- 1. Image Import and Management:**
  - Allow users to import a collection of drill core images stored in trays.
  - Provide a user-friendly interface for managing and organizing these images in wells.
- 2. Cutting Mask Template Creation:**
  - Enable users to create a cutting mask template by drawing rectangles around each individual core in one tray image.
  - This mask will serve as a template for all other images, reducing the need for repetitive manual cropping.
- 3. Batch Processing:**
  - Apply the cutting mask template to the entire collection of images.

- Automate the extraction of individual core images from each tray photo, significantly speeding up the digitization process.
- 4. Depth Referencing Tools:**
- Implement tools to determine and input the top and bottom depths for each image.
  - Ensure that each extracted core image is accurately depth-referenced, maintaining the integrity of geological data.
- 5. Output and Storage:**
- Save the extracted individual core images to disk with appropriate depth references.
  - Provide options for organizing and exporting these images in a format compatible with applications like Core Explorer.

## **Student Requirements**

Experience with .NET and the MVVM design pattern development is strongly recommended. Specific experience with Avalonia or WPF would be nice-to-have, but is not a requirement. The students will assign intellectual property rights to Imaged Reality for their work and all artifacts produced.

## **Mentorship and Support**

Our company is committed to providing comprehensive guidance and support to the students undertaking this project. We will offer weekly catch-up meetings to ensure steady progress and address any challenges that arise. Our team will be available to provide mentorship, share industry insights, and offer technical assistance, ensuring that the project is delivered successfully. This project presents a unique opportunity for students to work on a real-world problem, gain valuable experience, and make a meaningful contribution to the field of geology.