

Mars has long captivated scientists eager to understand its geology, atmosphere, and potential for life. My project focuses on developing a Python-based software tool to analyze and categorize images from the Mars Curiosity Rover, helping researchers detect and document surface changes over time. By automating image analysis, the program reduces the need for manual review and enhances accuracy in identifying patterns, such as landslides or wind-driven sediment movement. A key feature of the software is its ability to track changes over time, allowing researchers to pinpoint when shifts occur and generate reports for further study. Future updates will incorporate environmental data like atmospheric pressure and temperature to provide deeper insights into these changes.

This project aligns with existing research that uses high-resolution imagery to monitor Martian surface activity. While previous studies have focused on manually tracking surface changes, my software streamlines this process with machine learning and automation. It builds upon current methods by categorizing landforms and eventually integrating environmental data to help explain why these changes happen. Future versions of the software could facilitate collaboration among researchers, making it easier to share findings and refine analyses. By automating complex tasks and improving efficiency, this tool contributes to ongoing Mars exploration efforts and helps uncover the dynamic processes shaping the Red Planet.