

Abstract Submitted  
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**Defect Detection in Superconducting Radiofrequency Cavity Surface Using C++ and OpenCV** SAMANTHA OSWALD, University of Wisconsin - River Falls, THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY COLLABORATION — Thomas Jefferson National Accelerator Facility (TJNAF) uses superconducting radiofrequency (SRF) cavities to accelerate an electron beam. If these cavities have a small particle or defect, it can degrade the performance of the cavity. The problem at hand is inspecting the cavity for defects, little bubbles of niobium on the surface of the cavity. Thousands of pictures have to be taken of a single cavity and then looked through to see how many defects were found. A C++ program with Open Source Computer Vision (OpenCV) was constructed to reduce the number of hours searching through the images and finds all the defects. Using this code, the SRF group is now able to use the code to identify defects in on-going tests of SRF cavities. Real time detection is the next step so that instead of taking pictures when looking at the cavity, the camera will detect all the defects.

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