X-ray system demonstrator

A web application is being developed to control and analyze X-ray detectors, aimed at comparing X-ray imaging chains in an application-oriented manner. This master's thesis, conducted by Jon Kunz in collaboration with Comet AG, establishes the basic interfaces of a highly flexible imaging environment and underscores the challenges associated with integrating detectors.

Introduction

Comet AG in Flamatt possesses extensive experience in developing X-ray tubes for technical applications. The demand for X-ray systems for quality control across various industries, including battery manufacturing, is on the rise. This project is centered on developing a web application that enables the efficient control and evaluation of X-ray detectors, demonstrating the functionality of the X-ray tubes in conjunction with the detectors in real time.

Goal

A user-friendly web application is being developed for an application laboratory, allowing customers to test the performance of X-ray tubes with various detectors tailored to their specific needs. This application facilitates the rapid modification of detector settings, enabling immediate comparison of results with different tubes and should help Comet AG to further deepen their knowledge in the integration and use of X-ray detectors.

Method

The system is built on Django, a web application framework that supports complex data and user management. It integrates a specific X-ray detector: a flat-panel detector from Varex. Special attention is given to the flexibility of the test environment, ensuring that the system can be swiftly adapted to diverse customer requirements and that new detectors can be easily incorporated into the existing application in the future. In addition to detector control, the foundation for image processing, data storage, and image management is also being developed.

Result

The implemented software lays a solid groundwork for the future integration of additional detectors and evaluation methods. It has been demonstrated that each detector type has unique requirements and interfaces, and that integrating the associated software can be both time-consuming and complex.

Jon Elias Kunz
unjon.zk@gmail.com
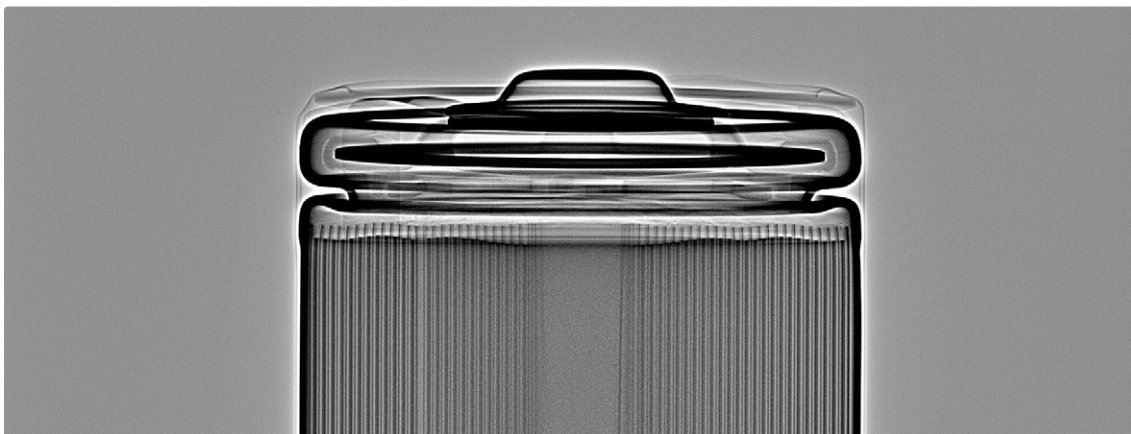
X-ray image of a cylindrical battery cell.