Real-Time Integrated Weld Analyzer SHUBHAM KUKREJA, University of Windsor — Resistance spot welding is a process in which metal plates at contact are joined by the heat obtained from resistance to electric current. As the stack thickness of metal plates increase, it is very difficult to evaluate the quality of a spot weld using destructive testing. Therefore, ultrasonic imaging is an excellent non-destructive testing solution. Real-Time Integrated Weld Analyzer (RIWA) is a combination of an advanced non-destructive ultrasonic system which provides a solution to evaluate resistance spot welds in real-time. The hardware of the system consists of a high frequency ultrasonic transducer that is integrated into the welding electrode, which generates ultrasonic waves that pass through the electrode cap into the welded plates. The key feature of the technology is that inspection of the weld is conducted during the real time monitoring of the welding process. The software of the system uses machine learning algorithms to detect key events such as melting onset, steel-steel interface disappearance, saturation and expulsion as the weld nugget grows. In this study, we will be presenting the process of preparing and labeling the ultrasonic B scans of spot welds as it is an important step for the implementation of machine learning algorithms.

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