

# **Recent Trends in Digital Radiography and CT**

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New Digital Detector Arrays, integrating and photon counting, enable an extraordinary increase of contrast sensitivity and inspection speed in comparison to film radiography. The increased sensitivity of digital detectors enables the efficient usage for dimensional measurements and functionality tests substituting manual maintenance. The digital measurement of wall thickness and corrosion status is state of the art in petrochemical industry. Dimensional measurements with Computed Tomography (CT) substitute Coordinate Measurement Machines. X-ray back scatter techniques have been applied in safety and security relevant applications with single sided access of source and detector. Computed tomography (CT) applications cover the range from nm to m scale. Small structures of integrated circuits are visualized and measured with lens based CT-systems or at synchrotrons. New X-ray tube concepts permit the reduction of measurement time in micro-radiography. Phase contrast and dark field imaging provides enhanced structure contrast in micro radiography and micro CT. Mobile computed tomography is applied for in-service radiographic crack detection and sizing of welded pipes in nuclear power plants and for NDT of large CFRP structures in aerospace applications as escalation technique. New specialized high energy CT devices have been laid out for inspection of complete cars before and after crash tests. High speed applications with flash tubes permit the 3D measurement of fast process dynamics including real time car crash visualization. Digital radiography techniques computed tomography and computed laminography designs are nowadays developed by numerical simulation before hardware construction. Robot based systems speed up the production and quality assurance. They permit the integration in the industry 4.0 concept with feedback to production and material treatment. CT is an efficient method for evaluation of additive manufactured parts in the smart factory of the future. Artificial intelligence is used so solve and speed up complex systems.