Abstract: Unlike steel, concrete, and most other construction material, wood has a highly complex, anisotropic, and variable internal structure. To use wood products (e.g. lumber, plywood, OSB, etc.) as structural members in building systems, engineers need to ensure (statistically) that the strength properties of each piece falls within specific design values. This is done by evaluating each piece after production and assigning it to a strength class (grade). Traditionally grading is done based on visual indicators of internal defects, which is inadequate for accurate strength prediction. Many of these internal defects can be examined or detected by studying the internal density variation within wood. This can be used for board grading automation and improvement, as well as log value optimization. X-ray and x-ray CT (Computed Tomography) are the best available technologies for scanning internal density structure of most materials. They are widely used for medical, security, and NDT (Non Destructive Testing) applications. In the wood products industry, they are used both for research and NDT. In this talk some background, basic principles, and applications of these technologies in the wood products industry are presented.

Biography: Zarin Pirouz is a senior scientist in the Lumber Manufacturing department at FPInnovations. She received both her BSc and MSc degrees in Electrical Engineering from the University of British Columbia. Her past experience includes network management, systems design, industrial automation, and software engineering in forest products, semiconductor, and wireless industries. She has more than 20 years of research and development experience covering many sensing, optimization, processing, and automation aspects of lumber manufacturing from the harvesting stage to lumber production, grading, and remanufacturing. Her recent research activities focus on using new developments in well-established sensing technologies such as x-ray/CT scanning, NIR (near Infrared) spectroscopy, thermal imaging, and GPR (Ground Penetrating Radar) to find solutions for specific problems in the wood products industry.