

AbstractID: 2571 Title: The Science of Image Quality: Early Concepts, Maturing Ideas, and New Research Problems

Our understanding of what determines image quality in medical imaging has evolved from the early radical ideas of Albert Rose in 1948 to modern task-dependent signal-detection theory. In between, many concepts such as the noise-equivalent quanta and detective quantum efficiency have moved from being novel approaches to mainstream metrics with international standards in both academic and industrial laboratories. This presentation will provide a brief historical description of how these concepts evolved and how they are used at present. While they have proved very useful, all Fourier-based metrics must be interpreted carefully when used to describe new digital technologies. Both the strengths and limitations of these methods will be summarized with an emphasis on some problems currently being investigated.