

Frontiers in Low Power Wireless Remote Viewing

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Abstract

Practical wireless sensors have been developed for many applications, however wireless remote imaging has yet to realize its full potential due to the relatively large amount of power required to capture and transmit the great volume of data in images. The development of imaging systems capable of recording high quality (surveillance grade) images and compressing and wirelessly transmitting image data on a tight energy budget will be a major step forward in the development of wireless remote viewing. Furthermore, integrated local processing of image data for motion detection and image recognition will contribute to reducing the amount of information that must be transmitted. In this presentation we discuss recent advances in CMOS image sensor design that reduce power consumption dramatically while simultaneously enhancing imager dynamic range. We also present a new method that integrates highly efficient block image

compression with the image sensor. As CMOS fabrication technology continues to follow the semiconductor industry roadmap ever greater amounts of computation may be integrated with imagers but aggressive design rules will present challenges to the CMOS image sensor designer. We conclude with a discussion of a vision for future ubiquitous remote viewing devices and the prospects and challenges for realizing the vision.

Author Biography

Mark F. Bocko is Professor and Chair of Electrical and Computer Engineering and Professor of Physics at the University of Rochester in Rochester, NY (USA). He has made contributions to several fields including the quantum limits of weak force measurement, superconducting electronics, superconducting quantum computing, audio signal processing and most recently CMOS image sensors. He is a member of the American Physical Society, the Acoustical Society of America and a Senior Member of the IEEE.