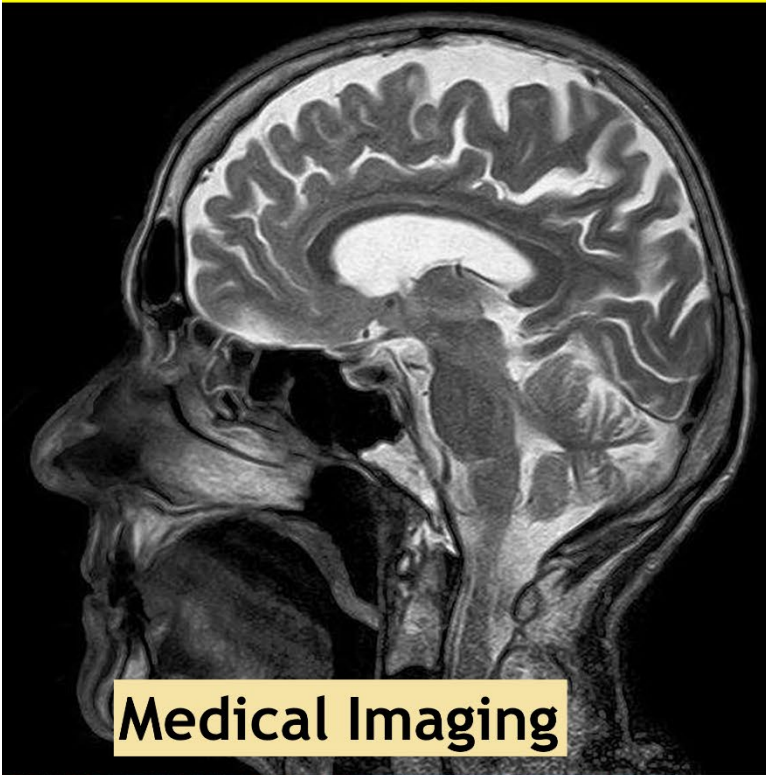
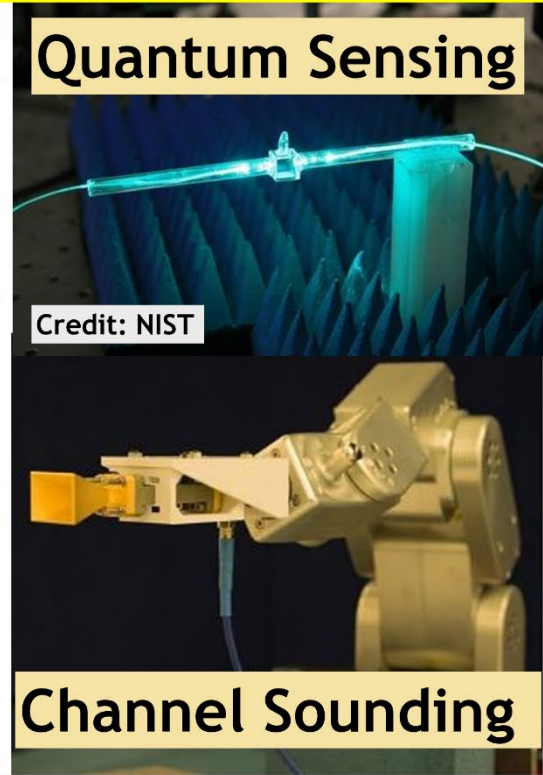


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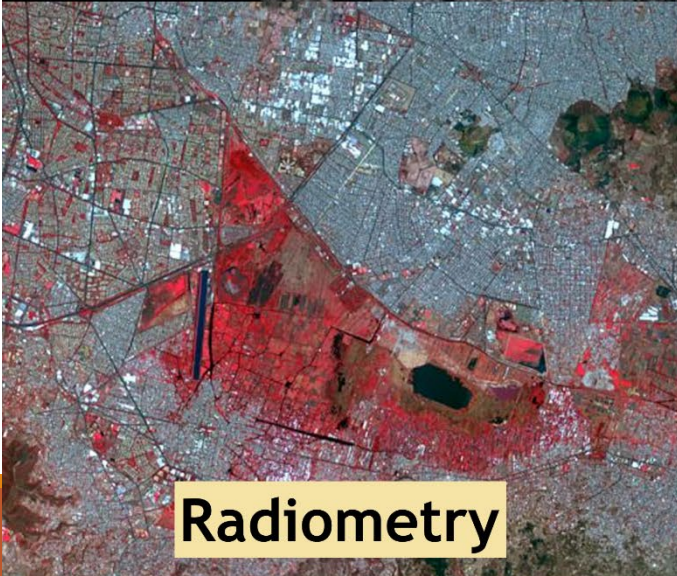
Medical Imaging



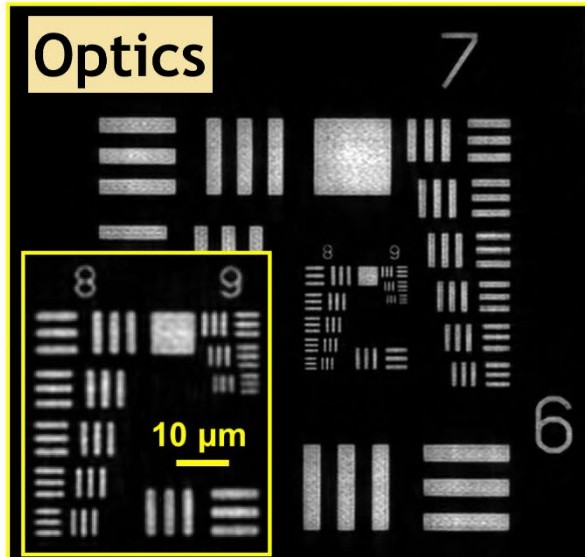
Quantum Sensing

Credit: NIST

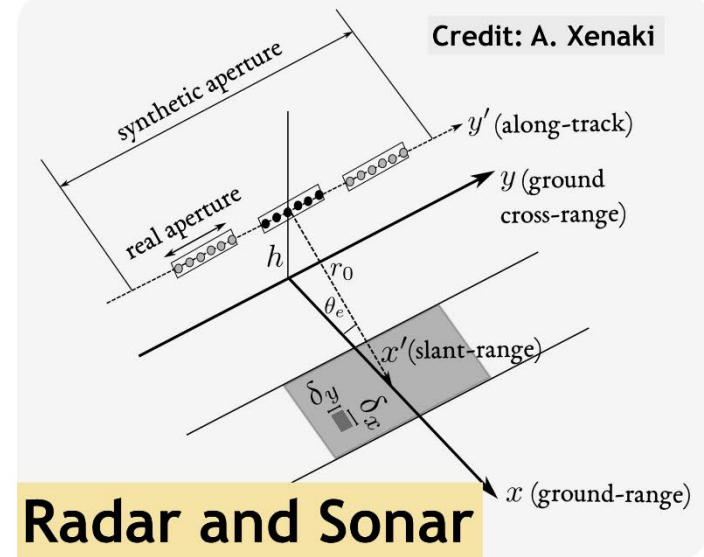
Channel Sounding



Radiometry



Optics



Credit: A. Xenaki

Radar and Sonar

P3339 Synthetic Aperture Radiometry Working Group

APRIL 26, 2024

P. VOURAS – FILLING IN FOR B. SEQUEIRA AND C. NAFORNITA

Sections 1 and 2

1. Background and Introduction
2. Single-channel radiometer
 - a. Architectures and trade-offs with attention to power measurement
 - b. Impairments
 - Inter-stage impedance mismatch
 - Amplification
 - Distortion (nonlinear, group delay, etc.)
 - Noise (additive, multiplicative, line, etc.)
 - Heterodyne
 - Image noise
 - Intermodulation products
 - Sampling
 - Amplitude quantization (incidental correlation and other)
 - Temporal quantization
 - Linearity
 - Artifacts (incidental correlation at subharmonics, and anti-aliasing filter effects)

Sections 3 and 4

3. Multi-spectral radiometer

- a. Architectures and trade-offs
- b. Impairments
 - Channel-to-channel response mismatch
 - Coupling (crosstalk) between channels

4. Correlation radiometer

- a. Architectures and trade-offs
- b. Impairments
 - a. Channel-to-channel gain mismatch
 - b. Channel-to-channel phase mismatch
 - c. Coupling (crosstalk) between channels

Sections 5 and 6

5. Polarimetric radiometer
 - a. Architectures and trade-offs
 - b. Impairments
 - Channel-to-channel gain mismatch
 - Channel-to-channel phase mismatch
 - Coupling (crosstalk) between channels

6. Calibration (determination and application of corrections for systematic impairments and residual uncertainty analysis after correction)
 - a. Single-channel radiometer
 - b. Multi-spectral radiometer
 - c. Correlation radiometer
 - d. Polarimetric radiometer
 - e. Array of radiometers