Case #595

Efficient and Responsible Methods of Ground Penetrating Radar

Critical to the identification and repair of crumbling and unstable infrastructure is the use of ground penetrating radar systems to scan below the surface for dangers present. However, the FCC has mandated a limit on emissions by ground penetrating radar systems to prevent them from interfering with other important radio operations and licensed services. To ensure the continued use of this important tool in infrastructure maintenance, UVM researchers developed an apparatus that uses sampling methods that satisfy the limits set by the FCC to provide a practical and efficient method of probing for subsurface damage and condition assessments.

The technology uses full waveform digitization of the returning signals to significantly reduce the number of launch signals needed, allowing the amount of radiation emitted to stay within the limit set by the FCC while producing a robust detection signal. In addition, the intermittent, large, latent duty-cycle sampling allows the digitizer to be much less expensive to produce, since it replaces continuous sampling, which is excessive for this application. The system also easily scales at low cost to accommodate multi-antenna, multi-static testing for subsurface tomographic imaging.

Applications:

- Inspection for roadway damage.
- Military IED detection.
- Emergency search functions.
- Geological research.

Advantages:

- Low radar emission rate.
- Can run at highway speeds.
- Digitizer is less expensive than most.
- Low-cost multi-channel operation.

Intellectual Property and Development Status:

US Non-Provisional Application US20160259045A1
Looking for research and development partners and licensing opportunities.

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