

UVM Innovations

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Efficient and Responsible Methods of Ground Penetrating Radar

Case #595

Full waveform digitization and intermittent large-latent-duty-cycle sampling to provide a practical and efficient method of probing for subsurface damage and condition assessments.

Inventor:

[Dryver Huston](#)

Description:

Crumbling and unstable infrastructure in the United States has become an immediate threat to safety of citizens. Critical to the identification and repair of this infrastructure is the use of ground penetrating radar systems to scan below the surface for the dangers present. However, the Federal Communications Commission (FCC) has recently 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 Professor Dryver Huston has developed an apparatus that uses sampling methods that satisfy the limits set by the FCC in order to provide a practical and efficient method of probing for subsurface damage and condition assessments.

Professor Huston's 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 than those currently on the market, since they are usually designed for continuous sampling, which is excessive for this application. The system 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

Patent Information:

US non-provisional application filed.