

## Solopulse Radar (#7614)

*A signal processing technique that achieves cross-range imaging with a single, solitary radar pulse*

Solopulse digital signal processing, combined with digitized array hardware, produces a volumetric image within a range window field of view that spans azimuth and elevation dimensions. This new array signal processing technique achieves cross-range imaging with a single, solitary radar pulse, or said more simply, with a “solopulse.” Solopulse processing is efficient and effective, and provides a landmark technology that will empower many new computed imaging applications and capabilities in radar, terahertz sensing, medical imaging, seismology, sonar, etc.

### Benefits/Advantages

- Two or three dimensional radar imaging can be achieved with a single transmitted radar pulse.
- Radar Imaging can be achieved without sensor or object motion at beamwidth resolution.
- Resolution improves with sensor or object motion.
- Conventional radar scanning with beamforming is not required for searching.
- Solopulse works in both the near and far fields of an array sensor.
- Processing can be performed in real-time.

### Potential Commercial Applications

Solopulse will drive new capabilities in 1) radars that search, track and discriminate both stationary and moving objects in the air and on the ground, including objects such as isolated drones and swarms of drones; 2) radar sensors for self-driving cars; 3) hologram recording/reconstruction devices, and many other applications that rely on computed imaging.

### Background/Context for This Invention

“RADAR” was originally an acronym for RAdio Detection And Ranging; hence, the very name emphasizes the natural solution radar provides for down-range profiling. Cross-range profiling in radar, on the other hand, has long been a challenging problem. Georgia Tech offers a breakthrough solution called “Solopulse” for the cross-range detection problem in both azimuth and elevation that only requires the transmission of a single radar pulse.

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**More Information**

U.S. Application Filed - [US16/636494](#)

**Publications**

**For more information about this technology, please visit:**

<https://licensing.research.gatech.edu/technology/solopulse-radar>

Images:

The automated sequential delivery of multiple fluids. A varying number of delay gates imprinted in the branches are shown in the figure.

COVID-19 and flu saliva test on paper: (A) The automatic sequential delivery of multiple reagents required for virus test; (B) Water pouring into the device triggers the virus assay, allowing the presence of SARS-CoV-2 and influenza A & B viruses to be visually identified by the color changes in the corresponding detection spot

