

# FMCW Radar Sensors

## Competing technologies

### Infrared

Advantages: Good at detecting orthogonal and tangential movement, with wide field of view and low cost

Disadvantages: Poor at detecting radial movement, can have difficulty in diminished visibility conditions such as rain or dust, can not be used to detect range, direction, or speed of objects. Requires a high-quality transparent window for the sensor, making the system more difficult to conceal. The sensor can also be affected by dirt or moisture on the window or in the atmosphere.

### Ultrasound

Advantages: Relatively accurate at short ranges, triangulation possible, low cost

Disadvantages: Tends to have a very low range. Provides no velocity information. Requires a visible sensor. Can be influenced by environmental factors such as noise, wind and temperature

### Radar (pulsed)

Advantages: Proven technology with long history. Long detection ranges possible using high power systems. Can be designed to deal with nearby reflectors and interference relatively easily.

Disadvantages: High peak power output and radiation. Has difficulty with measurements at short ranges due to short signal travel time. More difficult to eliminate clutter. Can take time to “warm up”.

### Laser

Advantages: Highly directional. Quick start up and measurement. Excellent for range finding. More difficult to detect or jam. Relatively low cost.

Disadvantages: Can be affected by atmospheric conditions including fog, rain and temperature. Does not work well on all surfaces. Limited field of view can prevent detection of multiple targets.

Data subject to change without notice. Rev. A 2011 – 06 - 2011

# FMCW Radar Sensors

## Video/Cameras

Advantages: Highly flexible, can be programmed to recognize different objects, not just range and velocity. Sensors can be low cost.

Disadvantages: Requires clear field of view, can be affected by shadows or bad weather, etc... Requires complicated software and powerful hardware.