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Assignment # 1

Subject

Radar and Satellite Communication

Submitted

to

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(Q 1)

Tracking and parameter estimation of Radar?

Ans Ultrawide Band (UWB) radar is a promising method for reliable remote monitoring of vital signs. The use of multiple antennas at transmitter and receiver (MIMO) allows not only improved reliability but also better accuracy in localization and tracking of humans and their various types of movement.

* Parameter Estimation and Tracking Function.

⇒ After a target is initially detected, the radar must continue to detect the target.

⇒ Estimate target parameter from radar observations, Position, size, motion, etc.

⇒ Associate detection with specific target.

= Are all these nearby detections from same targets?

= Use range, angle, Doppler measurements.

= Predict where the target will be in the future.

use multiple observation to develop a more accurate filtered estimate of the target track.

* Radar Parameter Estimation



• Location

- Azimuth Angle
- Elevation Angle
- Range

• Size

- Amplitude (RCS)
- Radial Extent (Length)
- Cross Range Extent

• Motion

- Radial velocity
- Radial acceleration
- Rotation, Precession
- Ballistic coefficients

* Automatic Detection and Tracking Techniques

- Development of clutter rejection techniques and the digital revolution have enabled the successful development of these automatic detection and tracking techniques for Air Defence and Air Traffic control functions.

Target Detection:

- Adaptive threshold (CFAR) applied to each range, angle Doppler cell.

* Target Association

= Adjacent (range, angle) and Doppler) threshold crossing, are associated

= Range, angle(s) and Doppler of target are calculated from associated detection