

Radar Target Generation and Detection

- **Implementation steps for the 2D CFAR process.**
 - Implemented a nested for loop to loop over all the valid CUT (Cell Under Test) cells whereas leaving the edge cells that do not qualify to be CUT cells as they not have enough cells around them for training and guarding.
 - For each cell, the threshold is calculated by taking the mean of the training cells around them. If the amplitude of the CUT cell is greater than the threshold, then the element in the signal_cfar vector is updated with "1" in the corresponding index. Thus the signal_cfar vector is populated with filtered signal values.
- **Selection of Training, Guard cells and offset.**
 - From the 2D FFT graph, it can be seen that the signal is spread in approximately 12 cells in each side in range dimension and 20 cells in each side in Doppler dimension. By manually increasing the parameter's value by 1, iteratively, until the desired result is obtained, the final parameters are found.
- **Steps taken to suppress the non-thresholded cells at the edges.**
 - The signal_cfar vector of dimensions $N_r \times N_d$ is initialized with zeros, the elements in those indexes, that belong to the edges, which do not have a valid CUT cell, have zero amplitude by default.