RadHARSimulator V1 Instruction

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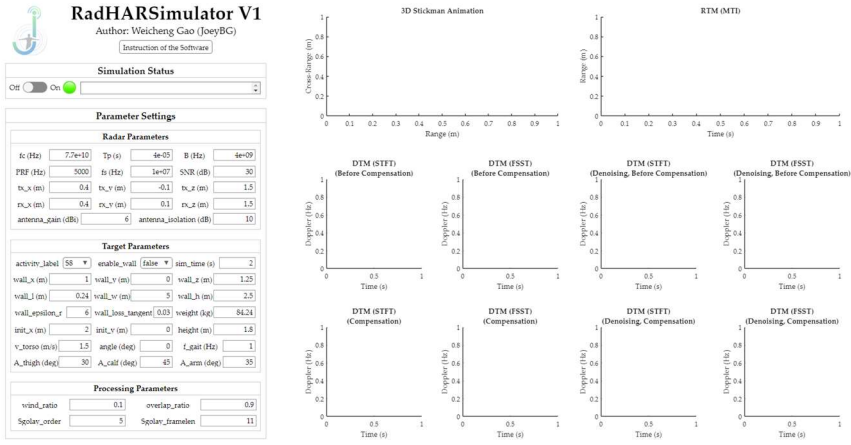
Interface



Information

This simulator provides an end-to-end simulation pipeline for **FMCW radar human activity recognition**, including **12 activities** with both **free-space** or **through-the-wall** scenario.

The processing chain includes:

1. A 3D stick figure animation where joint color represents RCS value, with wall, and antenna positions visualized.
2. MTI and pulse compression to generate the RTM.
3. Generation of DTMs (STFT/FSST, before/after Savitzky-Golay denoising) before bulk Doppler compensation.
4. Time-varying bulk Doppler compensation based on radial velocity of torso.
5. Generation of DTMs (STFT/FSST, before/after Savitzky-Golay denoising) After bulk Doppler compensation.
6. Entropy is calculated for the RTM and all DTMs.

All resulting data and images are stored to the running folder.

Input

All parameters are consolidated in the "Parameter Settings" panel.

'activity_label': 'S1': Stationary; 'S2': Punching; 'S3': Kicking; 'S4': Grabbing; 'S5': Sitting Down; 'S6': Standing Up; 'S7': Body Rotating; 'S8': Walking; 'S9': Sitting to Walking; 'S10': Walking to Sitting; 'S11': Falling to Walking; 'S12': Walking to Falling.

'enable_wall': 'false' for free-space simulation, and 'true' for through-the-wall simulation.

Other numerical parameters are explained in prompt windows in the software.

Output

1. 3D stickman animation with RCS coloring and wall visualization.
2. All parameter settings and raw echo.
3. RTM matrix and DTM matrices with their entropy values.
4. 9 plotted figures: RTM, 4 DTMs before compensation, 4 DTMs after compensation.