6G-RIC
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GEFÖRDERT VOM
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Real-time D-band sensing for human presence detection and gesture recognition

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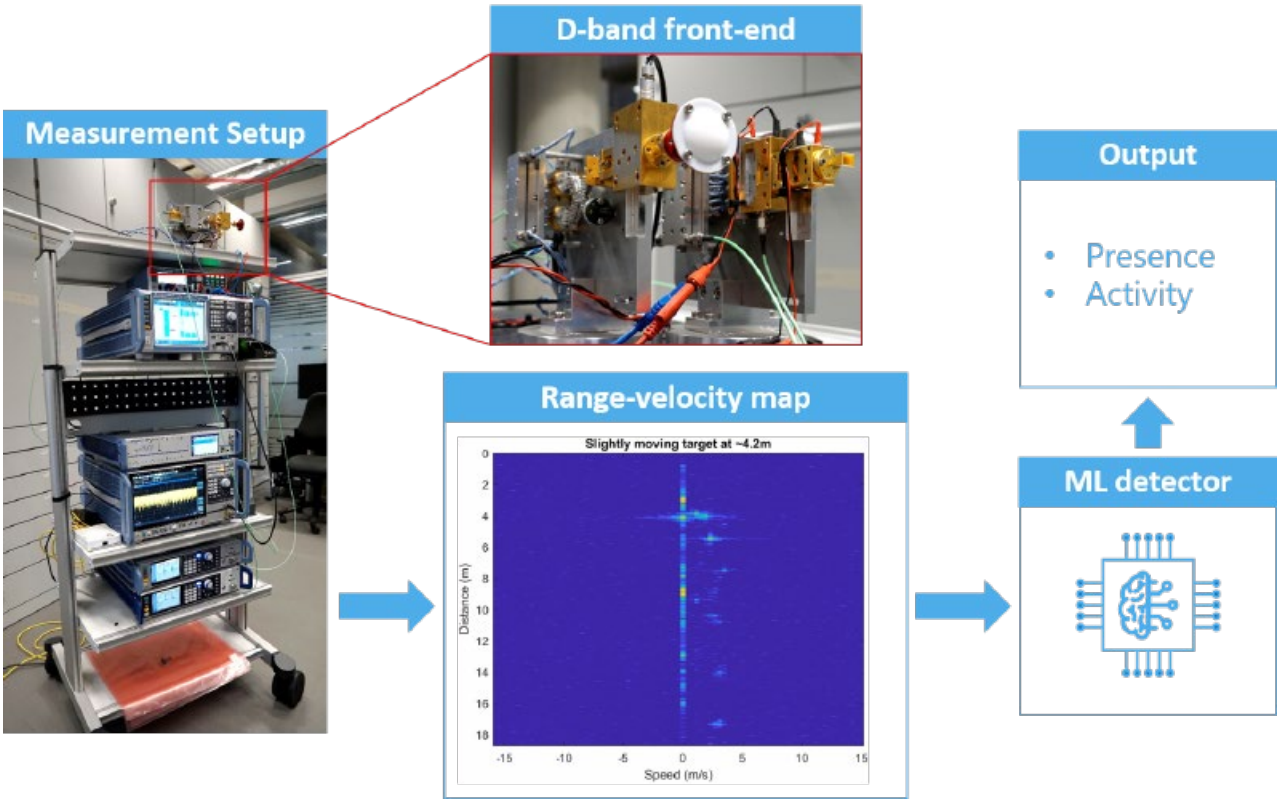
What opportunities does D-band offer for communications and sensing? Can integrated communication and sensing (ICAS) exploit advantages of sub-THz frequencies?



Measurement setup for sensing at 156 GHz with a 4 GHz bandwidth

KEY FINDINGS

The sub-THz frequencies offer significant potential for high-performance ICAS systems in future wireless standards like 6G and beyond. The wide available bandwidths can accommodate high data rates and provide superior sensing capabilities compared to existing bands, thus showing potential to drive high-performance ICAS systems in forthcoming 6G wireless standards. This demo explores D-band sensing at a 156 GHz carrier frequency with a 4 GHz bandwidth, achieving a range resolution of approximately 3.75 cm. The goal is to assess the feasibility of D-band sensing, where a machine learning (ML) algorithm, trained on measurement data, is employed for human presence detection and gesture recognition. The initial version of the demo focuses on detection of a hand-waving person, while future improvements will aim at distinguishing between different postures and more complex gestures.

S. Wittig et al., "Demonstration of a Real-Time Testbed for D-Band Integrated Sensing and Communication," MILCOM 2024 - 2024 IEEE Military Communications Conference (MILCOM), Washington, DC, USA, 2024, pp. 641-642,