PREFACE

Monitoring any public access site, military surveillance or rescue from disaster site is essential since the inception of civilians. In this direction, technology-driven proactive and faster alarming and response system have been developed by diversified research disciplines. In this regard, the modalities used for monitoring purposes need to be equipped with microwave based engineered advanced and smart capabilities due to its all-time operation capability, non-line of sight application and non-hazardous to the living being in the environment, in addition to being cost-effective in nature. However, living targets may exist in indoor environments of public access areas, which need to be monitored by the sensing systems. In this process, information regarding location of human and activities are more important as the human behavior is quite unpredictable.

In the present thesis, microwave-based ranging system capabilities have been explored for human being monitoring purposes. The SFCW radar system has been utilized to detect the human subject's location inside a rectangular region and detect its vital life signatures using the radar returns. For activity probing purposes, the concept of the micro-Doppler signature captured by a continuous wave (CW) radar has been utilized to classify the activity using the proposed method. Further, the activity separation has also been carried out from the mixed signature of multiple performers present in the radar field of view.

The author, time to time, has reported the present work part-wise at national and international forum including conferences and symposium as well as in the peer reviewed journals of international repute like Wiley International Journal of RF and Microwave Computer Added Engineering.

The author will consider his modest effort as a success if it proves to identify and track individuals from a group of walking people under the observation of microwave active or passive sensing systems for security reasons.