ABSTRACT

One of the methods to find victims in the disaster area is by utilizing the available cellular signal transmitted by the victim's mobile phone assuming that the victims are close to their mobile phones. This thesis develops a victim finding system (VFS) based on the availability of victims cellular signals within the coverage of the VFS device to lead the rescuers go to the direction closer to the victims.

This thesis assumes that in the post-disaster situation the cellular network is completely off, where the victim's mobile phones will then search the strongest available signal in the coverage area. The VFS transmits cellular signal and forces the victim's mobile phone within the VFS radius to connect to the VFS. This thesis uses Universal Software Radio Peripheral (USRP) for the implementation and evaluate the proposed VFS system in real-field environments.

The proposed system works well in the second telecommunication generation (2G), the third generation (3G), the forth generation (4G), and the band of fifth generation (5G) networks and has an ability to detect the mobile phones of victims in the disaster area within the range of 74 meters from the VFS device without high power amplifier (HPA). Furthermore, the proposed VFS can also identify the victims or users based on the mobile device identity.

Keywords: Software Defined Radio, OpenBTS, OpenBTS-UMTS, srsLTE, Disaster response, Mobile phone