integrating it with Cell tower data. Shown in Figure 17, the draggable pushpins are dynamically created on the map by retrieving the Cell Towers database from the SQL Server containing location code, range, network code as well as the latitude and longitude of the towers. The source code of this application is available in [93]

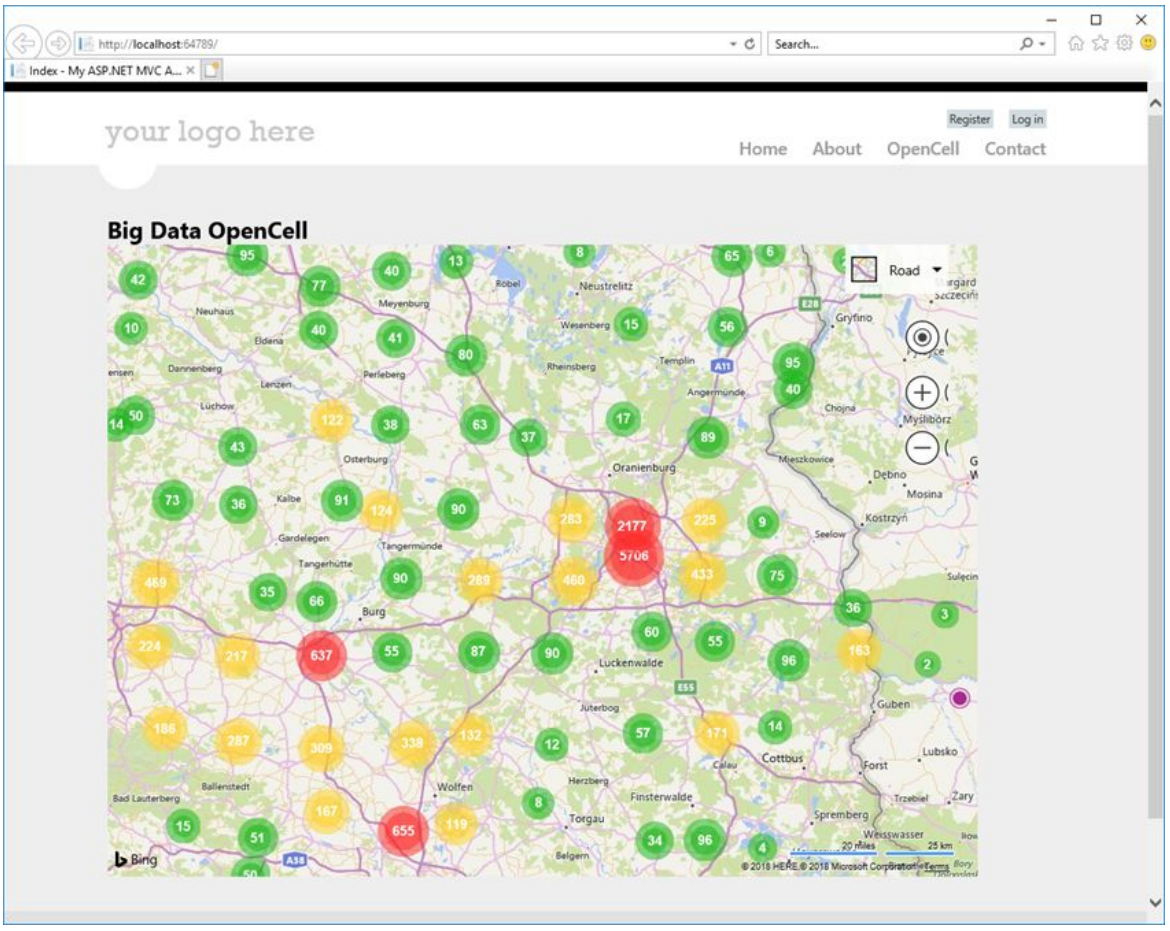

Figure 17. Clustering of OpenCellid Towers

Partial views were designed to create, edit, and view the geographic locations of the Cell towers. The interface is developed in CSharp using Model-View-Controller to create interfaces. The Bing Map is integrated in the application using Asynchronous JavaScript and XML (AJAX) and the JavaScript Object Notation (JSON) format has been used to serialize and transmit the structured data. The clustering was achieved by creating an instance of the ClusterLayer class and passing the pushpins data from the SQL Server for clustering and updating into the map.

4.4 Activity Classification

Activity classification is one of the emerging trends in the domain of data stream mining e.g. in healthcare, sports and security. The unlabeled raw data is acquired using accelerometer enabled wrist watches or from cell phone accelerometers. It is hypothesised that the raw activity patterns from the cell phones accelerometer could be used as unique fingerprints to identify users. In [9] a wrist-worn accelerometer was utilized to detect five daily activities i.e. walking, running, sitting, standing and lying. Concepts Drift in activity classification was studied in [10], the author claims that using Weighted modification of Naïve Bayes classifier can swiftly adapt itself to the current state of the stream without a need for an external Concept Drift detector. There are several applications of activity classification such as healthcare. For example, activity recognition has shown promising benefits in healthcare, the application includes health monitoring and identifying cause of diseases. Accurate quantification of daily physical activity and energy expenditure would advance science and assist with proper management of pathologies such as obesity, diabetes and cardiovascular diseases [94]. In a large scale activity analysis in UK Biobank 103,712 datasets were received (44.8% response), with a median wear-time of 6.9 days from participants aged 45–79, who were asked to wear accelerometers for seven days on their dominant wrist [95]. Their results shows that the overall physical activity is lower in older participants and age-related differences in activity are most prominent in the afternoon and evening.

5. CONCLUSION