

We model this space as a graph whose vertices represent rooms and whose edges represent adjacencies between rooms. Corridors and large spaces (e.g., atriums and cafeterias) are partitioned into smaller spaces so that each vertex represents an area of about the same size. The hospital graph allows us to approximate walking distances in the hospital by hop distances in the graph (see Figures 2.3 and 2.4). This discretization allows us to easily compute various distance-based characteristics of the hospital. The hospital graph was constructed manually using data from two sources provided by the UIHC: (i) a spreadsheet containing most of the rooms in the hospital along with their names, floor numbers, area in square feet, and purpose, (ii) architectural CAD drawings that showed blueprints of each of the floors. We manually (and painstakingly!) extracted room adjacencies from the CAD drawings and through a combination of manual and algorithmic efforts, we were also able to extract approximate 3-dimensional coordinates for all the vertices in the hospital graph (see Figure 2.5).

The graph we constructed has 19,554 vertices and 23,566 edges. Given the 3.2 million square foot area of the hospital, this implies that on average each vertex corresponds to 163.65 square feet in area (i.e., a 12.5 foot \times 12.5 foot room). Due to discrepancies between the hospital room spreadsheet and the hospital CAD drawings, the graph has a small number of small connected components and one “giant” component with 18,961 vertices and 23,442 edges. We delete the small components and take this giant component to be the *hospital graph* (see Figure 2.6). The hospital graph essentially overlays a metric space (induced by pairwise hop-distances between