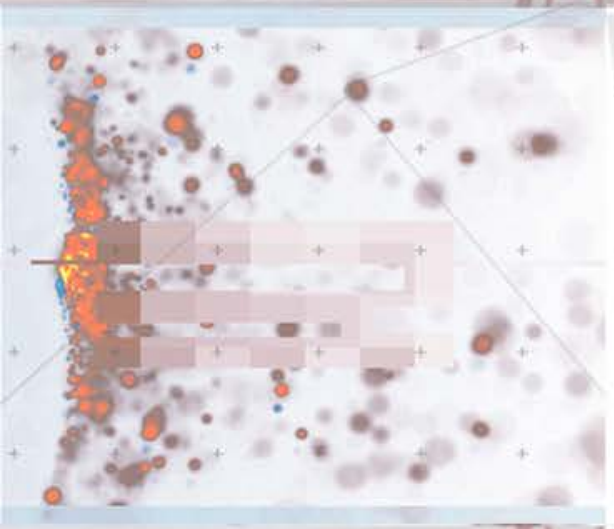

Session 5: Spectral Clustering

Question

- Which of the following statements about the graph Laplacian *L* are true?
  - The diagonal entries of *L* are always negative.
  - L is symmetric for an undirected graph.
  - If the three smallest eigenvalues of *L* are 0,0.1,0.2,0.22, then the graph has three connected components.
  - When the second eigenvalue, λ_2, of *L* is positive, the graph is connected.
- Answer:
  - The diagonal entries of *L* are always negative. **False**. The diagonal entries are always nonnegative since they are the degree of each node.
  - L is symmetric for an undirected graph. **True**
  - If the three smallest eigenvalues of *L* are 0,0.1,0.2,0.22, then the graph has three connected components. **False**. For G to have three connected components, the first three eigenvalues must all be 0.
  - When the second eigenvalue, λ_2, of *L* is positive, the graph is connected. **True**