Introduction

- Osteoarthritis – one of the main health issues among elderly population.
- One of its main effects is the degradation of articular cartilage.
- MRI is the leading imaging modality to quantify knee cartilage and detect deterioration.
- Segmentation of the cartilage tissue is an important step in this process.
Segmentation Methods Used

- Manual Segmentation
- Region Growing
- Active Shape Models
- Clustering Methods
- Graph Based Approaches
Clustering Methods

- Voxel Classification Approach
  - Fully automatic apart from initial learning stage
  - The steps used:
    - Grouping voxel values using an approximate nearest neighbor framework.
    - Iterative position adjustment to find the approximate location of the cartilage.
    - Use the position, intensity and geometry features to identify cartilage tissue
Graph Based Approaches

- Basic Graph Cut Algorithm
  - Each pixel is treated as a node in a graph
  - Each node is linked to its neighboring nodes, a strength value is assigned to each edge.
  - Groups of pixels are separated by ‘cutting’ the edges. Graph cut algorithms try to find the ‘cut’ giving least amount of edge strength loss and maximum edge strength within clusters.
References

Project Timeline

- Week 1-2: Implementation of Voxel Classification Approach

  -- Progress Presentation

- Week 3: Implementation of Graph Cut approach
- Week 4: Concluding the project by getting the final results and having a comparison between the given two methods.