XFEMM fixed problems

In XFEMM, it is problematic when nodes, segments or arc segments are overlapping because it tries to mesh these zero area regions and MATLAB fails. The following functions are added to “XFEMM.m” tool which make modifications to the “FemmProblem” struct (which keeps all information about the design geometry) and fix the above-mentioned problems:

1. removeExtraNodes – when there are several nodes that have the same coordinates, all extra nodes are removed and only one is left in the FemmProblem struct.
2. removeExtraOverlappingSegments – when two segments ideally overlap (end node coordinates of two segments are the same), extra segments are removed and only one is left in the FemmProblem struct.
3. removeExtraOverlappingArcSegments – when two arcs ideally overlap (end node coordinates of two segments and arc angles are the same), extra arcs are removed and only one is left in the FemmProblem struct.
4. removePartiallyOverlappingSegments – when two segments partially overlap (two segments may not have the same end coordinates, but still share the same region), these two segments are removed, and new interconnections are made so that new segments do not overlap with each other.
5. removePartiallyOverlappingArcSegments – when two arcs partially overlap (two arcs may not have the same end coordinates, but still share the same region), these two arcs are removed, and new interconnections are made so that new arcs do not overlap with each other.

After making drawings using XFEMM, a “removeOverlaps” function should be called that calls each above function in order and returns a modified “FemmProblem”struct.