

## CHAPTER XI

### CONCLUSION

This paper has presented a new *Constraint-Based Method* for creating continuous cartograms, that maintains map topology while maximizing shape recognition and minimizing area inaccuracy. Our method is an adapted relaxation technique, in which we achieve desired areas without regard to shape, and then utilize constrained dynamics to attempt to hold the areas fixed while shape is restored. The alternating relaxation process continues to transform the map at decreasing levels of coarseness over time until a converged solution is obtained.

The primary advantage of this method lies in its ability to retain region recognition, producing a cartogram that both minimizes region distortion while maximizing shape preservation. This innovative approach meets the capabilities of existing methods but incorporates user control over the result. The user can specify the balance between area and shape, as well as perform aesthetic modifications manually during the cartogram process by pinning down vertices to the map. Incorporation of this method within a geographical information system could provide a powerful tool for spatially visualizing the distribution of data.

This new method can open the doors for more widespread use of cartograms. We feel that we have demonstrated that our *Constraint-Based Method* makes a giant leap in quality over existing automatic methods, steering the cartogram further away from a map *distortion* and making it truly a useful map *transformation*.