

Spatial Data Mining: Where to from here?

*Brendon J. Woodford*¹

¹Department of Information Science
University of Otago, Dunedin, New Zealand
Phone: +64 3 479-8834 Fax: +64 3 479-8311
Email: bjwoodford@infoscience.otago.ac.nz

Presented at SIRC 2003 - The 15th Annual Colloquium of the Spatial Information Research Centre
University of Otago, Dunedin, New Zealand
December 1st-2rd 2003

ABSTRACT

The field of spatial data mining (Chawla, Shekhar, Wu & Ozesmi 2001), has been influenced by many other disciplines such as neural networks (Rumelhart, Hinton & Williams 1986), machine learning (Mitchell 1997), fuzzy systems (Zadeh 1965), and statistics (Sammon 1969).

Recently other methods and techniques have been developed that offer some advantages over the conventional methods that have been applied in the past. For example the Support Vector Machine (SVM) (Cortes & Vapnik 1995) is one technique that can identify clusters where it may be difficult to easily separate different regions and new learning systems have now been developed that address the problem of local versus global learning models for spatial data analysis (Gilardi 2002).

In this presentation we review the methods and techniques that have been previously employed for the purpose of spatial data mining and also introduce some new technologies that could be applied to this task.

Keywords and phrases: clustering, similarity metrics, machine learning, fuzzy systems

References

- Chawla, S., Shekhar, S., Wu, W. & Ozesmi, U. (2001). "Modeling Spatial Dependencies for Mining Geospatial Data: An Introduction" In H. J. Miller & J. Han (eds), *Geographic Data Mining and Knowledge Discovery*. Taylor and Francis.
- Cortes, C. & Vapnik, V. (1995). "Support-Vector Networks" *Machine Learning*. **20**(3): 273–297.
- Gilardi, N. (2002). "Local Machine Learning Models for Spatial Data Analysis" *Geographical Information and Decision Analysis*. **4**(1): 11–28.
- Mitchell, M. T. (1997). *Machine Learning*. MacGraw-Hill.
- Rumelhart, D. E., Hinton, G. E. & Williams, R. J. (1986). *Parallel Distributed Processing, Vols 1 and 2*. The MIT Press: Cambridge, MA.
- Sammon, J. W. (1969). "A Nonlinear Mapping for Data Structure Analysis" *IEEE Transactions on Computers*. **18**: 401–409.
- Zadeh, L. (1965). "Fuzzy Sets" *Information and Control*. **8**: 338–353.