Towards a R-centric architecture for multi purpose geographical analysis on heterogeneous multi-source data

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R provides an elegant and widely accepted platform with a rich function set for statistical data analysis, mathematical computations and flexible interactive graphics. The number of available R packages keeps growing at amazing speed, making it increasingly challenging for developers to deal with complex projects.

In particular, there is a big amount of packages related to spatial analysis in a broad sense encompassing spatial statistics, geometrical tools, maps management, ...

On the other hand, there has been some attempts in coupling/intergrating Statistical Systems with/in GIS. A thorough study showing the interest and the difficulties of integration of statistical and geographical information systems has been proposed in [1].

A complete and up to date reference adressing all this topics is provided by [2].

It is important to point out that some types of analysis require heavy and complex computations alternating between intensive use of data in the statistical and graphical analysis under the geographical information system.

We concentrate on a R-centric strategy and discuss the following requirements:

- Abstract data types that support the creation, access, and sharing of heterogeneous multi-source data
- Data coherency over coupled tools
- Management spatial or spatio-temporal data
- Database connectivity and web interface
- Integration with other softwares
- Robustness to data evolution
- Efficient vizualisation strategies

Some of this topics are adressed (conception and development of new R -types, possibility to extend the built-in functions,...) are adressed in the presentation.

References

[1] **de Andrade Neto P.R., Ribeiro P.J. and Fook K.D** (2005) Integration of Statistics and Geographic Information Systems VII Simpósio Brasileiro de Geoinformática, Campos de Jordão, Brasil, 20-23 novembro 2005, INPE,pp 139-155.

[2]**Bivand R.S., Pebesma E.J. and Gmez-Rubio V.** (2008) Applied Spatial Data Analysis with R. Springer, New York, 2008.