aRT: R-TerraLib API

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useR! 2006

Motivation

- Data collection mechanism
- Monitoring/surveillance systems
- Interplay between spatial statistics and GIS.
- Need for “automatic” data analysis and reports

Motivation

What these problems have in common?

- Citrus diseases
- mosquitos / dengue disease
- crimes within an urban area

Motivation

Some are from Venus, some are from Mars...

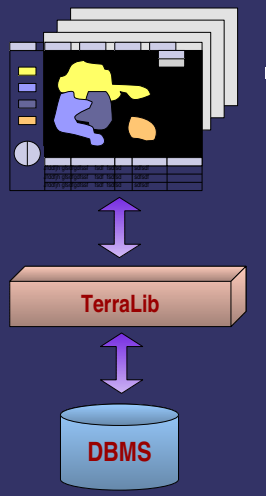
- Statisticians
- Subject matter scientists
- ways to exchange information and to deliver statistical expertise, results and technologies

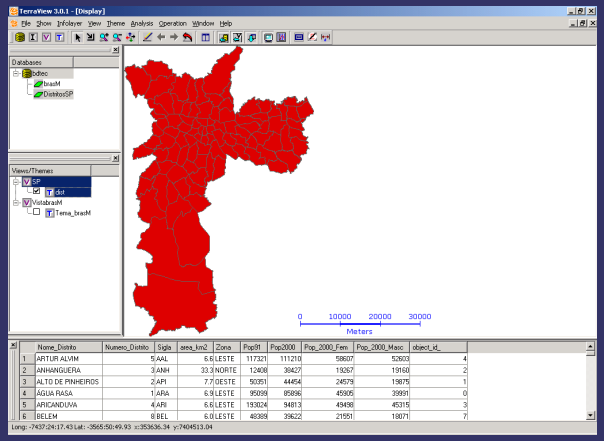
TerraLib Project

- Free software
- http://www.terralib.org
- Developed by

TerraLib

- Adds spatial/temporal capabilities to the DBMS
- Enables the construction of customized GIS





TerraLib

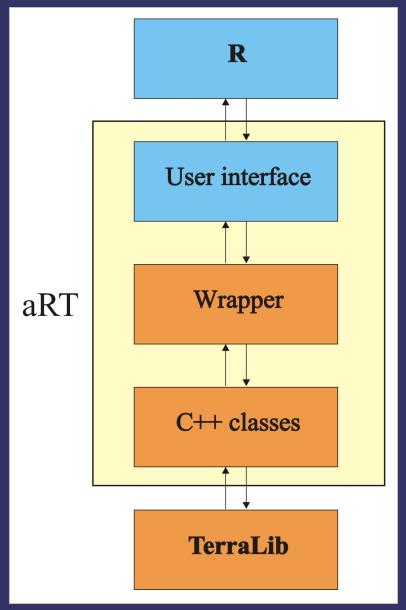
- Object oriented (C++), adheres to STL (Standard Template Library), Generic programming, etc.
- Multiplataform (Linux and Windows)
- Integrated architecture (DBMS to store, manipulate and manage geographic data)

  data and geometry in the DBMS (transparent)
  - MySQL, PostgreSQL, PostGIS
  - Oracle, Oracle Spatial, SQLServer, Access

aRT: R-TerraLib API

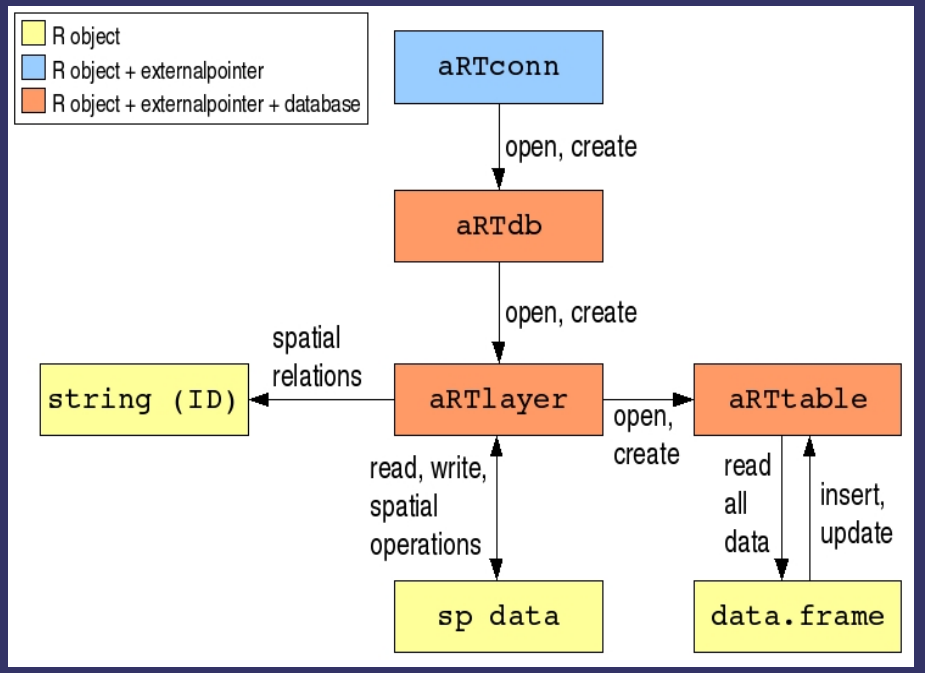
- current version: 1.0-0
- multiplataform
- developed in Linux, cross-compiled
- adheres to spatial classes defined in "sp"
- http://www.est.ufpr.br/aRT
- functionality: vignettes and scripts

aRT: R-TerraLib API

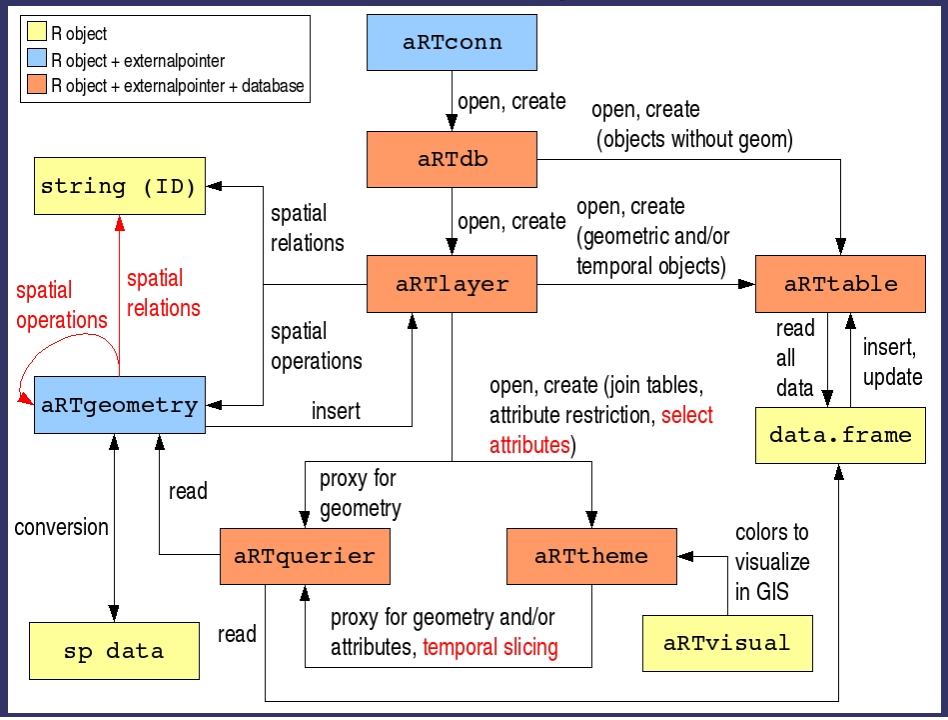


Blue blocks are R code, and the others are written in C++

aRT structure: simplified model



aRT structure: complete model



Features

- Each "player" working in her/his environment
- DBMS as the "meeting point"
- Results of analysis stored (delivered) through the DBMS
  - associated with geometries
  - as external "medias"

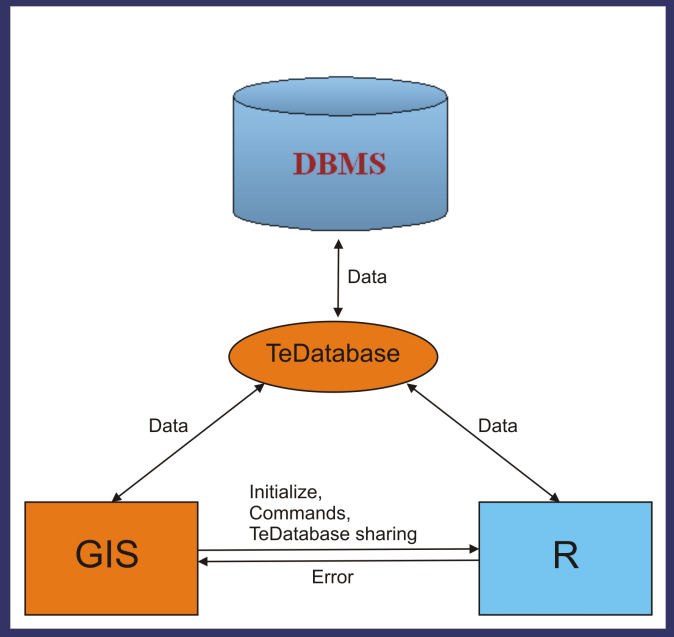
Problems...

- Polygons with holes (still) do not work
- Some repentinuous crashes when working with grids (even more frequently under Windows)
- Postgres/PostGIS compilation problems ...

  currently only MySQL working nice and round

```
con = openConn(dbms = "postgres")
```


Future Work – "TerraView" Plug-in



Future Work

- improvements in docs, vignettes, etc
- support to another DBMS's
- option for compilation/usage without DBMS
- options for memory efficient data retrieval
- further support for spatial temporal operations
- ...
- All that ... ... "red text"
- and ... embedding R in a GIS software ...

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http://www.est.ufpr.br/aRT

http://saudavel.dpi.inpe.br