The ArcView/XGobi/XploRe Environment: Spatial Data Analysis in a Linked Software Environment

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Current ArcView/XGobi/XploRe:
Collaborators

- Nicholas Lewin-Koh, Di Cook: Iowa State University, Ames, IA
- Fabian Noetzel: Humboldt University, Berlin, Germany
- Mike Mungiole, National Center for Health Statistics, Hyattsville, MD
ArcView/XGobi/XploRe: Main Idea

- Link three kinds of software packages:
  - ArcView: Geographic Information System (GIS)
  - XGobi: dynamic statistical graphics program
  - XploRe: statistical computing environment

- Available for UNIX platforms

- Interactive (dynamic) environment

- Close coupling through RPC’s
Support of Main GIS Themes

- Point themes
- Polygon themes
- Linear themes
Features of ArcView/XGobi Part

- Multivariate Link
- CDF Link
- Variogram-cloud Link
- Spatially Lagged Scatterplot Link
- Multivariate Variogram-Cloud Link
Multivariate Link

XGobi

ArcView
Variogram-Cloud Link

XGobi

ArcView
Spatially Lagged Scatterplot Link

XGobi
Multivariate Variogram-Cloud Link

XGobi
Features of XGobi/XploRe Part

- Exchange of data and commands
- External smoother
- Dynamic linked brushing

XGobi Menus

- Clone XGobi
- Smooth ...
- Subset Data ...
- Jitter ...
- Parallel Coord Plot ...
- Variable List ...
- Case List ...

- Start XploRe ...
- Stop XploRe ...
- Launch Missing Data XGobi ...
- Impute Missing Values ...

Read ...
- Save (extend current file set) ...
- Save (create new file set) ...
- Print ...
- XploRe (pass variables) ...
- XploRe (pass projection) ...
- Quit (Q)

XploRe Menus

- Mean
- Median
- Nadaraya–Watson
- Spline
- LINEAR
- SYMMETRIZED KNN
- KNN
- LOWESS
- LOCAL POLYNOMIAL
- NEURAL NETWORK
- ISOTONIC
Dynamic Linked Brushing

XploRe

XGobi
Features of ArcView/XploRe Part

- Capabilities for spatial data analysis
- Weighted head-banging algorithm for the smoothing of maps
Spatial Data Analysis in XploRe

Mean and Median Summaries

Variogram
Example: NCHS Mortality Data

- Data for 798 health service areas (HSA’s) in the contiguous US

- Variables:
  - Proportion of the hispanic population
  - Per capita income
  - Proportion of female heads of households
  - Proportion of unemployed
  - Cancer Mortality Rate (in deaths per 100,000)
Initial Choropleth Map of Cancer Mortality

ArcView
After Brushing in XGobi

XGobi

ArcView
Further Data Exploration

XGobi

ArcView
Other Applications

- Forest health data
- Precipitation data
- Remote sensing data
Current Research

- Continuation ArcView <-> XploRe part
- Spatial statistics in XploRe
- Development of a PC version of XGobi
**Additional Information**

- **Articles on ArcView/XGobi/XploRe**
  - [http://www.math.usu.edu/~symanzik](http://www.math.usu.edu/~symanzik)

- **Main Web page**
  - [http://www.public.iastate.edu/~arcview-xgobi/homepage.html](http://www.public.iastate.edu/~arcview-xgobi/homepage.html)

- **Mailing list**