

Model And Model Space

• Models may be fit from a variety of different classes

- e.g. lm, gam, rpart
- and to variations of the original dataset

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Introduction Managing Models Summary

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- Models may be fit from a variety of different classes
 - e.g. lm, gam, rpart
- and to variations of the original dataset
 - the (unmodified) dataset
 - subsets of the data
 - versions using transformed variables
 - datasets from sampling (e.g. bootstrapping)

• Models may be fit from a variety of different classes

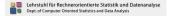
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• model statistics (for model selection/comparison)

- global statistics for comparing overall fit
- measures of variable importance
- residuals for comparing local fit

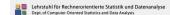
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Models yield much useful data for further analysis and you need a tool to organise that flood of data

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Introduction Managing Models Summary

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Model Analysis

Model Analysis

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R. Seger, A. Unwin	Managing Large Sets Of Models	R. Seger, A. Unwin	Managing Large Sets Of Models
Introduction Managing Models Summary		Introduction Managing Models Summary	Software Requirements Model Repository Model Comparison
Model Analysis		Outline	

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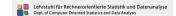
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2 Managing Models

- Software Requirements
- Model Repository
- Model Comparison



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Technical Requirements

store model forms and results

• commands in $R \Leftrightarrow$ series of textual input

Managing Models

Summary

- model information includes

Software Requirements

Model Repository

Model Comparison

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- commands in $R \Leftrightarrow$ series of textual input
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Technical Requirements

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Technical Requirements			Technical Requirements	

Technical Requirements

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- commands in $R \Leftrightarrow$ series of textual input
- model information includes
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Technical Requirements

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Introduction Managing Models

Summary

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Technical Requirements

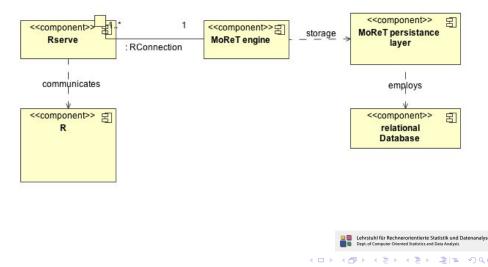
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MORET

In order to manage and compare model results a lot of data has to be stored. The software "MORET" uses a relational database for this (see next slide).

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Introduction Managing Models Summary	Software Requirements Model Repository Model Comparison	Introduction Managing Models Summary	Software Requirements Model Repository Model Comparison
Outline		Working With Moret	
 Introduction Managing Models Software Requirements Model Repository Model Comparison 		 load datasets with the MORE fit models to the data use MORET to manage the construction of export model data use the Model Explorer 	
	Lehrstuhl für Rechnerorientierte Statistik und Datenanalyse Dept of Computer Oriented Statistic and Data Analysis		Lehrstuhl für Rechnerorientierte Statistik und Datenanalyse Dept of Computer Oriented Statistics and Data Analysis
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Introduction Managing Models Summary	Software Requirements Model Repository Model Comparison	Introduction Managing Models Summary	Software Requirements Model Repository Model Comparison
Working With Moret		Working With Moret	

- load datasets with the MORET-GUI
- fit models to the data
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- load datasets with the MORET-GUI
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Managing Models Model Repository Summary Model Comparison	Managing Models Model Repository Summary Model Comparison
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 load datasets with the MORET-GUI fit models to the data use MORET to manage the database of the models. export model data use the Model Explorer 	 load datasets with the MORET-GUI fit models to the data use MORET to manage the database of the models. export model data use the Model Explorer
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MOdel REposiTory CLI <u>File Data Options</u> Welcome to MORET read.table('/Users/ralfseger/Documents/workspace/StatisticalModels/data a/election.txt',header=TRUE); All Objects removed from workspace. election.txt<-read.table('/Users/ralfseger/Documents/workspace/StatisticalModels/data/election.txt',header=TRUE); save(file="/Users/ralfseger/Documents/workspace/StatisticalModels/bina ry/data/election.txt",election.txt) file "/Users/ralfseger/Documents/workspace/StatisticalModels/data/election.txt" added to database. Caching binary data file. attach(election.txt)	 Introduction Managing Models Software Requirements Model Repository Model Comparison
dataset in workspace is 'election.txt' <	■ Lehrstuhl für Rechnerorientierte Statistik und Datenanalyse ■ Dept. of Computer Oriented Statistics and Data Analysis < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □

Introduction Software Requirements

Introduction Software Requirements

Model Selection

Model Selection

$\Theta \cap \Theta$ Select Models Model Types Dataset All LM GLM election.txt GAM RPART ok cancel

Pre	es	elect Models
•		Models space is huge.
		Work with selected subsets of all
		models.

Options Data							
file	Target Va.	Type	User Name	R Command	Residual Error	ď	J.
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forida, election.txt	b_change	LM	genericLM20060422T192	Im(b_change-income hispanic)	+4.951E-002	+6.5000+00	6
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forida, election.bd	b,change	LM	genericLM20060422T192	Im(b,change-income.v,change)	+4.7112-002	+6.5000+00	1.5
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forida_election.txt	buchange	LM	genericLM20060422T192	In(b,change-income+size)	+4.301E-002	+6.400E+00	12
Forida, election.bd.	b,change	LM	genericLM20060422T192	Im(b,change-income+x,change)	+4.3102-002	+6.4000+00	1.24
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forida, election.txt	b,change	LM	genericLM20060422T192	Imb_change+income+hispanic v_changel	+4.290E-002	+6.4000+00	12
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forida, election.txt	b_change	LM	genericLM20060422T192	Im(b_change+income hispanic+income	+4.511E-002	+6.4000+00	1.5
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forida, election.bd.	b,change	LM	genericLM20060422T192	Im(b, change+income :hispanic+hispanic.	+4.5032-002	+6.4000+00	1.55
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forida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change+income:size+hispanic.v_c	+4.7935-002	+6.4000+00	1.51
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Forida, election, bd.	buchange	LM	genericLM20060422T192	Intb.change-income.v.change+hispani.	+4.6851-002	+6.4002+00	1.63
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Preselect Models

- Models space is huge.
- Work with selected subsets of all models.

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R. Seger, A. Unwin	Managing Large Sets Of Models	R. Seger, A. Unwin	Managing Large Sets Of Models
Introduction Managing Models Summary	Software Requirements Model Repository Model Comparison	Introduction Managing Models Summary	Software Requirements Model Repository Model Comparison

Model Overview

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File	Target Va	Туре	▼ User Name	R Command	Residual Error	df	#
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florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income)	+4.542E-002	+6.500E+001	2
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income:hispanic)	+4.951E-002	+6.500E+001	6
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income:size)	+4.804E-002	+6.500E+001	7
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income:v_change)	+4.711E-002	+6.500E+001	8
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income+hispanic)	+4.207E-002	+6.400E+001	22
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income+size)	+4.301E-002	+6.400E+001	23
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income+v_change)	+4.310E-002	+6.400E+001	24
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income+income:hispanic)	+4.195E-002	+6.400E+001	25
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income+income:size)	+4.346E-002	+6.400E+001	26
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income+income:v_change)	+4.354E-002	+6.400E+001	27
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income+hispanic:size)	+4.294E-002	+6.400E+001	28
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income+hispanic:v_change)	+4.290E-002	+6.400E+001	29
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income+size:v_change)	+4.403E-002	+6.400E+001	30
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income:hispanic+income:	+4.626E-002	+6.400E+001	52
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income:hispanic+income:	+4.511E-002	+6.400E+001	53
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income:hispanic+hispanic	+4.935E-002	+6.400E+001	54
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income:hispanic+hispanic	+4.903E-002	+6.400E+001	55
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income:hispanic+size:v_c	+4.838E-002	+6.400E+001	56
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income:size+income:v_ch	+4.710E-002	+6.400E+001	57
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income:size+hispanic:size)	+4.801E-002	+6.400E+001	58
florida_election.txt	b_change	LM	genericLM20060422T192	lm(b_change~income:size+hispanic:v_c	+4.799E-002	+6.400E+001	59
florida_election.txt	b_change	LM	genericLM20060422T192	Im(b_change~income:size+size:v_chan	+4.473E-002	+6.400E+001	6(
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florida election.txt	b change	LM	genericLM20060422T192	Im(b change~income:v change+hispani	+4.694E-002	+6.400E+001	62 *

Model Overview Options

Model Values Script	
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▶ 📁 Datafile	
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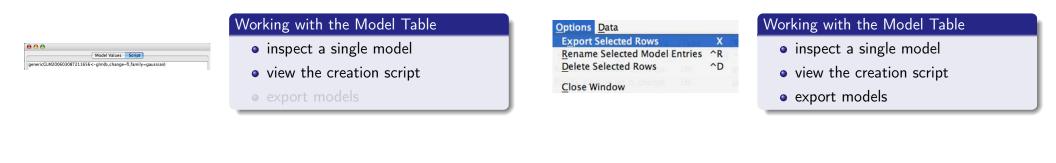
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Model Overview Options

Model Overview Options



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	R. Seger, A. Unwin Introduction Managing Models Summary	Managing Large Sets Of Models Software Requirements Model Repository Model Comparison	R. Seger, A. Unwin Introduction Managing Models Summary	Managing Large Sets Of Models Software Requirements Model Repository Model Comparison
Model Explorer			Model Explorer	

Model Explorer

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- dynamically select attributes of the stored models
- use predifined profiles

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Actions

- dynamically select attributes of the stored models
- use predifined profiles (e.g. for all coefficient values)

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Using External Applications

Using External Applications

External Interfaces

- export models to XML or CSV
- copy and paste to a spreadsheet

External Interfaces

- ${\ensuremath{\, \bullet }}$ export models to XML or CSV
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External Interfaces • export models to XML or CSV • copy and paste to a spreadsheet 000 Ohne Titel (TK) Image: Image A1 A B C UserName (Intercept) fl oh oountyA generic6LM200 -3.51873988410.0370566415445048 ountyA ountyA generic6LM2000 0.0370214541456593 -0.0370566415445048 ountyA county Alachua ounty Allen eric6LM200 -4.792809486391E-4 0.0147326588 -0.005589544 -0.013851523 -0.008180469 -0.063716977(0.0298029184 0.0796021819 0.0454324483 0.0293666720 ener icGLM200 0.0095431208610535 ener icGLM200 -3.518739884 0.0370566415445048 ener ic6LM200 -4.792809486 0.0513064290086428 ener ic6LM200 -3.518739884 0.0095783082598991 -0.036573770 -0.005589544 -0.013851523 -0.008180469 -0.063716977 0.0298029184 0.0282957529 -0.005873980 0.0293666720 0.051306429-0.036573770-0.005589544-0.013851523-0.008180469-0.063716977(0.0298029184)0.0282957529-0.0058 ic6LM2000.050827148060004 -0.095783082598991 0.0147826588 -0.005599544 -0.013851523 -0.006160469 -0.06571697710.0296029184 0.0796021819 0.0454824488 0.0295665720 icGLM200 0.0095431208610535 ioGLM200-4.792809486389Eic6LM200-4.792809486(0.0513064290086428 -0.036573770 -0.005589544 -0.013851523 -0.008180469 -0.0637169770 0.0298029184 0.0282957529 -0.005873980 0.029366672 icGLM200 -3 51873988410.0095783082598991 icGLM200 -4 792809486 0.0634346604347228 -0.0487020011-0.0055895441-0.0138515231-0.0081804691-0.06371697710.029802918410.01616752141-0.01800221210.0293666720 -0.063434660 298029184 0.0161675214 -0.018002212 0.029366672 298029184 0.0161675214 -0.018002212 0.029366672 ic6LM200-4.79280948610.0634346604347221 0.013851523 -0.008180469 -0.0637169 Lehrstuhl für Rechnerorientierte Statistik und Datenanalyse

- Managing large sets of models is possible using MORET
- MORET can be used as link to other applications for further analysis
- Further developments
 - Integration of more model alternatives
 - Better control of transformed variables

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Managing Models Summary

Additional Sources I

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