

# Thoughts on Human-Computer Interaction

Gerald Weber  
Guest Lecture  
Advanced HCI 702/705  
22 March 2012

# Why do we interact with computers?



incl. VAT)

Call mobiles or landlines, anywhere in the world with Skype.

[Buy credit](#)

or

[Get a subscription](#)

\* A small [connection fee](#) applies.

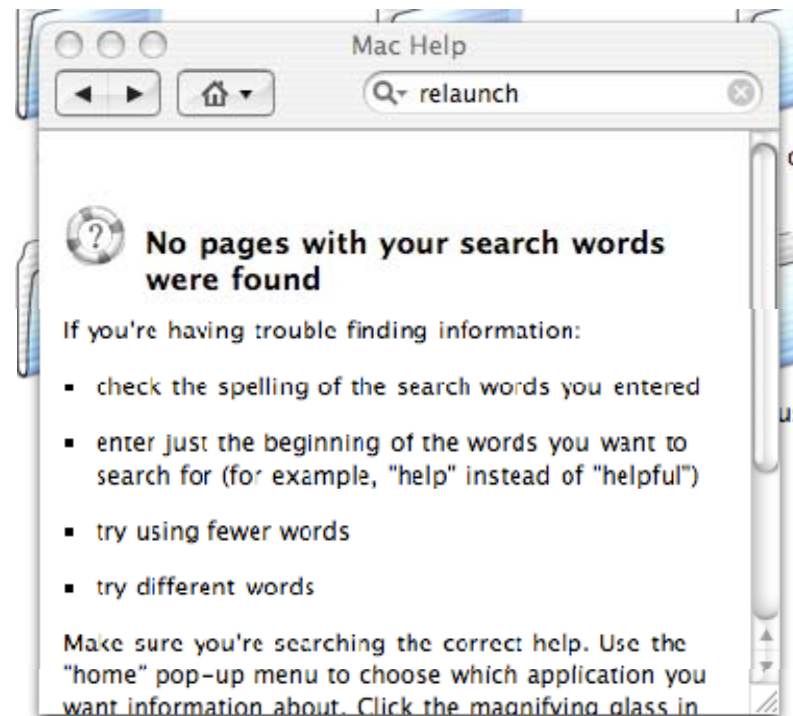


### No emergency calls with Skype

Skype is not a replacement for your telephone and can't be used for emergency calling.

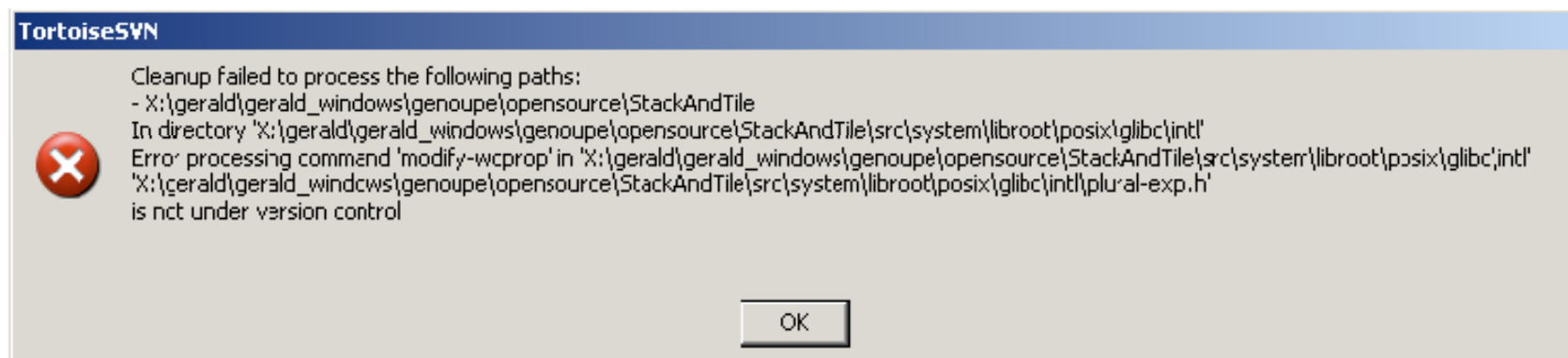
# No Search

- Menu options are not guaranteed to appear in help or search.



# Modality in the wider sense

- Text in GUIs != Text in Documents
- No copy/paste of GUI text



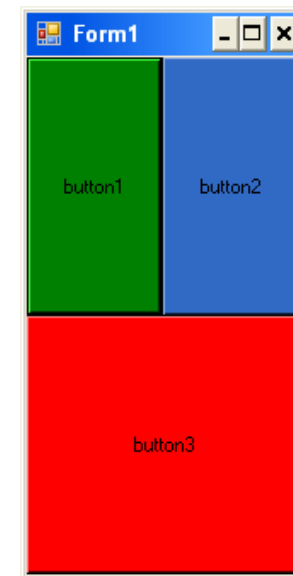
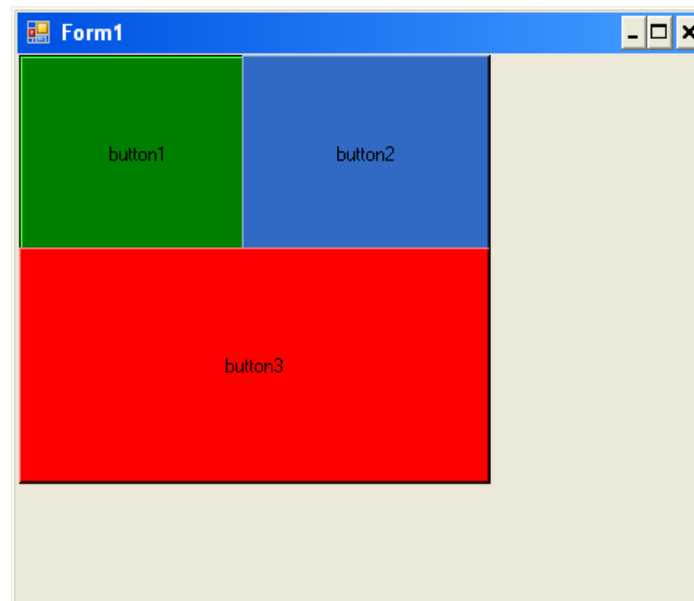
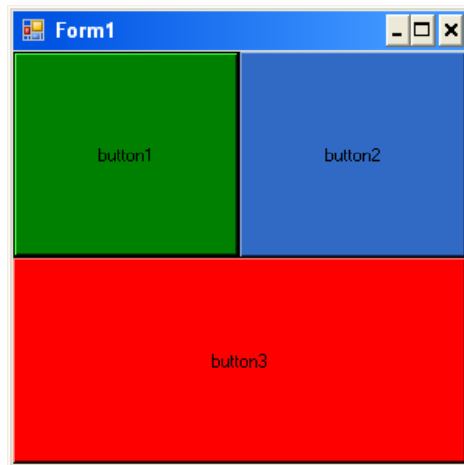
**Module: COMPSCI 351/S1/C Fundamentals of Database Systems**

[Week Dates](#) Weeks: 10-23 (28 Feb 2011-5 Jun 2011)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
8:00		COMPSCI 351+SOFTENG					
8:30		351/S1/C/120/LAB/01					
9:00		<a href="#">303S-175</a>			COMPSCI 351+SOFTENG		
9:30		10-15, 18-23			351/S1/C/120/LAB/02		
10:00					<a href="#">303S-G75</a>		
10:30					10-15, 18-23		
11:00					COMPSCI 351+SOFTENG		
11:30					351/S1/C/60/LEC03/01		
12:00					Gerald Weber,		
12:30					Gill Dobbie		
13:00					10-15, 18-23		
13:30		COMPSCI 351+SOFTENG					
14:00		351/S1/C/60/LEC01/01					
14:30		Gill Dobbie,					
15:00		Gerald Weber					
15:30		10-15, 18-23					
16:00		<a href="#">LibB10/109-B10</a>					
16:30					COMPSCI 351+SOFTENG		
17:00					351/S1/C/60/LEC02/01		
17:30					Gill Dobbie,		
					Gerald Weber		
					10-15, 18-23		
					<a href="#">LibB10/109-B10</a>		
15:00	COMPSCI 351+SOFTENG						
15:30	351/S1/C/120/LAB/04						
16:00	<a href="#">303S-G75</a>						
16:30	10-15, 18-23	COMPSCI 351+SOFTENG					
17:00		351/S1/C/120/LAB/03					
17:30		<a href="#">303S-G75</a>					
		10-15, 18-23					

# Layout Managers

- Get a layout specification as input.
- Recalculate the positions and sizes of the controls after each resizing.



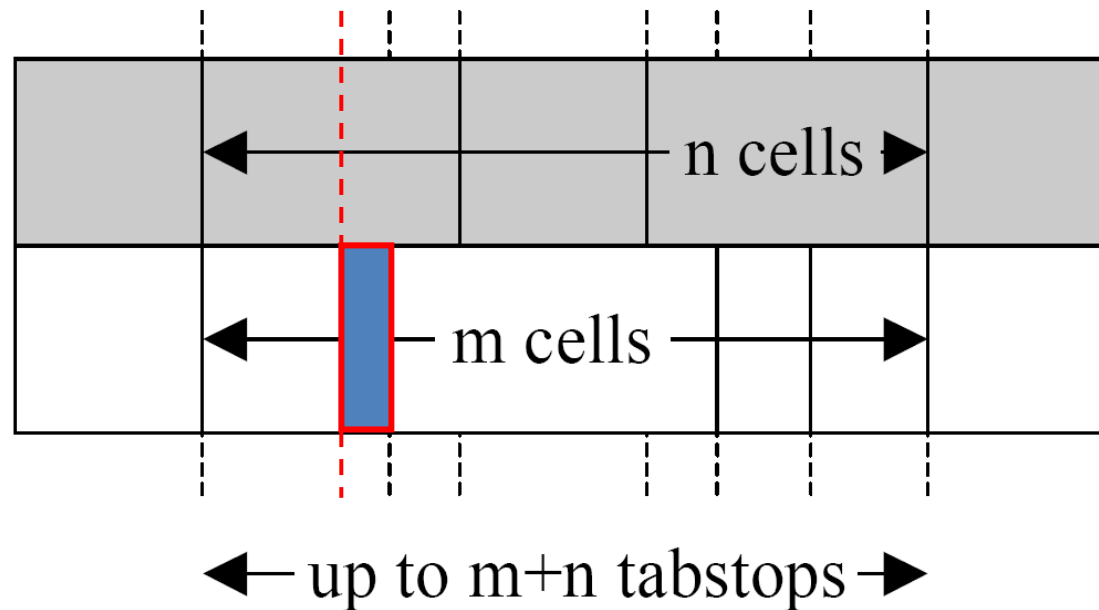


# Blocking GridBag Layout

- Consequence: Serrated Border.
- Common to popular HTML rendering engines:
- Gecko (Firefox)
- WebKit (Safari)
- Trident (IE)

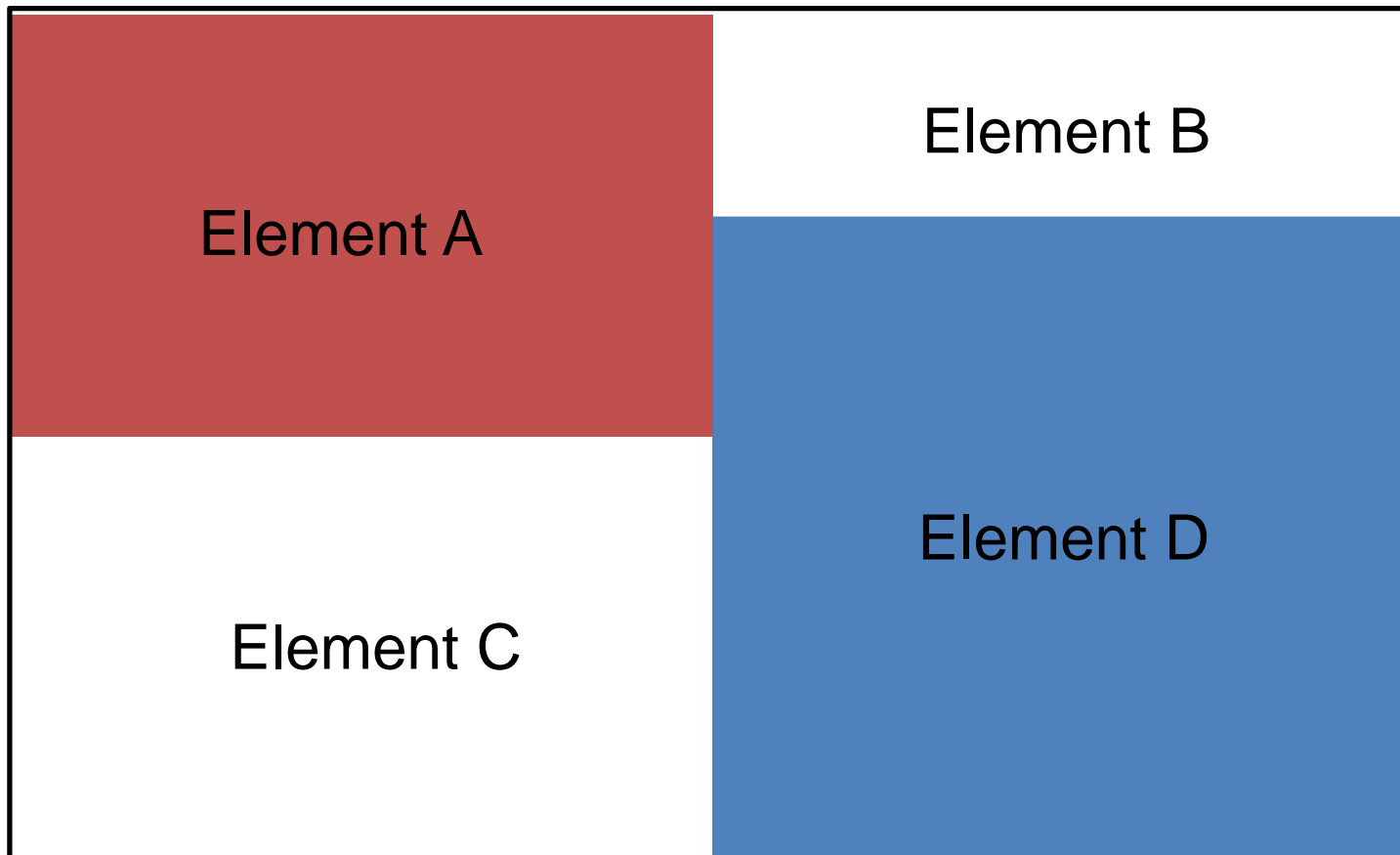
Cynthia	credit card: Visa	card nr: ..... 4321	tel: + 65 (3)
td.	account nr: 37473	payment mode (all invoices): monthly	tel: + 64 (5)
.W.	credit card: Master	card nr: ..... 5678	tel: + 62 (3)
M.	credit card: Diners Club	card nr: ..... 4321	tel: + 64 (9)
inc.	account nr: 654321 000	payment mode (all invoices): weekly	tel: + 61 (3)

# General Case

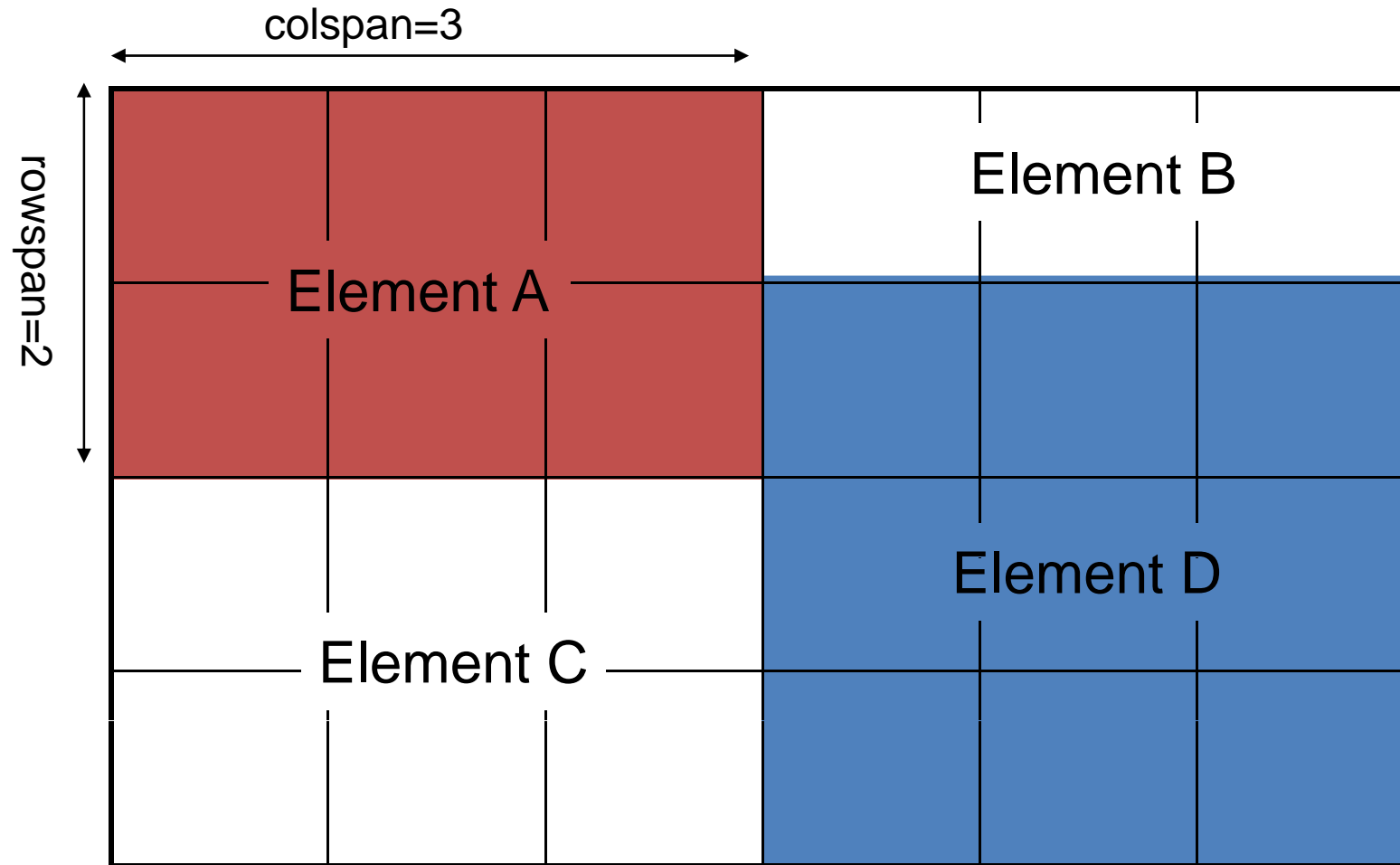


This is a case of bad coupling between the two different column types.

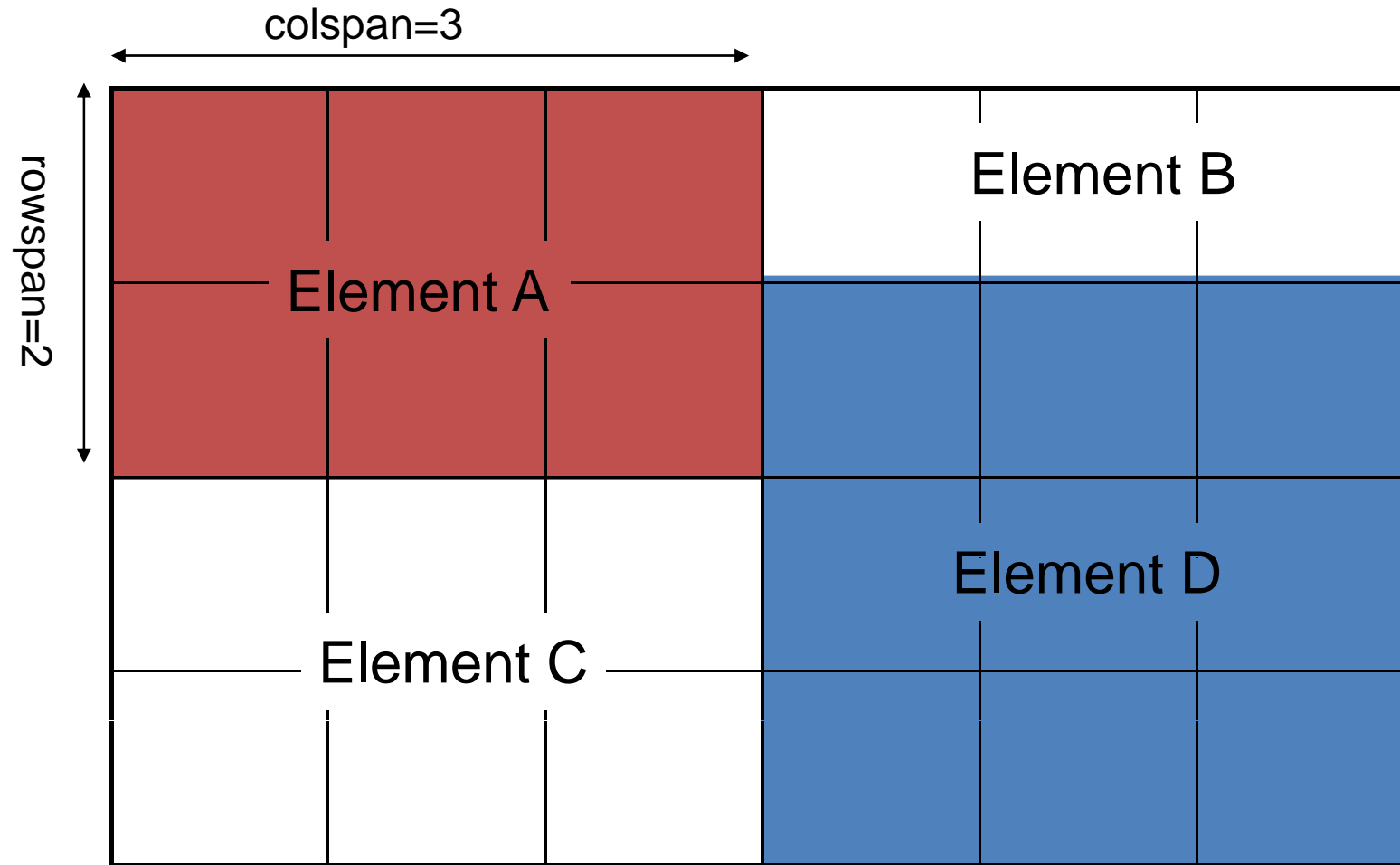
# Sample Complex Layout



# Sample GridBag Layout

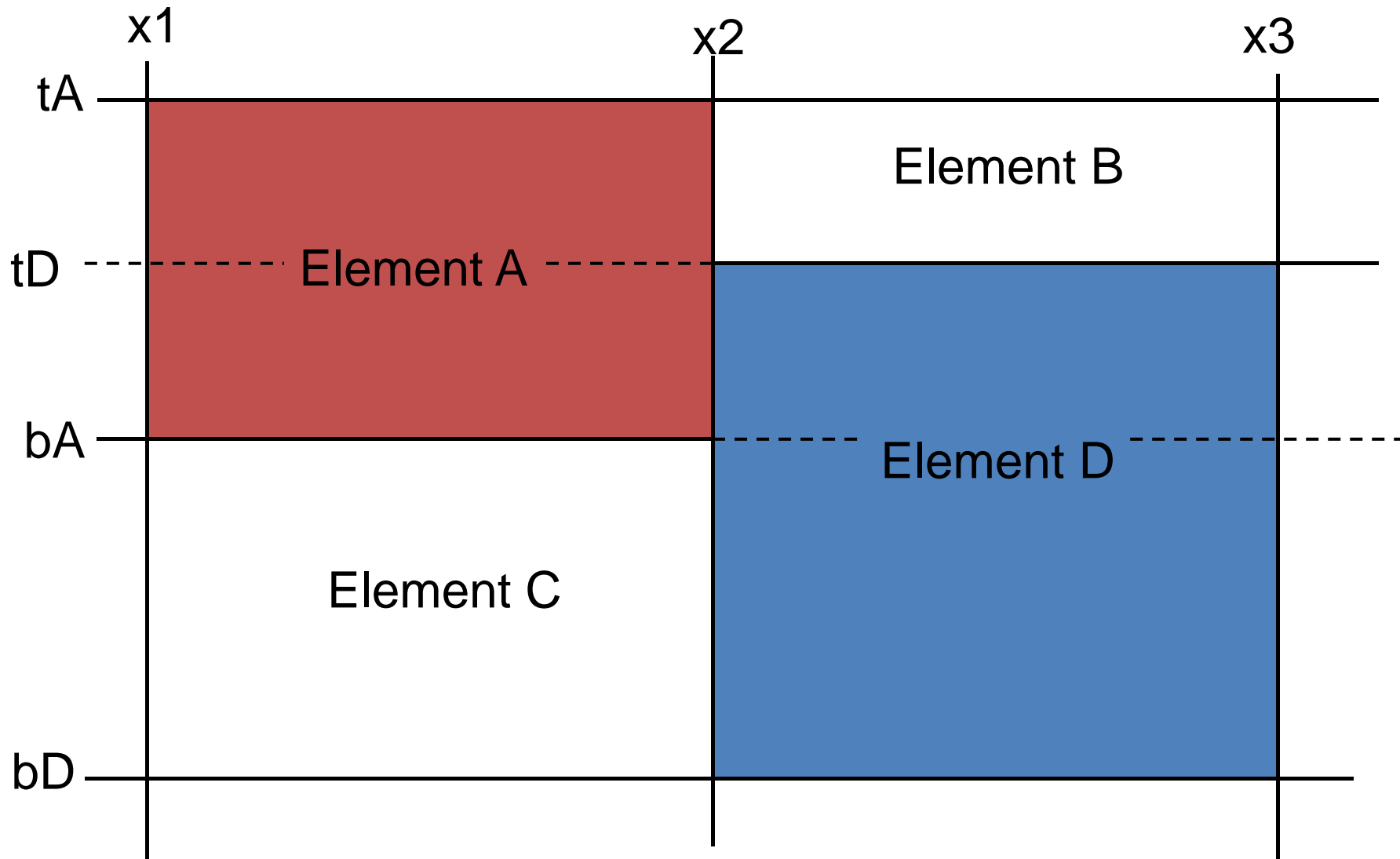


# Sample GridBag Layout



# Sample Auckland Layout

[Lutteroth, Weber, User interface layout with ordinal and linear constraints, AUIC 2006]



# ALM solution

customer nr: 1234	name: Agnew, C	credit card: Visa	card nr: 4321 4321 4321 4321	tel: + 65 (3) 210987
customer nr: 9876	name: Examp Ltd.	account nr: 37473	payment mode: monthly	tel: + 64 (5) 8765433
customer nr: 6789	name: Peach, G. W	credit card: Master	card nr: 9876 5432 1234 5678	tel: + 62 (3) 3456789
customer nr: 7654	name: Plum, I. M.	credit card: Diners Club	card nr: 2468 1357 9876 4321	tel: + 64 (9) 9876
customer nr: 8888	name: Samp-L Inc.	account nr: 6543210	payment mode: weekly	tel: + 61 (3) 4556778

?

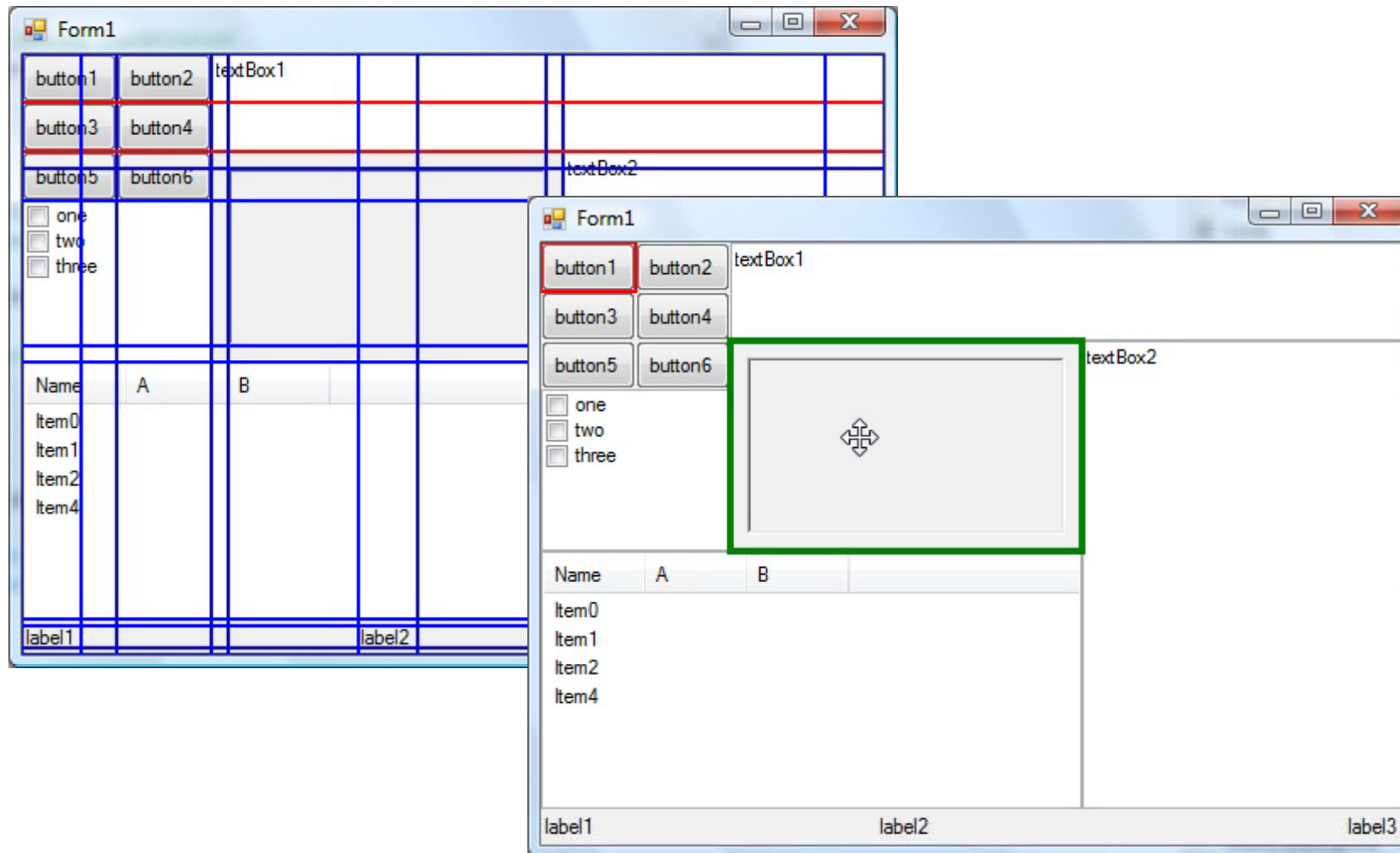
- ALM = Auckland Layout Model
- In ALM, only filled areas incur necessary constraints.
- Tabstops may have only partial order.
- Auckland Layout avoids Running Number Coupling:



Jean-François Millet, *the Gleaners*, 1857

Gerald Weber, Guest Lecture 702/705

# On-line Editing of GUIs



# Document Orientation

- Technical basis: All components register with the layout manager.
- End-User Programming of GUIs
- User Interfaces as Documents

Auckland Layout Model  
(ALM)

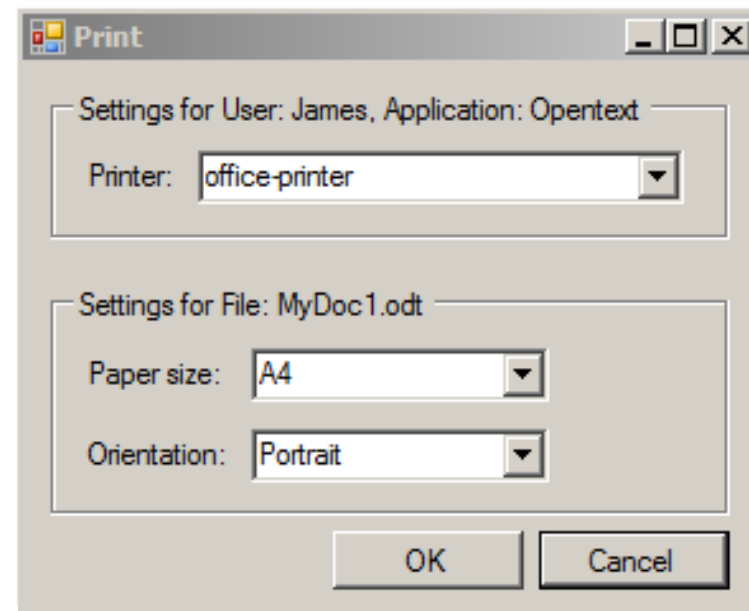
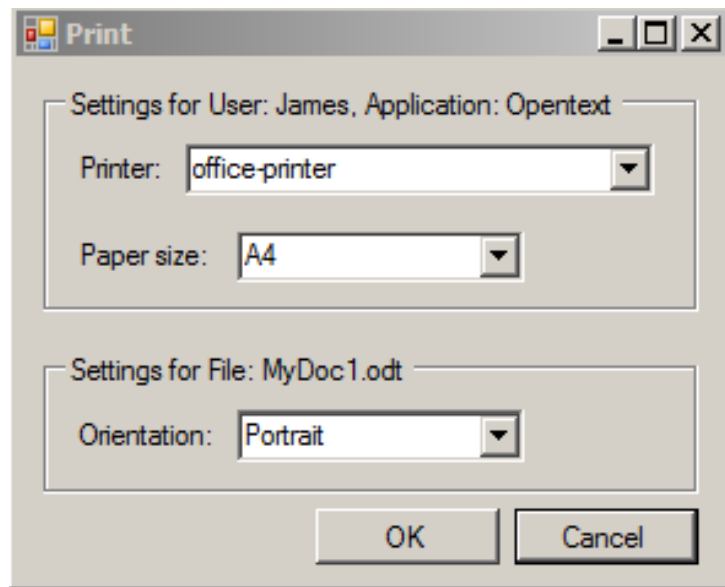


Auckland Interface Model  
(AIM)

Lung-Chen Lee, Christof Lutteroth, Gerald Weber. Improving End-User GUI Customization with Transclusion. In: Proceedings of the 33rd Australasian Computer Science Conference (ACSC 2010), 2010.

# Document Orientation

- User Interfaces as Documents
- Advanced features such as Transclusion



# Multi-Platform Support

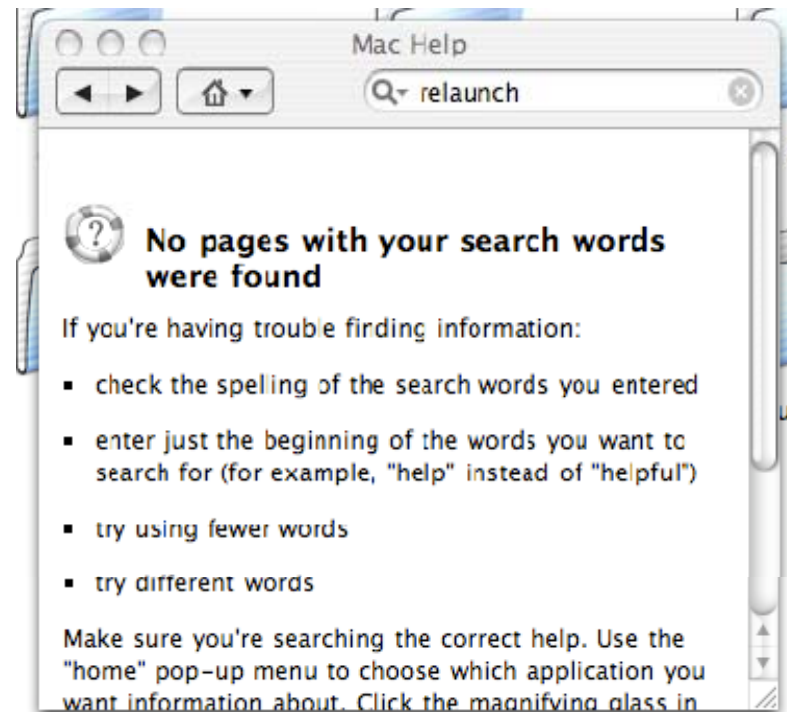
- ALM is available in:
  - Windows (C#)
  - Haiku (C++)
  - Java
  - Flash
- Open Source
- Can be ported to other platforms
- Very active development project



# Problems in Current GUIs

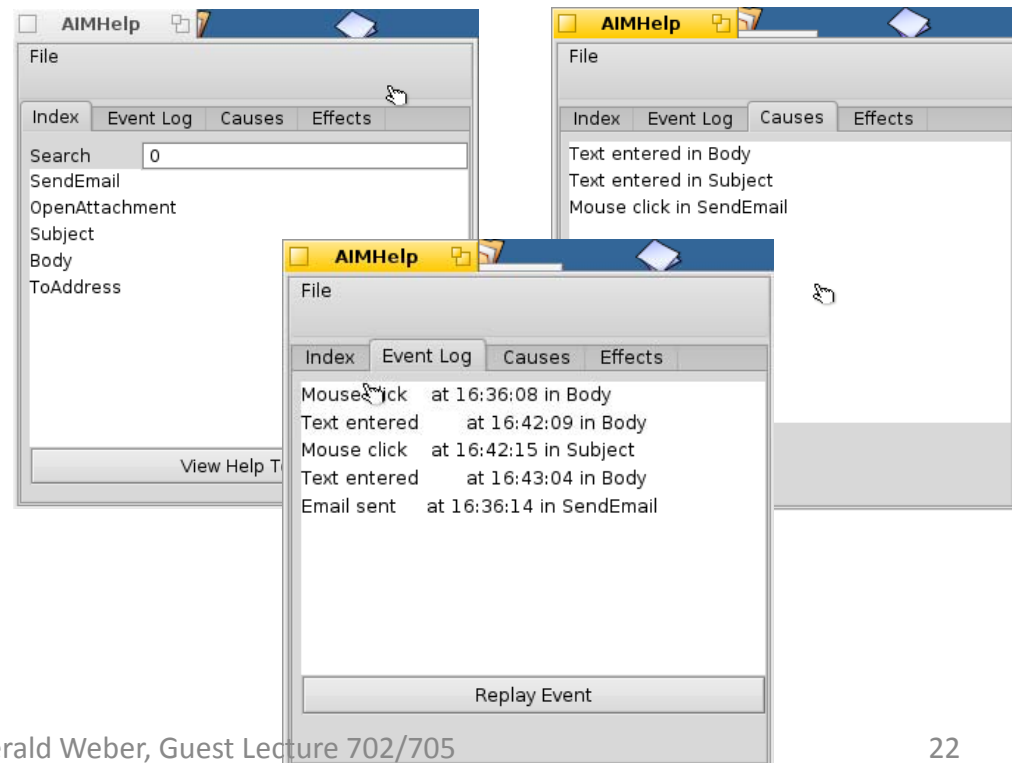
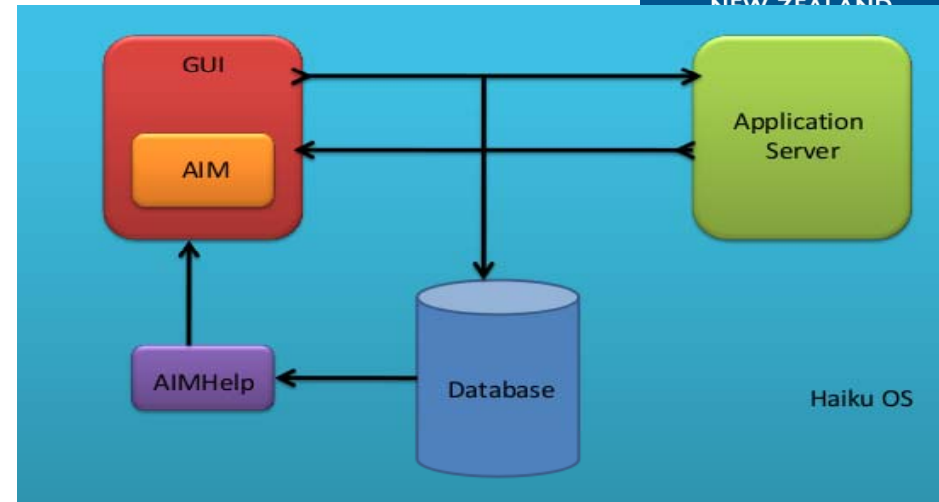
- No Help, no Search
- Menu options are not guaranteed to appear in help or search.

Yashasvi Appilla Chakravarthi,  
Christof Lutteroth, Gerald Weber.  
AIMHelp: Generating Help for GUI  
Applications Automatically.  
(CHINZ 2009), ACM Press, 2009.



# HaikuHelp

- Generate help information automatically by analyzing input messages and state changes in a GUI
- Features:
  - Automated Help Index
  - Event Log
  - Causes Analysis
  - Effects Analysis



# Mashups with Tuplespaces

Sheng, Lutteroth, Weber, OZCHI 2011

## Mashup Example:

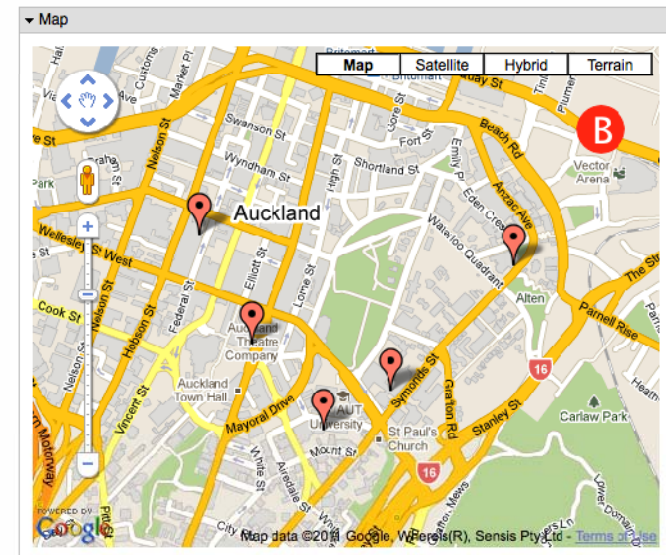
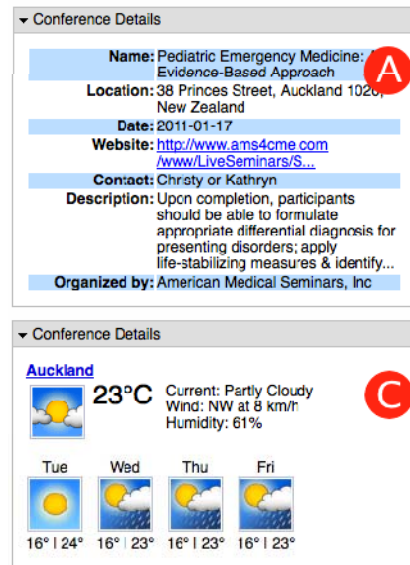
(A) *Conference detail widget* contains info about the conference

(B) *Hotel search widget* receives conference address from (A) and shows all hotels nearby on the map

(C) *Weather forecast widget* receives conference address and date from (A) and shows the weather forecast

## Aims

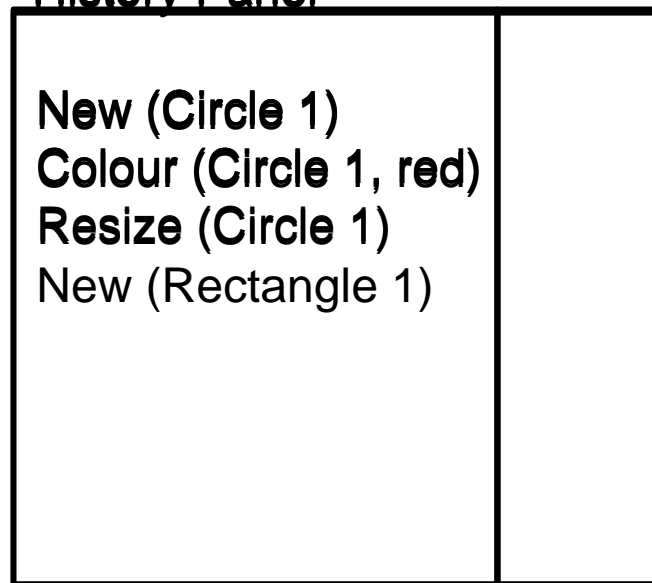
1. Flexible communication patterns:
2. Automatic wiring (“plug and play”):



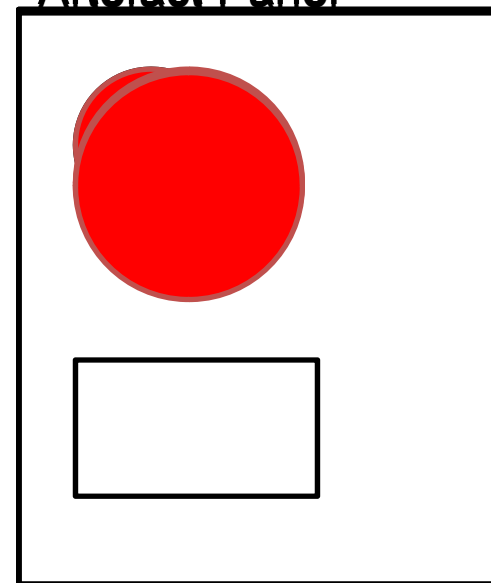
# Writing History

- Editors record the *history* of *user operation applications* (called *operations* for short)
- **Operation:** An action of the user, e.g. creating a new shape
- **History:** A list of operations

History Panel



Artefact Panel



# History Operations: Generalizing and Specializing

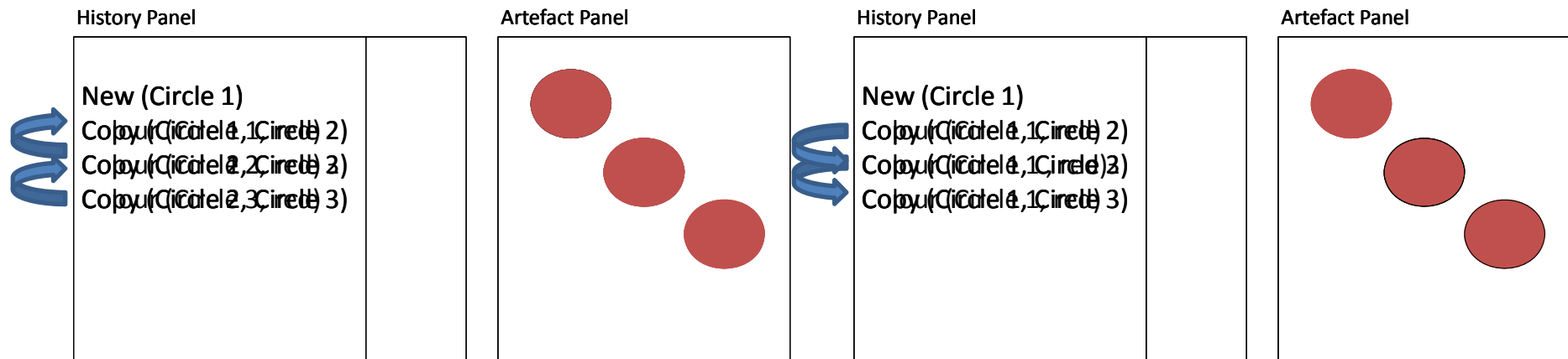
25

## Generalising

Apply an operation to a  
superset of shapes

## Specialising

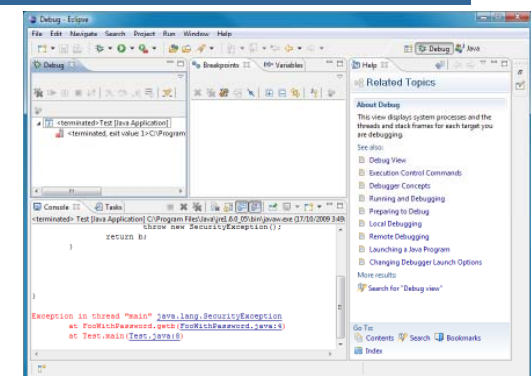
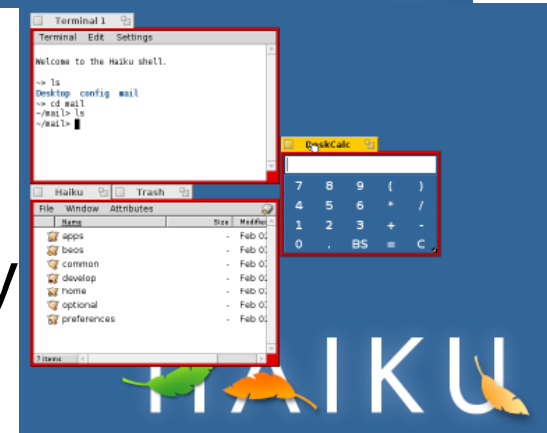
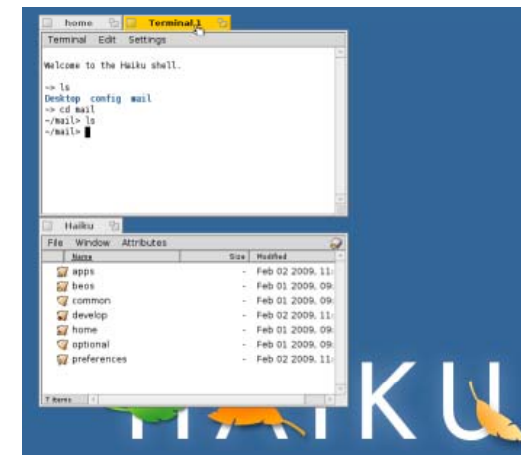
Apply an operation to a  
subset of shapes



BUENO, C., CROSSLAND, S., LUTTEROTH, C., WEBER, G.:  
Rewriting History: More Power to Creative People, OZCHI, Canberra, 2012.

# Stack & Tile

- New feature for a windowing system (in Haiku OS)
- Hold Windows key down to Stack&Tile windows
  - Stack window onto another by overlapping their tabs
  - Tile window to other windows by bringing edges close together
- Stack&Tile configuration is persistent (if supported by app)



Many thanks for your  
attention

Questions?