



# QuickSpace New Window Operations for the Desktop Metaphor

Dugald Hutchings & John Stasko

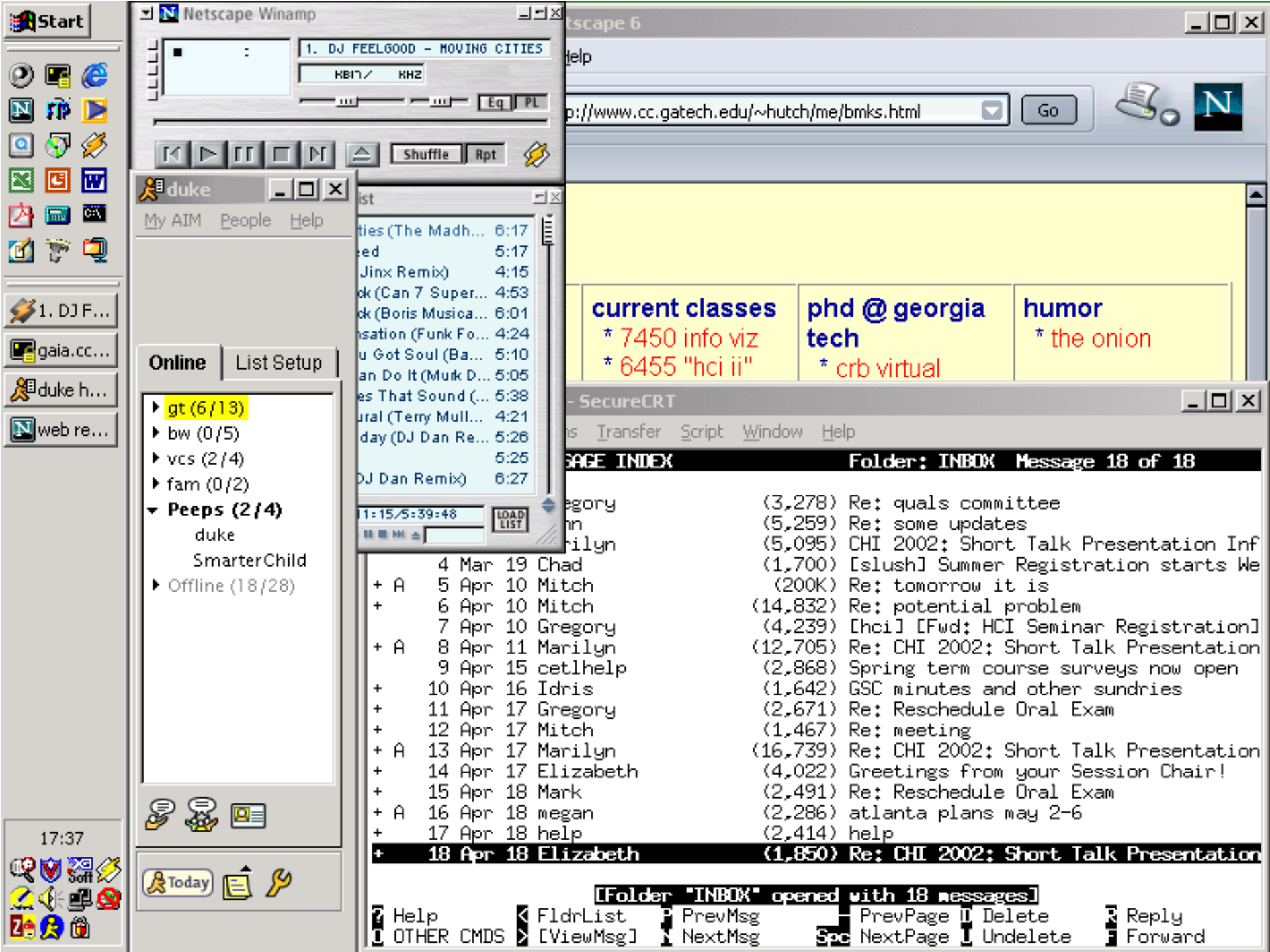


[www.gvu.gatech.edu / ii / space](http://www.gvu.gatech.edu/ii/space)



- ❏ **fundamental windowing operations**
  - ❏ **open, close**
  - ❏ **move, resize**
    - ❏ **minimize, maximize**
  
- ❏ **some find these too weak to effectively handle many windows or tasks**





duke

My AIM People Help

Online List Setup

- gt (6/13)
- bw (0/5)
- vcs (2/4)
- fam (0/2)
- Peeps (2/4)
  - duke
  - SmarterChild
- Offline (18/28)

list

- ties(The Madh... 6:17
- ed 5:17
- Jinx Remix) 4:15
- ck(Can 7 Super... 4:53
- ck(Boris Musica... 6:01
- nsation(Funk Fo... 4:24
- u Got Soul(Ba... 5:10
- an Do It(Murk D... 5:05
- es That Sound(... 5:38
- ural(Terry Mull... 4:21
- day(DJ Dan Re... 5:26
- 5:25
- DJ Dan Remix) 6:27

1:15/5:39:48

LOAD LIST

current classes * 7450 info viz * 6455 "hci ii"	phd @ georgia tech * crb virtual	humor * the onion
---	--	----------------------

SecureCRT

is Transfer Script Window Help

PAGE INDEX Folder: INBOX Message 18 of 18

Category	Size	Subject
	(3,278)	Re: quals committee
	(5,259)	Re: some updates
	(5,095)	CHI 2002: Short Talk Presentation Inf
	(1,700)	[slash] Summer Registration starts We
	(200K)	Re: tomorrow it is
	(14,832)	Re: potential problem
	(4,239)	[hci] [Fwd: HCI Seminar Registration]
	(12,705)	Re: CHI 2002: Short Talk Presentation
	(2,868)	Spring term course surveys now open
	(1,642)	GSC minutes and other sundries
	(2,671)	Re: Reschedule Oral Exam
	(1,467)	Re: meeting
	(16,739)	Re: CHI 2002: Short Talk Presentation
	(4,022)	Greetings from your Session Chair!
	(2,491)	Re: Reschedule Oral Exam
	(2,286)	atlanta plans may 2-6
	(2,414)	help
<b>+</b>	<b>18 Apr 18</b>	<b>Elizabeth (1,850) Re: CHI 2002: Short Talk Presentation</b>

[Folder "INBOX" opened with 18 messages]

Help FldrList PrevMsg PrevPage Delete Reply  
OTHER CMDS [ViewMsg] NextMsg Spc NextPage Undelete Forward

17:37

Soft

Taskbar icons: Network, Volume, Safely Remove Hardware, System Tray



- ❏ new operations to aid management
- ❏ specific focus: resizing
  - ❏ “active” window: allocate space
  - ❏ “inactive” windows: preserve information
- ❏ “be smarter than maximize”

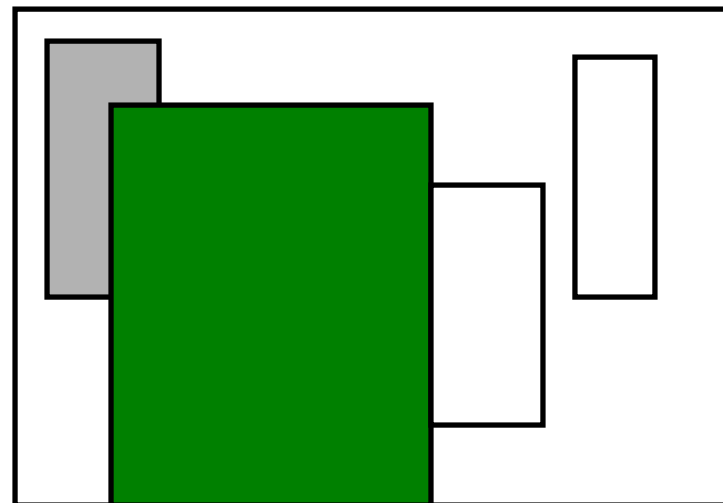
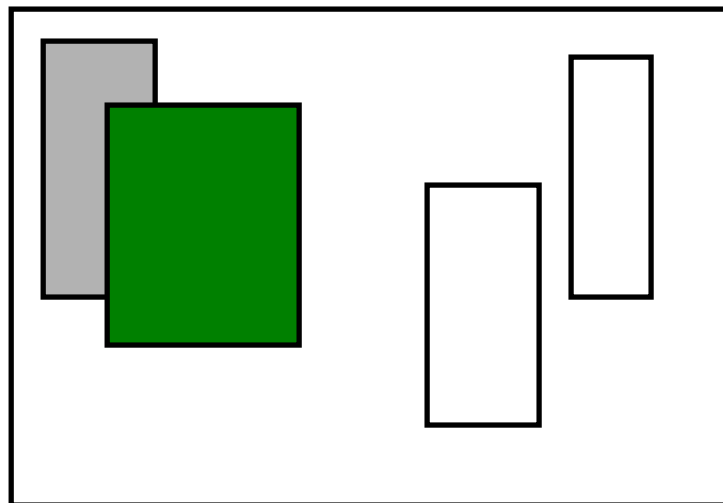




[4] Operations Overview



expand



Start



- 1. DJ F...
- gaia.cc...
- duke h...
- web re...
- emacs...
- C:\duk...
- Atlanta...
- 17:46 18

C:\duke\current-...

File Edit View F >>

Back > >>

Address  Go

Name
presentation
chi2002-registration.html
chi-short-review.txt
hotel-registration.html
hutchings-stasko-quickspace.pdf
salzmann-short-talks-email.txt
ShortTalkInfo.pdf

My A...

17...

Onli...

gt

bw

vc

fa

**Peeps (2/4)**

- duke
- SmarterChild

Offline (18/28)

emacs@MERION

Buffers Files Tools Edit Search Mule

to-do list for today

- \* finish CHI presentation
- \* meeting with John 19:00
- \* confirm hotel reservation

-- \ \*\* \*scratch\* (Lis

Atlanta, Georgia news | Atlanta Journal-Consti...

**The Atlanta Journal-Constitution**

ajc.com

[News](#) | [Metro](#) | [Sports](#) | [Busi](#)

© BELL SOUTH Yellow Pages

Thu • Apr 18

Current temp: 86

WEEKEND ENTERTAINMENT

Lotsa music | Rock



Today

Taskbar icons: Today, list, wrench

1. DJ F...  
 gaia.cc...  
 duke h...  
 web re...  
 emacs...  
 C:\duk...  
 Atlanta...  
 17:48 18

C:\duke\current-...  
 File Edit View F >>  
 Back Forward Home >>  
 Address  Go  
 Name ▲  
 presentation  
 chi2002-registration.html  
 chi-short-review.txt  
 hotel-registration.html  
 hutchings-stasko-quickspace.pdf  
 salzmann-short-talks-email.txt  
 ShortTalkInfo.pdf

Online  
 Peeps (2/4)  
 duke  
 SmarterChild  
 Offline (18/28)

emacs@MERION  
 Buffers Files Tools Edit Search Mule  
 to-do list for today  
 \* finish CHI presentation  
 \* meeting with John 19:00  
 \* confirm hotel reservation  
 --\ \*\* \*scratch\* (Lis

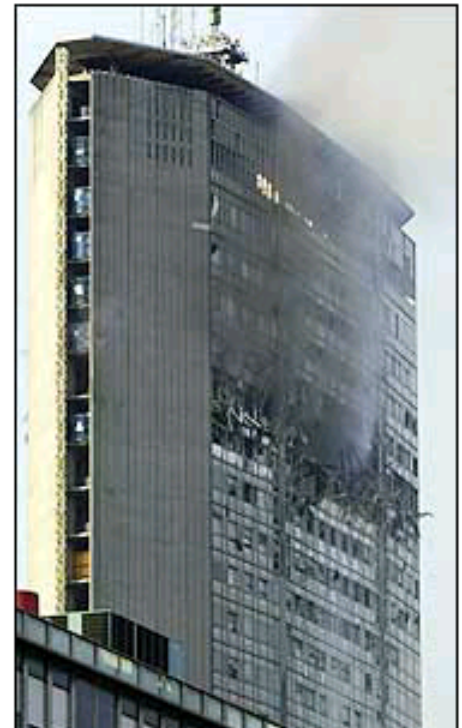
17:48  
 Today

AJCClassifieds  
 The Atlanta Journal-Constitution  
 ajc.com  
 News | Metro | Sports | Business | Living | Classifieds  
 © Bellsouth Yellow Pages Sales and Advertising

Thu • Apr 18  
 Current temp: 86  
[Weather](#)  
**Find a job**  
**Find a home**  
**Find a car**  
**Marketplace**

**News**  
**Metro**  
[The Vent](#)  
[Cop briefs](#)  
[Obituaries](#)  
**Sports**  
[Braves](#)  
[Falcons](#) | [Hawks](#)  
[UGA](#) | [Tech](#)  
[High Schools](#)  
[NASCAR](#)  
[Thrashers](#)  
**Business**  
[Delta](#) | [Coke](#)  
[CNN](#) | [Horizon](#)  
[Skyline Report](#)  
[Wage finder](#)

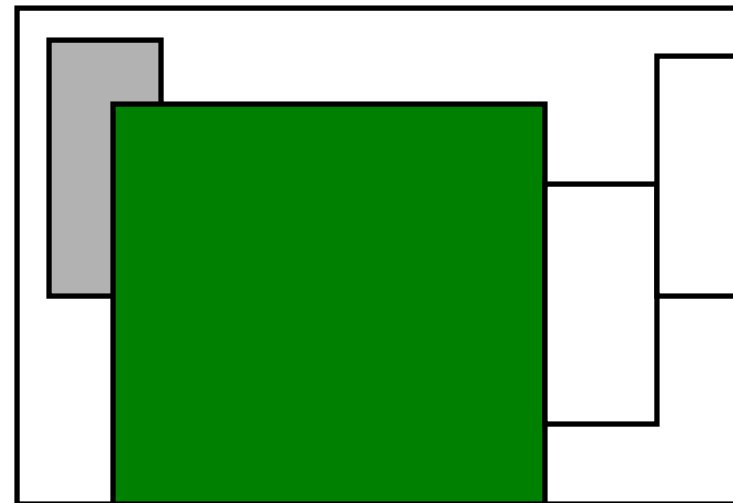
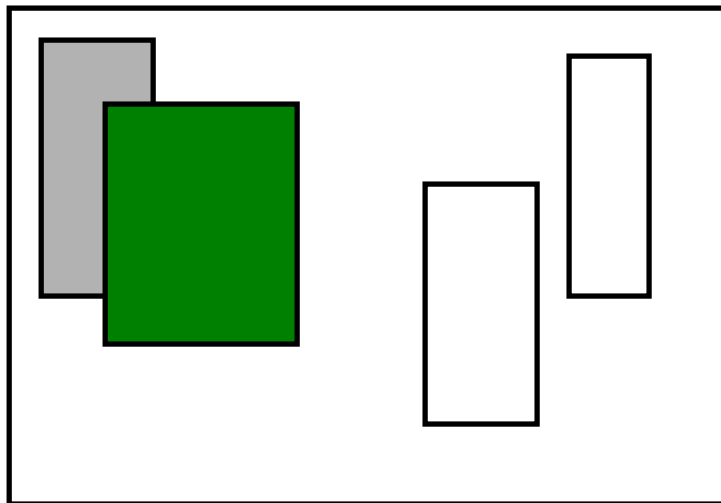
**WEEKEND ENTERTAINMENT GUIDE**  
**Lotsa music!**  
 Alan Jackson, Willie, String Cheese, more.  
[Lineups, schedule](#)  
**Rock's big role**  
 "Scorpion King" has action, but lacks bite.  
[Review](#) | [Other films](#)



**BREAKING NEWS**  
**Small plane slams skyscraper in Italy**  
 Accident suspected: Four believed dead in Milan high-rise housing local government offices.  
[Senate rejects oil drilling in refuge](#)  
 By a wide margin, Senate says no to oil development in Arctic wildlife refuge that been a centerpiece of the Bush energy agenda.  
[Wild road rage incident takes place at airport](#)  
 Motorist in custody after ramming a rental truck



# shove





Start



Atlanta, Georgia news | Atlanta Journal-Constitution - Netscape 6

**AJCClassifieds**

**ajc.com** The Atlanta Journal-Constitution

[News](#) | [Metro](#) | [Sports](#) | [Business](#) | [Living](#)

Document: Done (5...

```

emacs@MERION
Buffers  Files  Tools  Edit  Search  Mule  Help
CHI - don't forget
* slides and laptop
* demo application
* hair brush
--\ ** *scratch* (Lisp I

```

C:\duke\current-s...

File Edit View F >>

Back Forward Home >>

Address  Go

Name
presentation
chi2002-registration.html
chi-short-review.txt
hotel-registration.html
hutchings-stasko-quickspace.pdf
salzmann-short-talks-email.txt
ShortTalkInfo.pdf

18:16



Start Atlanta, Georgia news | Atlanta Journal-Constitution Netscape 6

AJCClassifieds | JOBS | HOMES | CARS | SUBSCRIBE TO THE AJC

# The Atlanta Journal-Constitution

ajc.com

[News](#) | [Metro](#) | [Sports](#) | [Business](#) | [Living](#) | [Opinion](#)

[Bellsouth Yellow Pages](#) [Sales and Shopping](#)

Thu • Apr 18  
 Current temp: 86  
[Weather](#)

**Find a job**  
**Find a home**  
**Find a car**  
**Marketplace**

## WEEKEND ENTERTAINMENT GUIDE

**Lotsa music!**  
 Alan Jackson, Willie, String Cheese, more.  
[Lineups, schedule](#)

**Rock's big role**  
 "Scorpion King" has action, but lacks bite.  
[Review](#) | [Other films](#)

**Sushi done right**  
 Taka menu takes an inventive approach.  
[Review](#) | [Dining Guide](#)

**BREAKING NEWS**  
**Small plane slams**

**News Break**

accessAtlanta  
 A-List Events  
 Movie Showt

Document: Done (5.047 secs)

```

emacs@MERION
Buffers  Files  Tools  Edit  Search  Mule  Help
CHI - don't forget
* slides and laptop
* demo application
* hair brush
--\ ** *scratch* (Lisp I
  
```

C:\duke\current-s...

File Edit View F >>

Back Forward Home

Address  Go

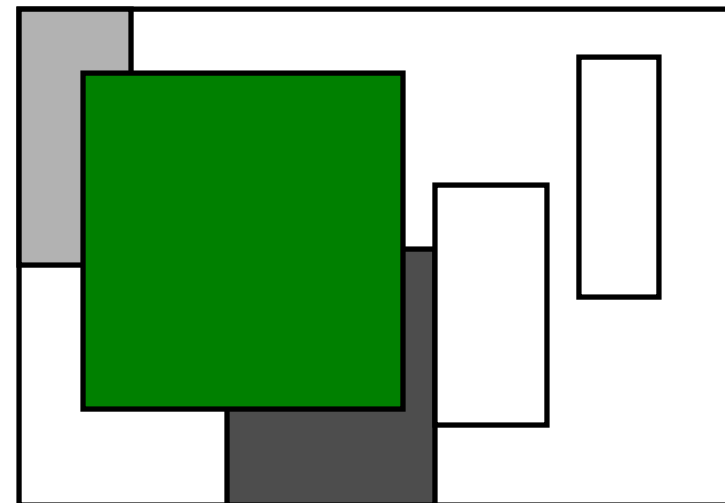
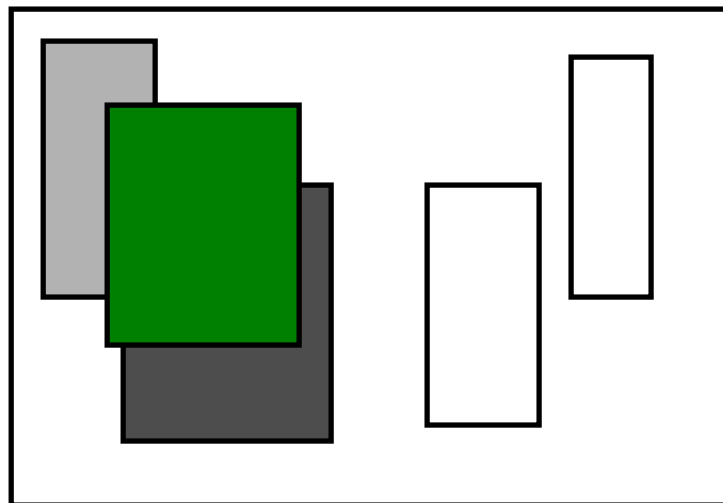
Name ▲

- presentation
- chi2002-registration.html
- chi-short-review.txt
- hotel-registration.html
- hutchings-stasko-quickspace.pdf
- salzmann-short-talks-email.txt
- ShortTalkInfo.pdf

18:18

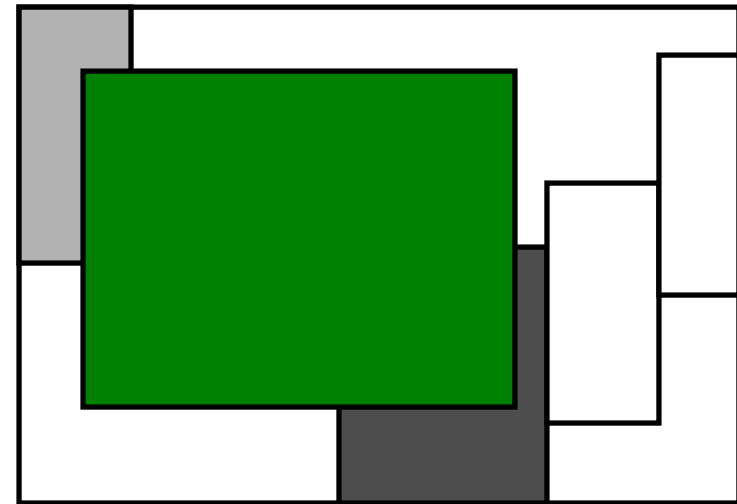
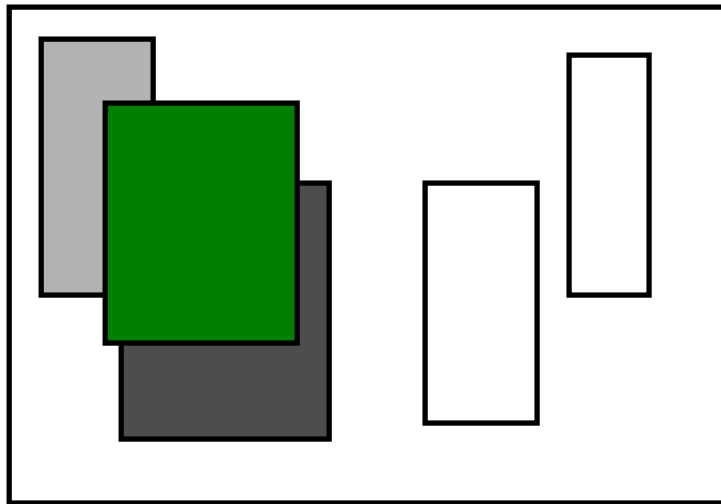


# friendly expand





# friendly shove





[demo]



Dugald Hutchings  
John Stasko



- ❏ any window that growing window overlaps
- ❏ calculation of overlap relationship
- ❏ option to “take friends” or “ignore friends”





- ❏ recover from any series of move, resize, expand, or shove
- ❏ useful especially if effects unintended





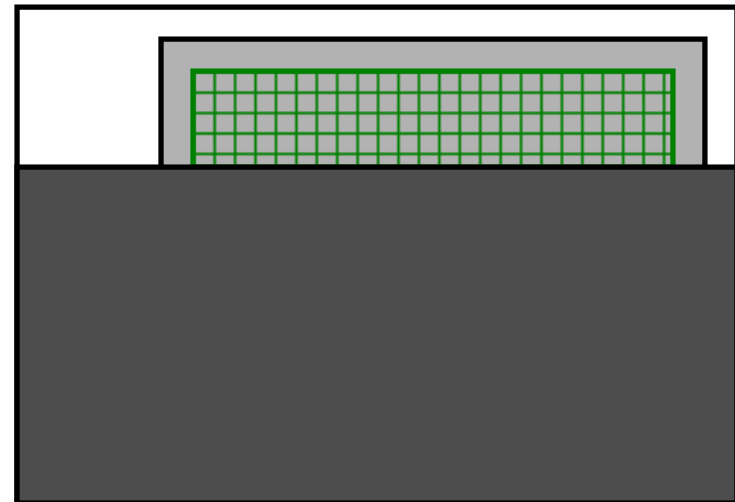
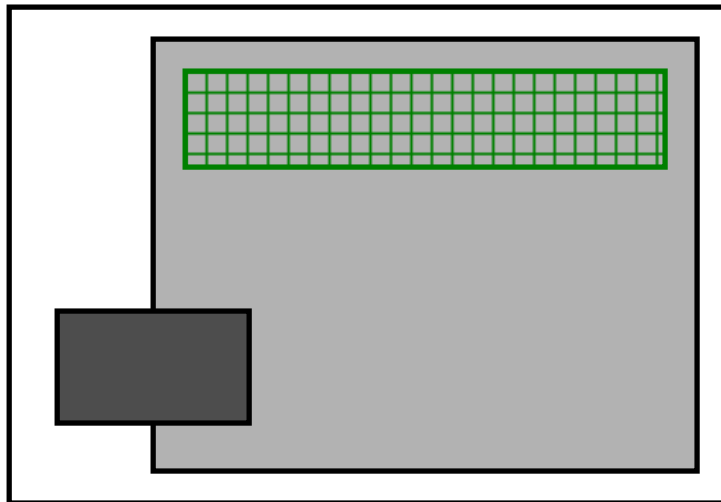
- ❏ **tiling or overlapping desktops**
- ❏ **simplicity of operations (one-click)**
- ❏ **metaphor to physical world**
- ❏ **information preservation**







# relevant regions



Start

My Computer Recycle Bin

1. DJ F...

gaia.cc...

duke h...

web re...

emacs...

C:\duk...

Atlanta...

17:53 18

Untitled...

17:53

gaia.cc.gatech.edu - SecureRT

File Edit View Options Transfer Script Window Help

**PINE 4.21 MESSAGE INDEX** Folder: INBOX Message 1 of 18

+	1 Apr 18	Elizabeth	(1,850)	Re: CHI 2002: Short Talk Presentation	
+	2 Apr 18	help	(2,414)	help	
+ A	3 Apr 18	megan	(2,286)	atlanta plans may 2-6	
+	4 Apr 18	Mark	(2,491)	Re: Reschedule Oral Exam	
+	5 Apr 17	Elizabeth	(4,022)	Greetings from your Session Chair!	
+ A	6 Apr 17	Marilyn	(16,739)	Re: CHI 2002: Short Talk Presentation	
+	7 Apr 17	Mitch	(1,467)	Re: meeting	
+	8 Apr 17	Gregory	(2,671)	Re: Reschedule Oral Exam	
+	9 Apr 16	Idris	(1,642)	GSC minutes and other sundries	
	10 Apr 15	cetlhelp	(2,868)	Spring term course surveys now open	
+ A	11 Apr 11	Marilyn	(12,705)	Re: CHI 2002: Short Talk Presentation	
	12 Apr 10	Gregory	(4,239)	[hci] [Fwd: HCI Seminar Registration]	
+	13 Apr 10	Mitch	(14,832)	Re: potential problem	
+ A	14 Apr 10	Mitch	(200K)	Re: tomorrow it is	
	15 Mar 19	Chad	(1,700)	[slush] Summer Registration starts We	
A	16 Mar 5	Marilyn	(5,095)	CHI 2002: Short Talk Presentation Inf	
+	17 Jan 28	John	(5,259)	Re: some updates	
+	18 Jan 15	Gregory	(3,278)	Re: quals committee	

Atlanta, Georgia news | Atlanta Journal-Constitution - Netscape 6

AJCClassifieds JOBS

The Atlanta Journal-Constitution

ajc.com

Document: Done (2.404 secs)

Help FldrList PrevMsg NextMsg

OTHER CMDS [ViewMsg] NextPage

PrevPage Delete Reply

NextPage Undelete Forward

Start

My Computer Recycle Bin

1. DJ F...

gaia.cc...

duke h...

web re...

emacs...

C:\duk...

Atlanta...

17:53 18

Untitled...

gaia.cc.gatech.edu - SecureRT

File Edit View Options Transfer Script Window Help

**PINE 4.21 MESSAGE INDEX** Folder: INBOX Message 1 of 18

+ 1	Apr 18	Elizabeth	(1,850)	Re: CHI 2002: Short Talk Presentation
+ 2	Apr 18	help	(2,414)	help
+ A 3	Apr 18	megan	(2,286)	atlanta plans may 2-6
+ 4	Apr 18	Mark	(2,491)	Re: Reschedule Oral Exam
+ 5	Apr 17	Elizabeth	(4,022)	greetings from your session chair!
+ A 6	Apr 17	Marilyn	(16,739)	Re: CHI 2002: Short Talk Presentation
+ 7	Apr 17	Mitch	(1,467)	Re: meeting
+ 8	Apr 17	Gregory	(2,671)	Re: Reschedule Oral Exam
+ 9	Apr 16	Idris	(1,642)	GSC minutes and other sundries
10	Apr 15	cetlhelp	(2,868)	Spring term course surveys now open
+ A 11	Apr 11	Marilyn	(12,705)	Re: CHI 2002: Short Talk Presentation
12	Apr 10	Gregory	(4,239)	[hci] [Fwd: HCI Seminar Registration]
+ 13	Apr 10	Mitch	(14,832)	Re: potential problem
+ A 14	Apr 10	Mitch	(200K)	Re: tomorrow it is
15	Mar 19	Chad	(1,700)	[slush] Summer Registration starts We
A 16	Mar 5	Marilyn	(5,095)	CHI 2002: Short Talk Presentation Inf
+ 17	Jan 28	John	(5,259)	Re: some updates
+ 18	Jan 15	Gregory	(3,278)	Re: quals committee

Atlanta, Georgia news | Atlanta Journal-Constitution - Netscape 6

AJCClassifieds JOBS

The Atlanta Journal-Constitution

ajc.com

Document: Done (2.404 secs)

Help FldrList PrevMsg NextMsg Delete Undelete Reply Forward

OTHER CMDS [ViewMsg] PrevPage NextPage

Start

gaia.cc.gatech.edu - SecureRT

File Edit View Options Transfer Script Window Help

PINE 4.21 MESSAGE INDEX Folder: INBOX Message 1 of 18

+ 1	Apr 18 Elizabeth	(1,850) Re: CHI 2002: Short Talk Presentation
+ 2	Apr 18 help	(2,414) help
+ A 3	Apr 18 megan	(2,286) atlanta plans may 2-6
+ 4	Apr 18 Mark	(2,491) Re: Reschedule Oral Exam

Atlanta, Georgia news | Atlanta Journal-Constitution - Netscape 6

**AJCClassifieds** | **JOBS** | **HOMES** | **CARS** | **SUBSCRIBE TO THE AJC**

# The Atlanta Journal-Constitution

**ajc.com**

[News](#) | [Metro](#) | [Sports](#) | [Business](#) | [Living](#) | [Opinion](#)

© **BELLSOUTH** Yellow Pages [Sales and Shopping](#)

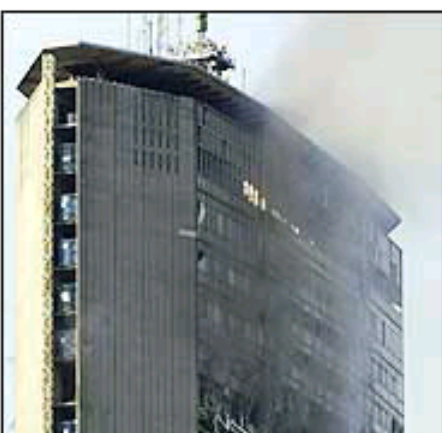
Thu • Apr 18  
**Current temp: 86**  
[Weather](#)

- Find a job**
- Find a home**
- Find a car**
- Marketplace**

- News**
- [Metro](#)
  - [The Vent](#)
  - [Cop briefs](#)
  - [Obituaries](#)
- Sports**
- [Braves](#)
  - [Falcons](#) | [Hawks](#)
  - [UGA](#) | [Tech](#)

## WEEKEND ENTERTAINMENT GUIDE

<p><b>Lotsa music!</b>          Alan Jackson, Willie, String Cheese, more.  <a href="#">Lineups, schedule</a></p>	<p><b>Rock's big role</b>          "Scorpion King" has action, but lacks bite.  <a href="#">Review</a>   <a href="#">Other films</a></p>	<p><b>Sushi done right</b>          Taka menu takes an inventive approach.  <a href="#">Review</a>   <a href="#">Dining Guide</a></p>
---	--	---



**BREAKING NEWS**

### [Small plane slams skyscraper in Italy](#)

Accident suspected: Four believed dead in Milan high-rise housing local government offices.

[Senate rejects oil drilling in refuge](#)  
 By a wide margin, Senate

**News Break**

- [Last season for 'Ally McBeal.'](#)
- [Announcers](#)

**Sunday's pa**  
 Save more th  
 \$210 in coup

**NEW! E-ma**  
 Sports, news  
 weekend pre  
 Sign up now  
 and win a Pa

**accessAt**

- [A-List Events](#)
- [Movie Showt](#)
- [Local Web s](#)

Need things  
 Our local we  
 planner [ema](#)

Get the latest



- ✎ some changes since the paper was submitted
- ✎ replace friends with neighborhoods
- ✎ model of window overlaps
- ✎ precise, robust algorithms





- ❏ change principles for different operations
- ❏ sacrifice glancing at a window for simple finding of a window
- ❏ evaluation of the operations





**Thank You!**

**Dugald Hutchings & John Stasko**



**Information  
Interfaces**

[www.gvu.gatech.edu / ii / space](http://www.gvu.gatech.edu / ii / space)