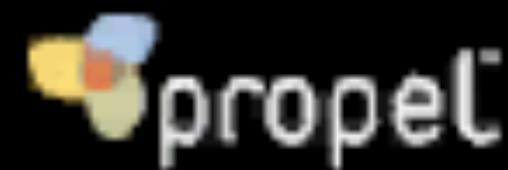


Form Me To You
And Back Again



Small Multiples

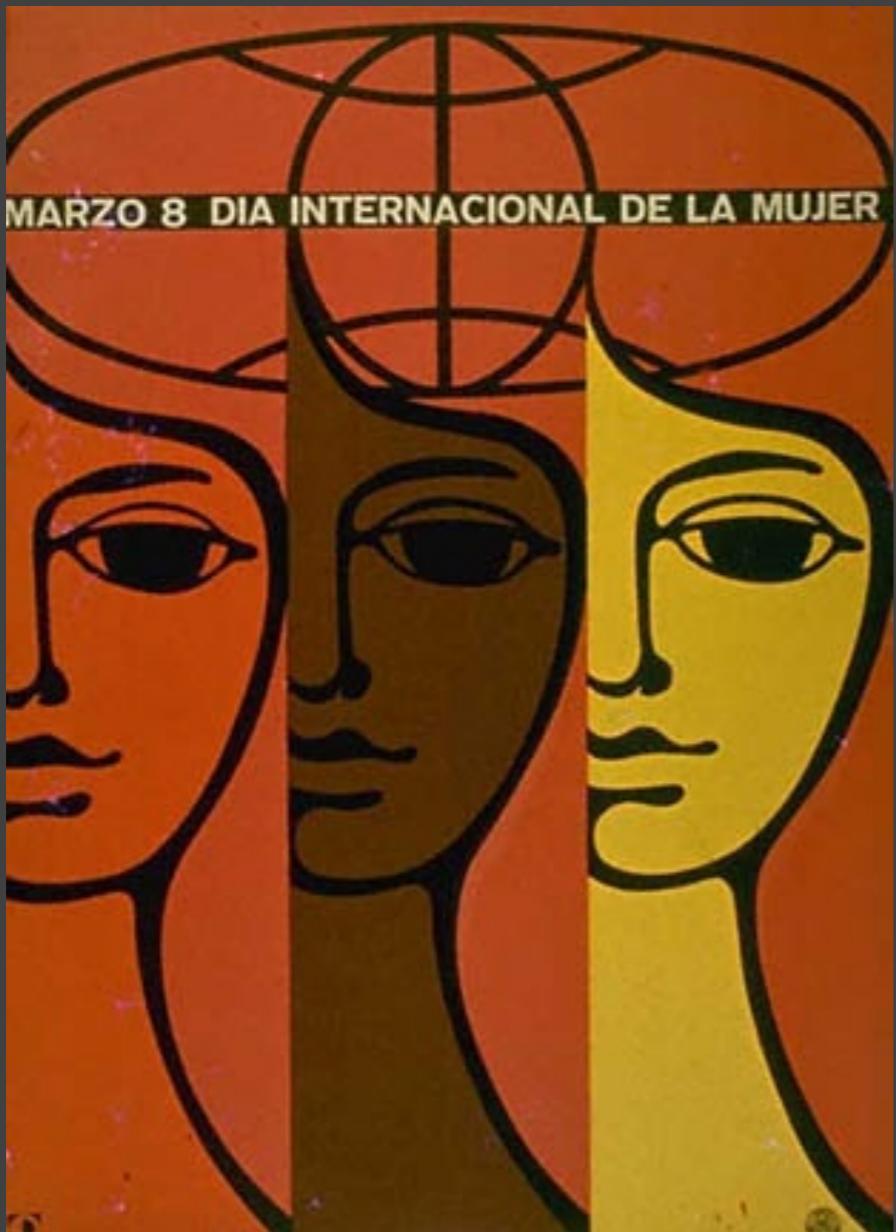
- Economy of line
- Many similarities enable us to notice differences



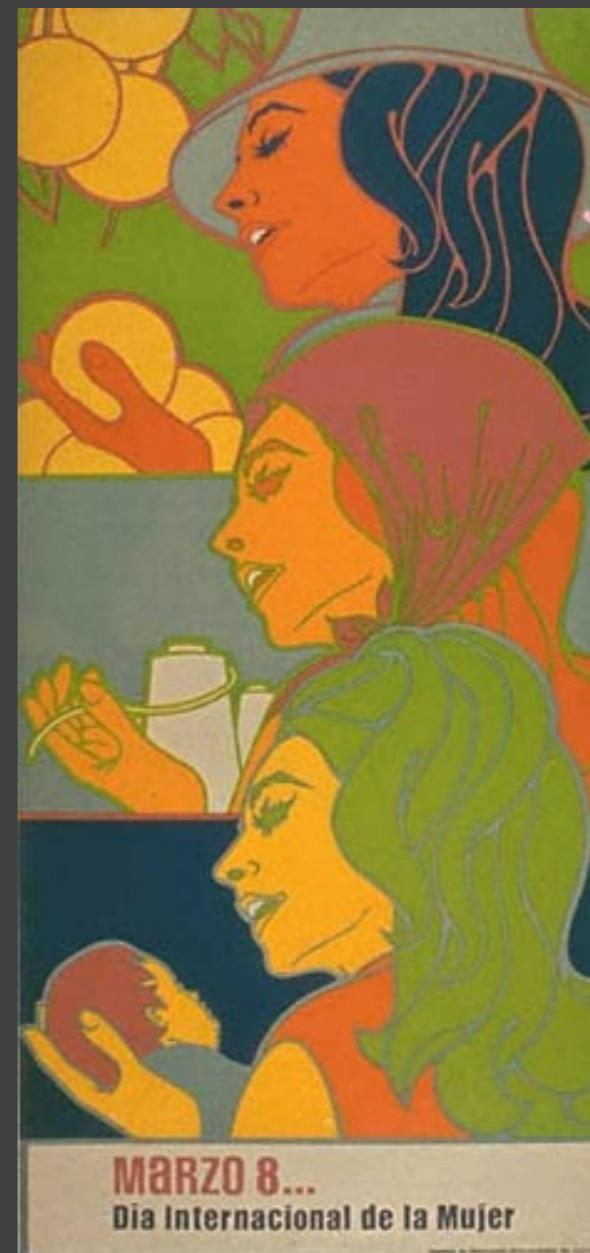
The person is gray... just enough to tell us there is a person. The important thing is that they are holding lights and what they are doing with the lights (the important information is bright - red & yellow)

SMALL MULTIPLES

International Women's Day



Echeverria, Heriberto 1971
March 8 - International Women's Day



Diaz, Estela 1974
March 8 - International Women's Day

Cuban Poster Art Gallery, <http://www.sims.berkeley.edu/~lcush/GenCat.html/>

Small multiples convey the important information:

multi-racial society & everyone is included (same exact form – the only data is the different colors!)

The woman is the same – but different professions. A woman can be anything she wants! Everyone is included.

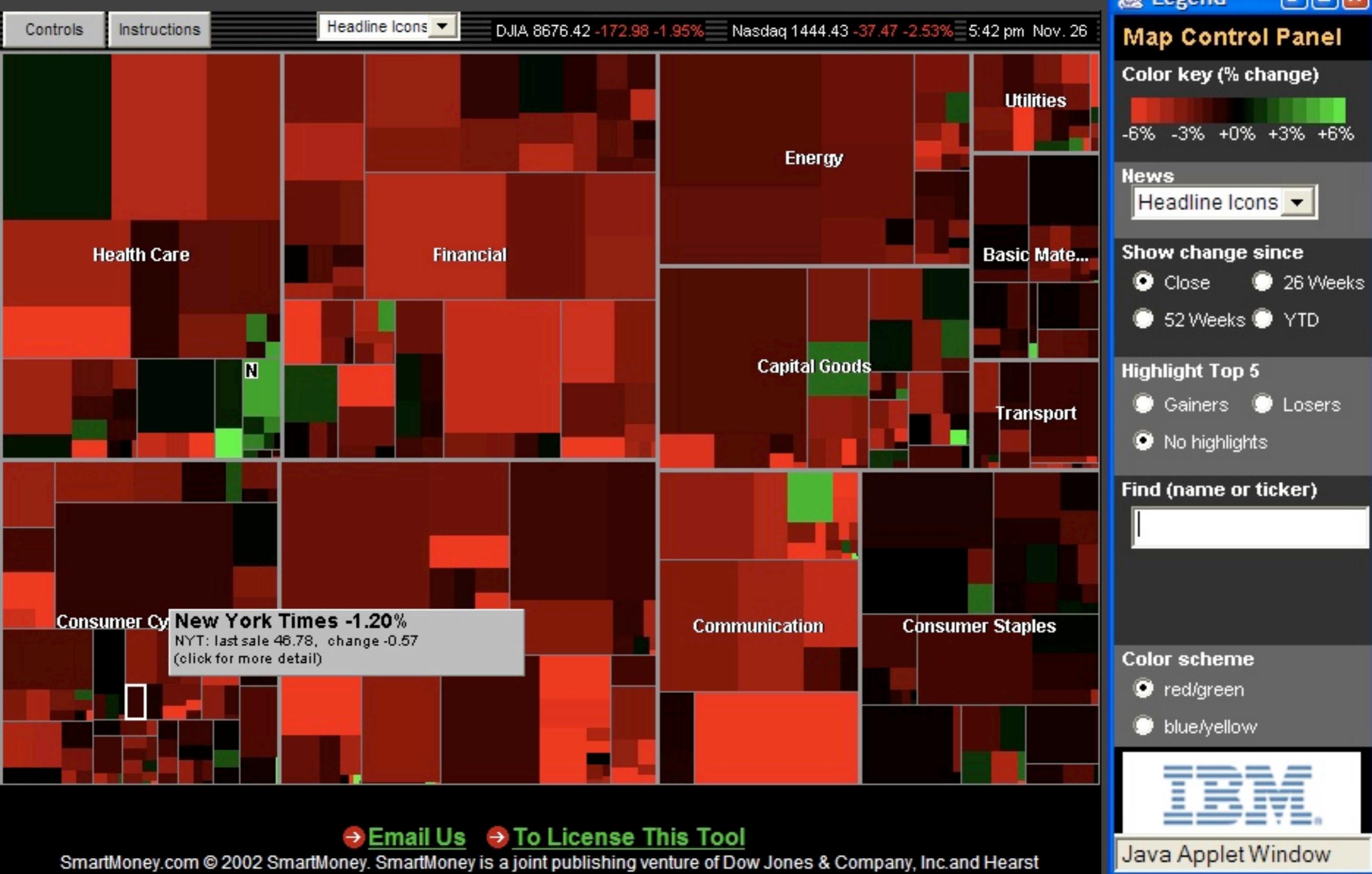
SMALL MULTIPLES

Reid Miles, Blue Note Cover

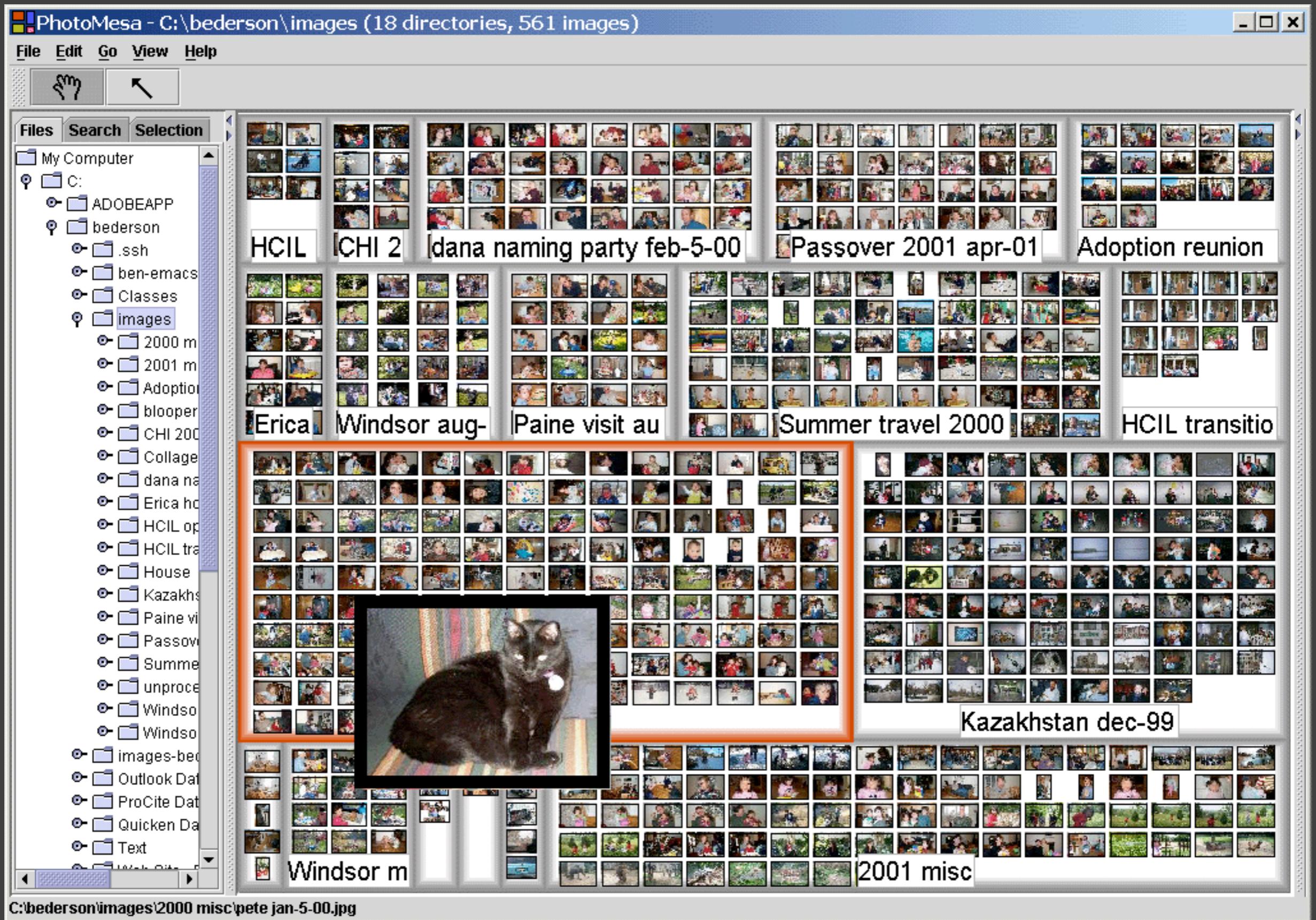


Small multiples for a visual pun. Tina Brooks is blue like all of the squares.

Tree Maps (SmartMoney)



Tree Maps (PhotoMesa)



C:\bederson\images\2000 misc\pete jan-5-00.jpg

Same technique.

Design Galleries

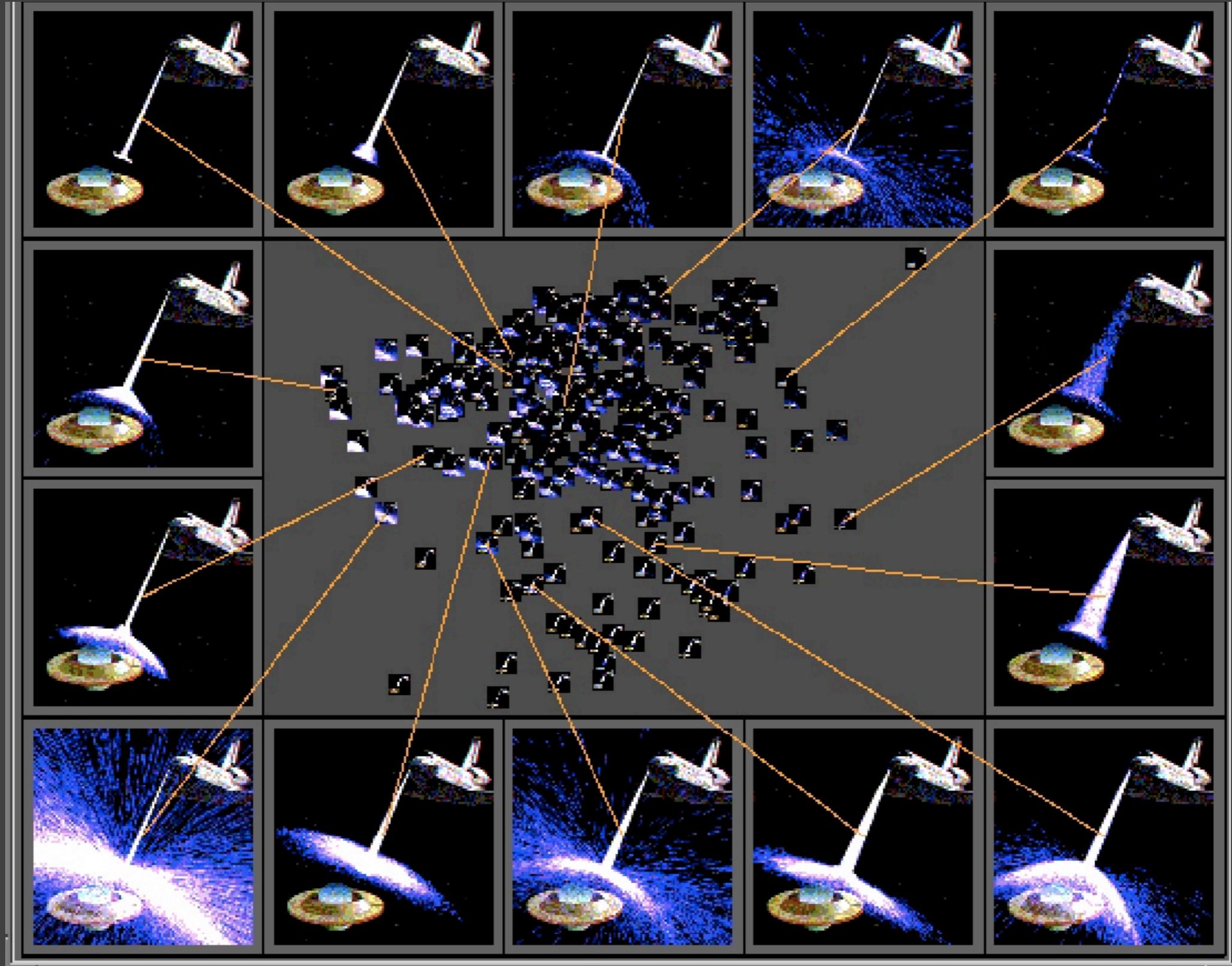


Figure 15: A DG for a particle system.

From Mitsubishi Research. If I use a slider, most systems give me no idea of what that control will do.

Design galleries let me preview the possible changes (a few examples large, lots of examples small).

Design Galleries

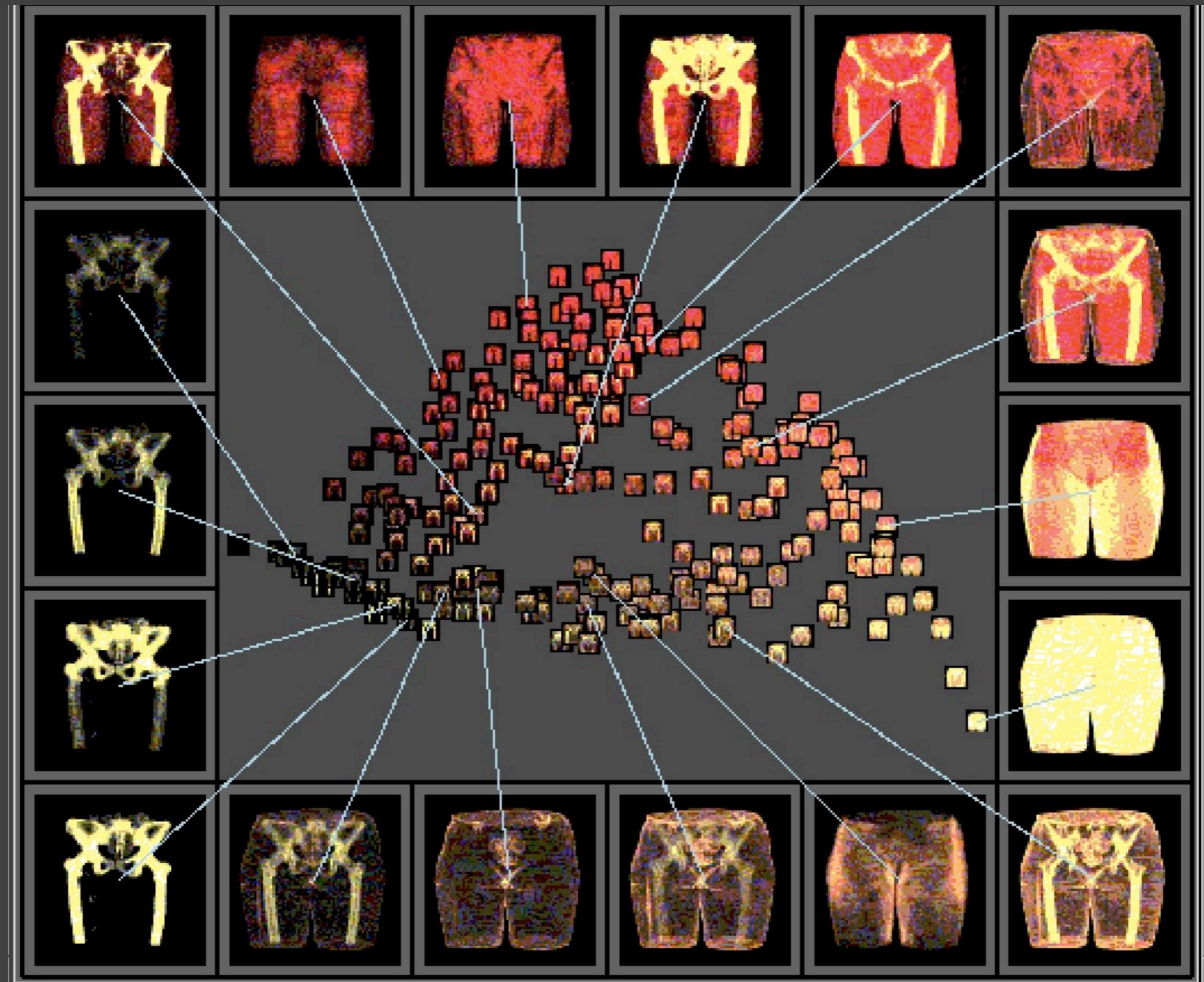


Figure 13: A DG with different opacity transfer functions.

Medical visualization

- a doctor where I want to see both the bones & the muscles. What colors should I apply to the data coming off the CAT Scan?

One tennet. Whenever you can explain something with a picture, it is better than text. When you can explain it with both, it is even better.

Basics of info. viz.

- Overview first
- Zoom and filter
- Details on command

(Shneiderman)

CHALLENGER



Challenger Disaster

HISTORY OF O-RING DAMAGE ON SRM FIELD JOINTS

SRM No.	Cross Sectional View			Top View		Clocking Location (deg)
	Erosion Depth (in.)	Perimeter Affected (deg)	Nominal Dia. (in.)	Length Of Max Erosion (in.)	Total Heat Affected Length (in.)	
22A	None	None	0.280	None	None	36°--66°
22A	NONE	NONE	0.280	NONE	NONE	338°-18°
15A	0.010	154.0	0.280	4.25	5.25	163
15B	0.038	130.0	0.280	12.50	58.75	354
15B	None	45.0	0.280	None	29.50	354
13B	0.028	110.0	0.280	3.00	None	275
11A	None	None	0.280	None	None	--
10A	0.040	217.0	0.280	3.00	14.50	351
2B	0.053	116.0	0.280	--	--	90

*Hot gas path detected in putty. Indication of heat on O-ring, but no damage.

**Soot behind primary O-ring.

***Soot behind primary O-ring, heat affected secondary O-ring.

Clocking location of leak check port - 0 deg.

OTHER SRM-15 FIELD JOINTS HAD NO BLOWHOLES IN PUTTY AND NO SOOT NEAR OR BEYOND THE PRIMARY O-RING.

SRM-22 FORWARD FIELD JOINT HAD PUTTY PATH TO PRIMARY O-RING, BUT NO O-RING EROSION AND NO SOOT BLOWBY. OTHER SRM-22 FIELD JOINTS HAD NO BLOWHOLES IN PUTTY.

1 of 13 pages of material faxed to NASA by Morton Thiokol

Blow By History

SRM-15 Worst Blow-By

- o 2 CASE JOINTS (80°), (110°) ARC
- o MUCH WORSE VISUALLY THAN SRM-22

SRM 22 Blow-By

- o 2 CASE JOINTS ($30-40^\circ$)

SRM-13A, 15, 16A, 18, 23A 24A

- o NOZZLE Blow-By

HISTORY OF O-RING TEMPERATURES (DEGREES - F)

<u>MOTOR</u>	<u>MBT</u>	<u>AMB</u>	<u>O-RING</u>	<u>WIND</u>
DM-4	68	36	47	10 MPH
DM-2	76	45	52	10 MPH
QM-3	72.5	40	48	10 MPH
QM-4	76	48	51	10 MPH
SRM-15	52	64	53	10 MPH
SRM-22	77	78	75	10 MPH
SRM-25	55	26	29 27	10 MPH 25 MPH

1 of 13 pages of material faxed to NASA by Morton Thiokol

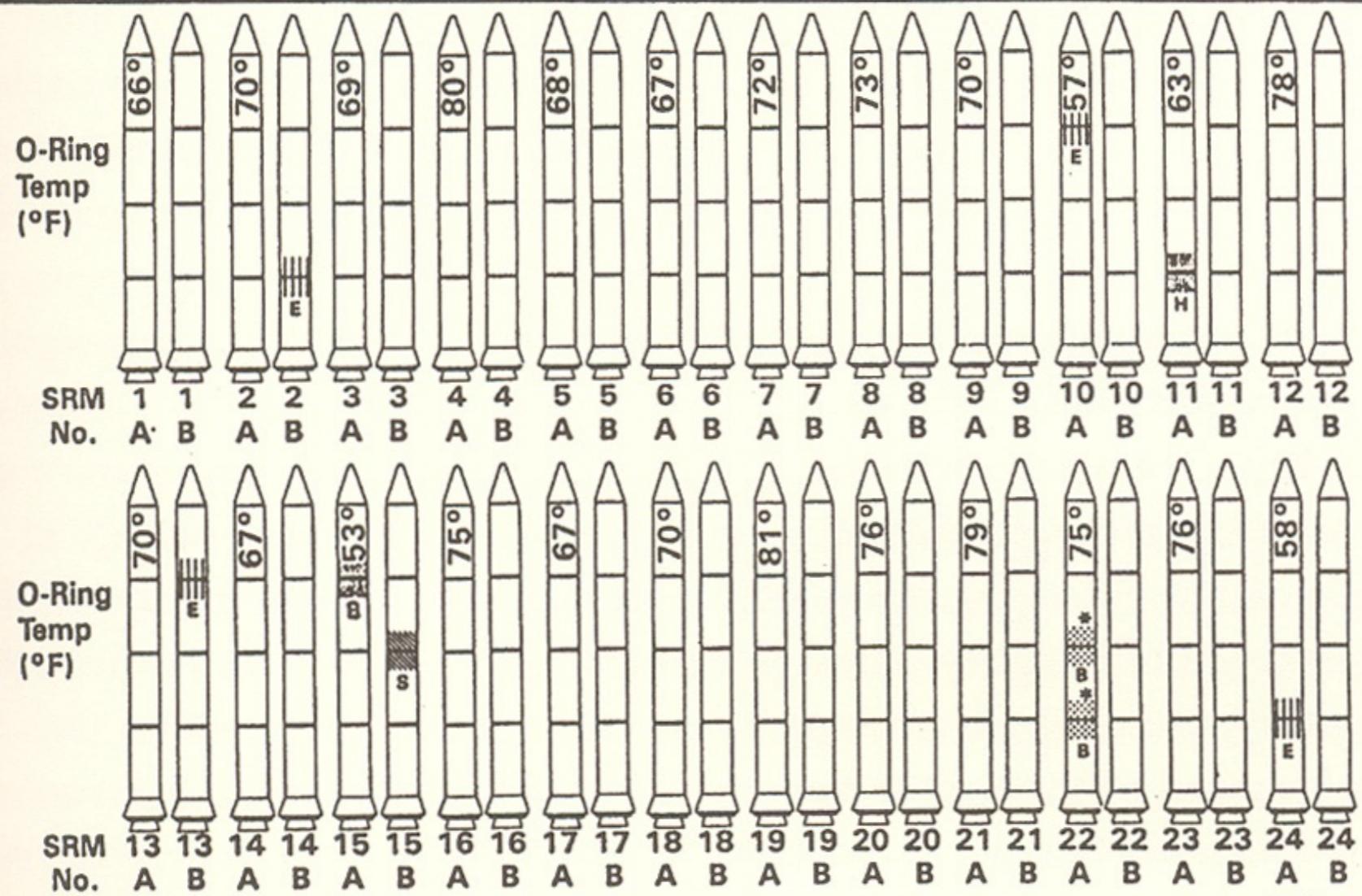
Shows only two of the launches (SRM 15 and SRM 22) where there were problems with blow-by..

In both cases there were problems, but the problems were worse in SRM 15

Conclusion - shouldn't launch at low temps... (faulty - what about the rest of the data? What about things besides blow-by?)

Point - should always be careful to include evidence of failures *and* successes... The differences are the important part!

History of O-Ring Damage in Field Joints (Cont)



Code	
	= Heating of Secondary O-Ring
	= Primary O-Ring Blowby
	= Primary O-Ring Erosion
	= Heating of Primary O-Ring
	= No Damage

MORTON THIOKOL, INC.
Wasatch Operations

* No Erosion

INFORMATION ON THIS PAGE WAS PREPARED TO SUPPORT AN ORAL PRESENTATION
AND CANNOT BE CONSIDERED COMPLETE WITHOUT THE ORAL DISCUSSION

E. Tufte, pp. 46-47 , Visual Explanations

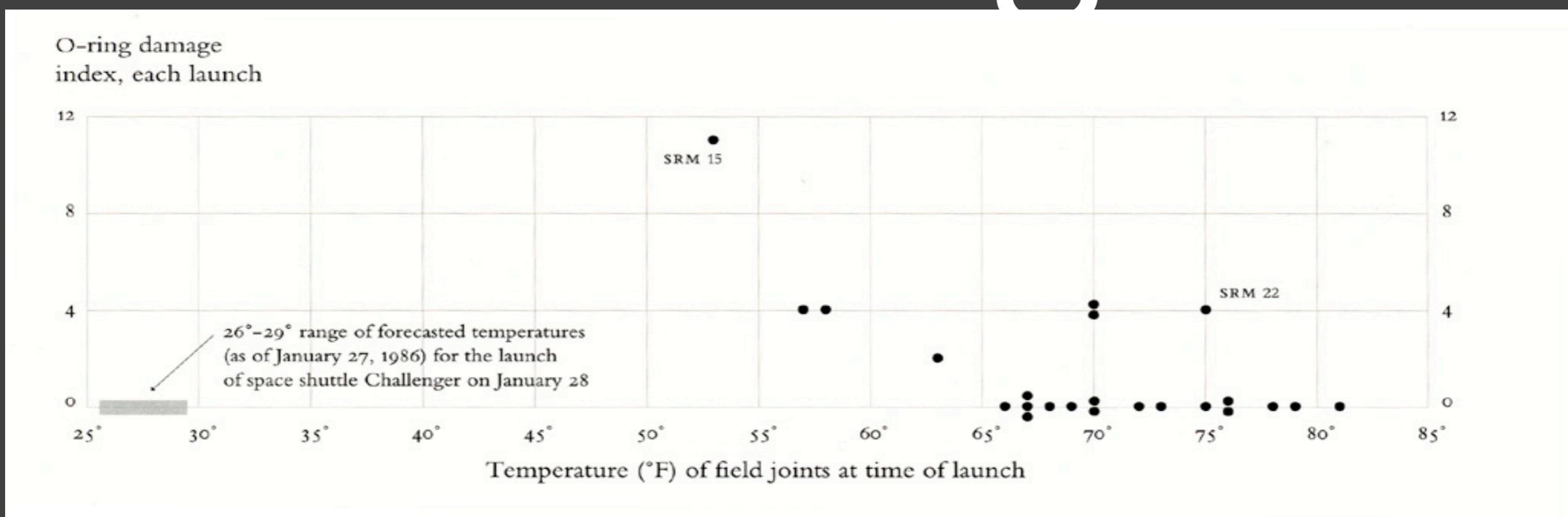
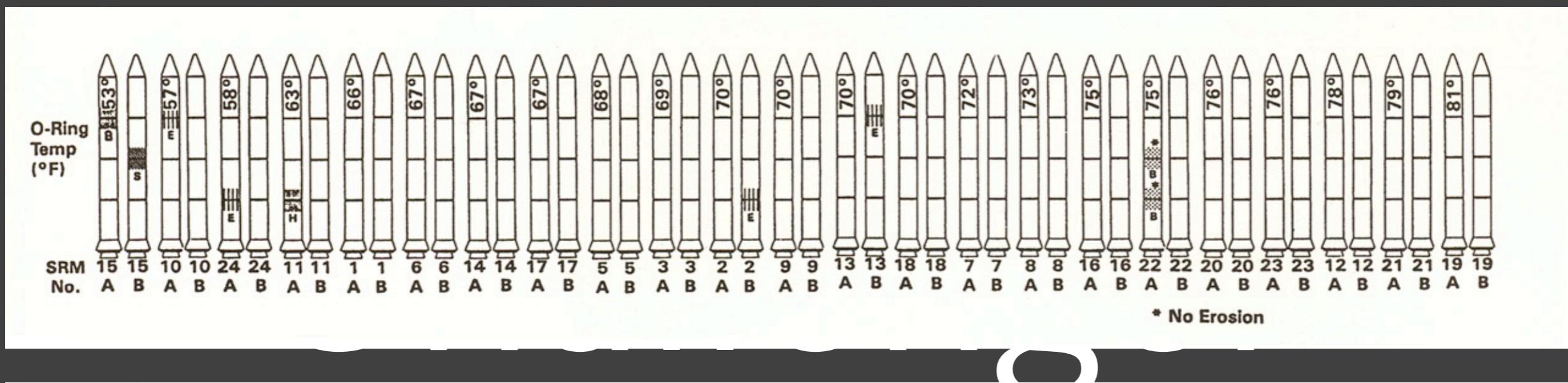
Problems:

chartjunk

Order the o-ring problems by temperature

Show both problems and non-problems

Extend the scale to make the point that the launch was much colder than all the previous launches



Redrawn by E. Tufte, p. 49 , Visual Explanations

Functions of visualizations

Communicate information to others

Make a point

Tell a story

Make decisions

Support analysis and reasoning

Answer a question

“One image = One diagnosis”

To explore and discover; encourage creativity

Look at things in a new way

“The purpose of computing is insight, not numbers” [R. Hamming]

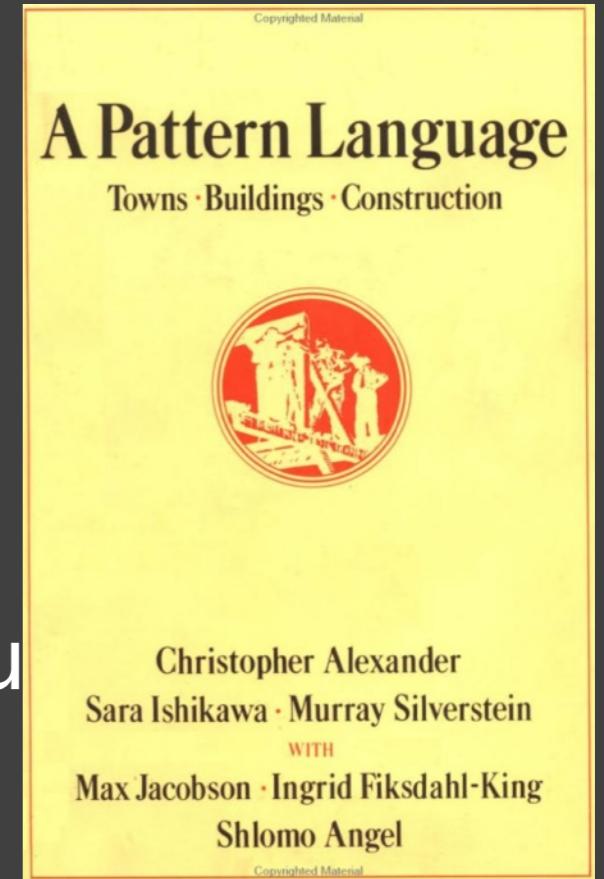
Inspire

The Purpose of Data Visualization is to
Help People Think and Communicate

The Importance of Patterns

Key options

- Design patterns
- Designing by example
- Users will work well with UI's that build on concepts that they are familiar with



Source: Alexander, Christopher. A Pattern Language. Oxford University Press, 1977. Klemmer, Scott, Examples Research.

Web Design Patterns

- Web patterns important and persistent(!)

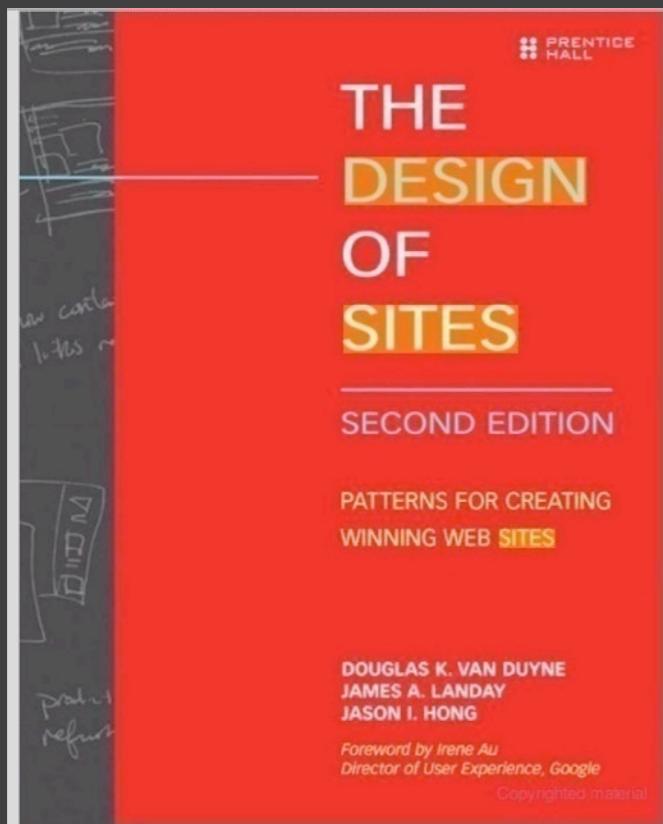


Figure 2.10

These screen shots illustrate the evolution of the homepages of CNN, MSN, Yahoo!, and Google from 2001 to 2006. Note that the core structure and the underlying **design** patterns used by these Web **sites** have not changed over the years. For the most part, the only major change to these Web **sites** has been an increase in information density.



2.10

(www.cnn.com, www.msn.com, www.yahoo.com, www.google.com)

Source: van Duyne, Doug and James Landay and Jason Hong. *The Design of Sites*. Prentice Hall, 2006.

start here
GO ANYWHERE

HOME

QUICKSHOP OR SEARCH

SEARCH SITE

EVERYTHING IS FORWARD

DEPARTMENTS

Men's

Women's

Kids'

OUTDOOR (near & distant)

Travel Gear & Apparel

Homes & Outdoor Living

Gift Certificates

OUTDOOR SERVICES

On Sale!

Corporate Sales

SLEEPING SERVICES

Free Catalog

L.L. Bean Store

Customer Help

VISIT THE STORE

Mobile Stores

Factory Stores

FREE HOME

24/7 MAIL

FAQs

SHIPPING

800-441-0712 (US/Canada)

International Help

start here
GO ANYWHERE

» Shop

Explore the Outdoors

Customer Service

Welcome! New to L.L. Bean? Start here

Inspired by innovation
since 1912

THE SKY'S THE LIMIT

Now at L.L. Bean

Spring 2002 Catalog

For your seasonal gateway to the outdoors. Free

L.L. Bean and Subaru

The L.L. Bean Subaru Outback reflects a partnership in quality.

L.L. Bean Classics

Bean Boots started our business and we still make them here in Maine.

On Sale!

Our Winter Sale

RECEIVE NEWS ON SALES & SPECIAL OFFERS

Enter your email address

Bean collects a secure cookie that respects your privacy. © L.L. Bean, Inc. 2002. L.L. Bean® is a registered trademark of L.L. Bean, Inc.

A1.1

(www.llbean.com, February 2, 2002)

Source: van Duyne, Doug and James Landay and Jason Hong. *The Design of Sites*. Prentice Hall, 2000.

Figure A1.1

L. L. Bean gives customers a sense of familiarity because the categories on the site (left) are similar to what they find in L. L. Bean's physical stores and catalogs. The bright colors, clean layout and navigation, and picture in the center work together to draw people in.

© 2006 NBC 3 Search Updated: 3 hours ago MSNBC Home Sign In msn

MSNBC TV | TODAY SHOW | NBC NIGHTLY NEWS | DATELINE NBC | MEET THE PRESS

MSNBC

Video
U.S. News
World News
Business
Sports
Entertainment
Tech / Science
Health
Weather
Travel
Blogs etc.
Local News
Newsweek
Multimedia
Most Popular

WIDGETS

Shopping
Jobs
Dating
www.msnbc.msn.com

Autos
Real Estate
www.msnbc.msn.com

ALSO ON MSNBC.COM

» Contractors
» Take 2 magazine

'DOING GREAT'
10-month-old conjoined twin girls successfully separated
Video

IN THE NEWS

- 10,000 coalition troops begin Afghan offensive
- Early-morning earthquake rattles Northern California
- NBC poll: 'Baby Bounce' in Bush approval | Video
- Fight over boy's circumcision goes to court | Video
- Wall Street rallies on good earnings, data | Video
- Mickelson seeks 3rd major in a row | Scoreboard

MSNBC NEWS HIGHLIGHTS

- First Read: Partisan, mature debate on Iraq war
- Are the Palestinians on the brink of civil war?
- U.S. ads spur breast-feeding debate | video

INSIDE MSNBC.COM

- Bus blast kills 62 in Sri Lanka; rebels suspected
- Bush apologizes for mocking journalist's 'shades'
- NBC: Stolen computer server stirs ID theft fears

CDW

You're ready to print now. Too bad your printer is still warming up. So that's why your printer was built.

HP LaserJet 2600n
Color Print
Up to 8 ppm monochrome
Network ready

Now just **\$349.99***

Call 1-800-225-4000
Order online
www.cdw.com

Offer subject to change without notice and availability of supplies.
www.cdw.com

www.msnbc.com, June 16, 2006

Figure C1.1

MSNBC gives readers a broad selection of topics to explore, while highlighting news of general interest. With its clearly distinguished links, customers need only a quick glance to see how to navigate the site. Subsections highlighted in the navigation bar show more detailed areas of interest. Readers can customize the news by entering a zip code to get local news.

G1 FEATURED PRODUCTS

The screenshot shows the homepage of 1-800-flowers.com. At the top, there's a navigation bar with links for 'home', 'flowers', 'gifts', 'gift baskets', 'terms & conditions', 'privacy policy', 'more', 'birthday gifts', and 'more...'. The top right features 'account login', 'shopping basket', and a search bar. A purple banner at the top right says 'Select Category'.

Florist Designed (with a 'Flowers' link) shows a bouquet of yellow and pink flowers in a vase, labeled 'Fields of Europe™ for Summer' at \$59.99 with a 'BUY NOW' button.

Fresh From Our Growers Weekly Special (with a 'Flowers' link) shows a bouquet of red and yellow roses, labeled 'Sweetheart Rose Bouquet' at \$29.99 - \$49.99 with a 'BUY NOW' button. It includes a purple banner 'BUY 24 GET 24 FREE'.

Father's Day Sale (with a 'Flowers' link) shows a bouquet of flowers, labeled 'Father's Day is Sunday June 18th'. It says 'SAVE 10% off select Flowers & Gifts'.

What's Hot (with a 'Flowers' link) lists: Father's Day - Save up to 20%, Same-day Delivery, Happy Hour, Growers Specials, Luxury Flowers & Gifts, Summer, \$100 Specials, Win a Weekend Getaway, Earn Points and SAVE, and Gifts under \$100.

Birthday (with a 'Flowers' link) lists: Flowers, Photo, Gift Baskets, Food Gifts & Essentials, Teddy Bears & More.

Occasions & Sentiments (with a 'Flowers' link) lists: Anniversary, Birthday Gifts, Get Well, Graduation, Just Because, Love & Romance, New Baby, Pets, Sympathy, Thank You, Wedding Flowers and Gifts.

Flower Type (with a 'Flowers' link) lists: Carnations, Daisies, Lilies, Orchids, Peonies, and Sunflowers.

Designer Flowers (with a 'Flowers' link) lists: Preston Bailey, Jane Carroll, Julie Vialpando, Jane Foster, Napo De Sweet, and Designer Flowers.

Sympathy & Funerals (with a 'Flowers' link) lists: Funeral Flowers, Funeral Plants, Funeral Services, and View All.

YOU COULD WIN A \$5,000 Backyard for Dad! (with a 'Flowers' link) has a 'ENTER NOW' button.

Luxury Flowers & Gifts (with a 'Flowers' link) has a 'Shop Now' button.

Customer Service (with a 'Flowers' link) lists: Address Book, Help/FAQs, About Us, Terms of Use, Employment, Store Locations, Privacy, Franchise, International Flower Delivery, Business Office, Contact Quick Order, Site Map, Same Day Flower Delivery, Join Fresh Flowers, Flower Boxes, Virtual Flowers, Gift Baskets, Birthday Flowers, and Copyright © 2006 1-800-FLOWERS.COM, INC.

Figure G1.1

1-800-flowers.com highlights several kinds of featured products, including "Florist Designed," as well as specials like "DOUBLE POINTS!" and "SAVE 10%." The attractive photographs also give the flowers a seductive quality.