



DISTINGUISHED
LECTURE
SERIES 2018

The End of the Road for General Purpose Processors & the Future of Computing

DEC. 3, 2018 (MONDAY)
11:40AM-12:40PM
DAVIS AUDITORIUM



John Hennessy
Stanford University

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COMS W4170 *Programming by* *Demonstration 2*

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Peridot B. Myers 1987

- Programming by Example for Real-time Interface Design Obviating Typing
- Creates new GUI widgets
 - User-defined look and feel
- Designed for nonprogrammer users
- One of earliest uses of inferencing for PBD
- Inferencing for
 - Graphical constraints (user gives one example)
 - Iteration (user gives two examples)
 - ...

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Peridot B. Myers 1987

```
command: to Peridot
Welcome to Peridot
Please type a name for the procedure you will create [e.g.: MyMenu] PropSheet
How many arguments do you want for PropSheet? [e.g. 1] 1
Now type the name of argument # 1 for PropSheet [e.g.: Items] Items
Now you will type an example value for each argument. Remember to use parentheses if you want a list
e.g.: (Replace Move Copy) and "" if you want to include a space (e.g. "Single item").
Please type an example value for Items
[e.g.: (Replace Move Copy)] (Bold Italic StrikeThrough Underline Superscript Subscript Inverted)
If you want any values that can change at run time (called active values) then type them next.
You will probably want at least 1 active value to hold the return value.
How many active values do you want for PropSheet? [e.g. 1] 1
Now type the name of active value # 1 for PropSheet: [e.g.: CurrentChoice]
```

⋮

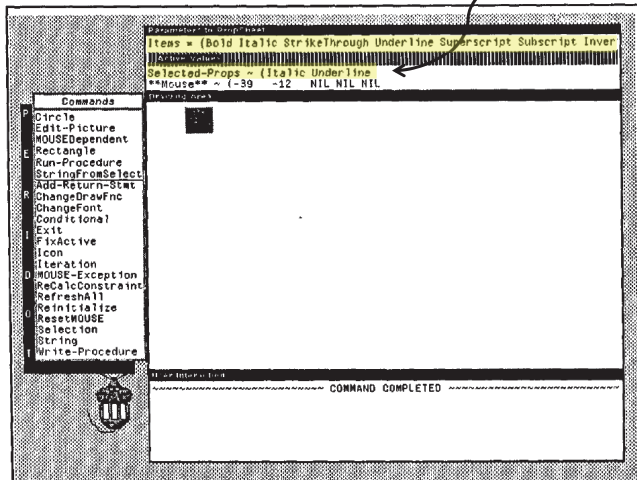
Should show user's input:
"Selected-Props" and its value
"(Italic Underline)"

- Procedure PropSheet (Items)
 - ActiveValue Selected-Props

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Peridot B. Myers 1987

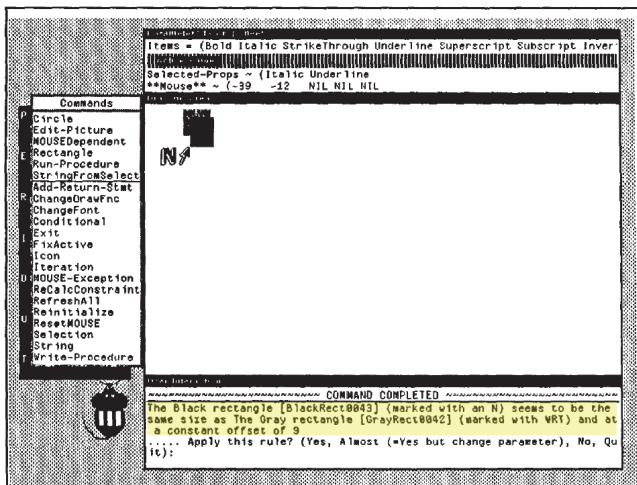
Note value of "Selected-Props"



User creates gray rectangle

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Peridot B. Myers 1987

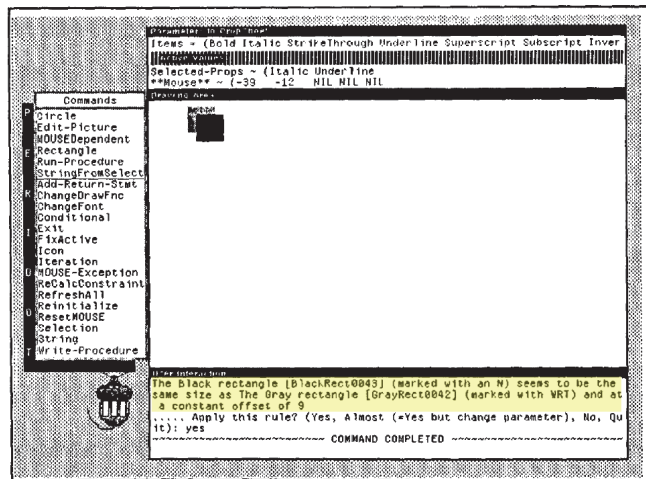


User creates black rectangle

Peridot proposes constraint

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Peridot B. Myers 1987

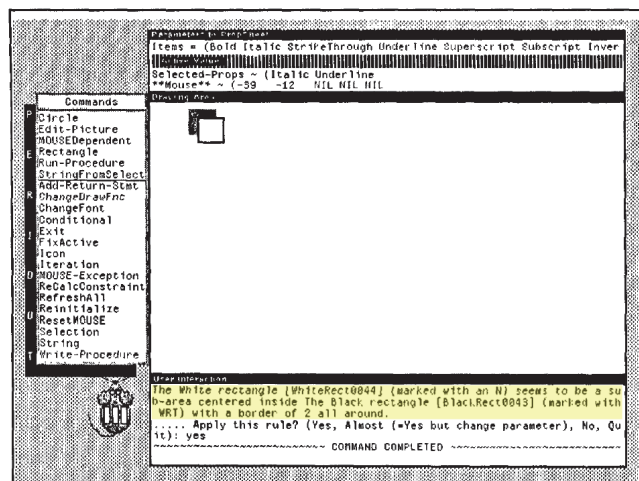


Peridot establishes constraint:

Black rectangle is now the same size as gray rectangle and at the specified offset

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Peridot B. Myers 1987

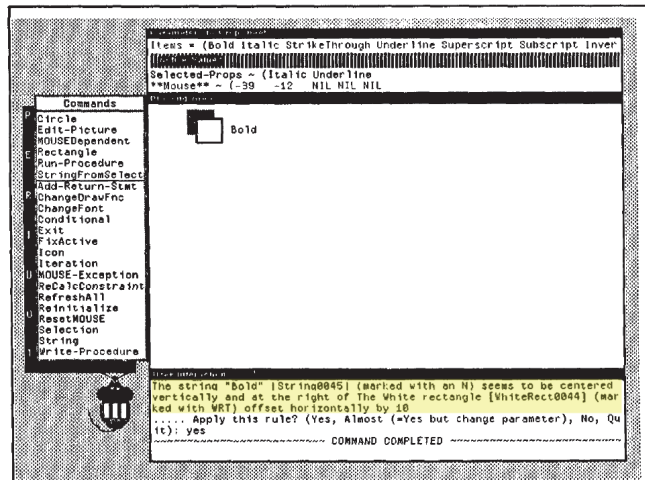


User creates white rectangle

Peridot proposes constraint

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Peridot B. Myers 1987

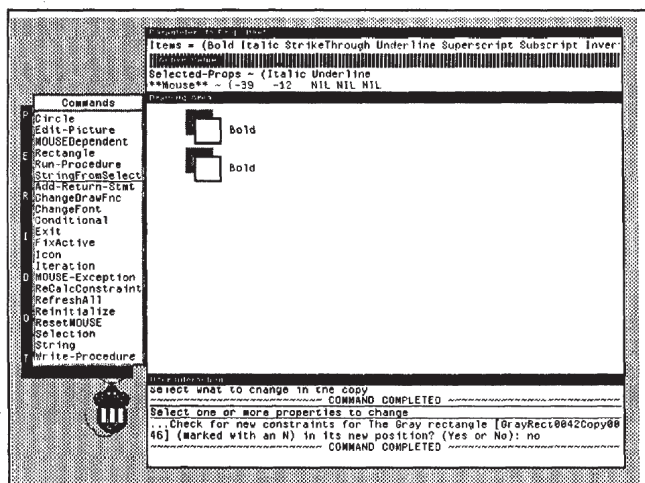


User creates string "Bold"

Peridot proposes constraint

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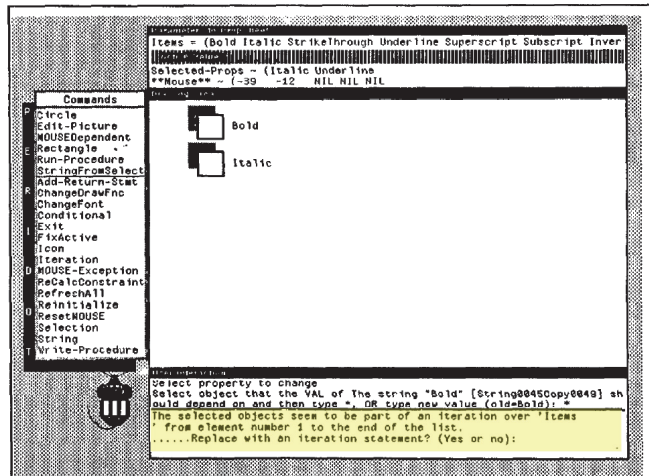
Peridot B. Myers 1987



User selects and copies rectangles and text

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Peridot B. Myers 1987

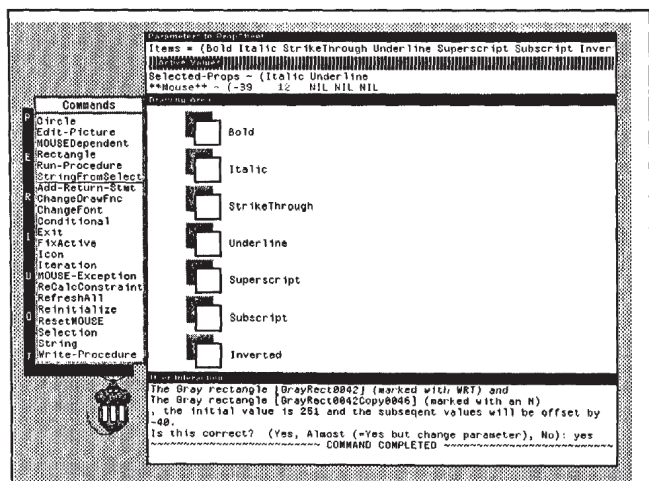


User changes
"Bold" to
"Italic"

Peridot infers
an iteration
over the
elements in
"Items" and
asks user to
confirm

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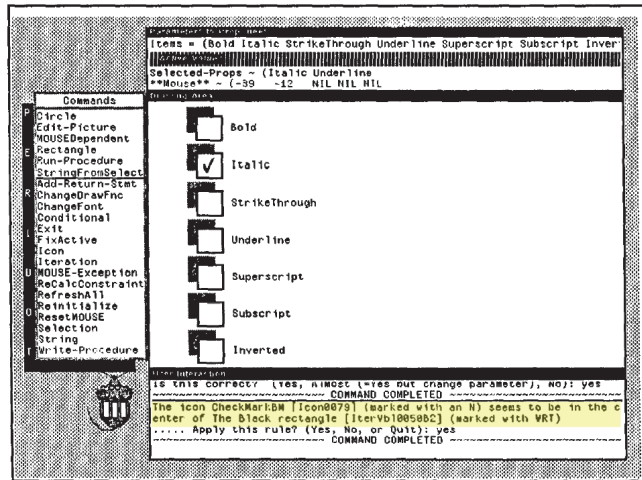
Peridot B. Myers 1987



Peridot
performs the
iteration

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Peridot B. Myers 1987

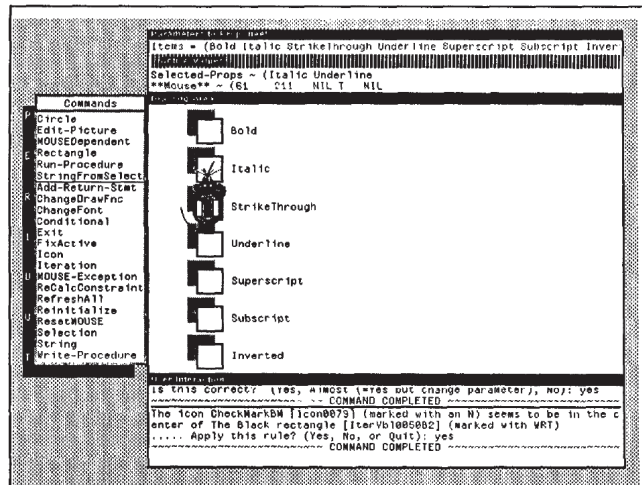


User places
check mark
icon in box

Peridot
proposes
constraint

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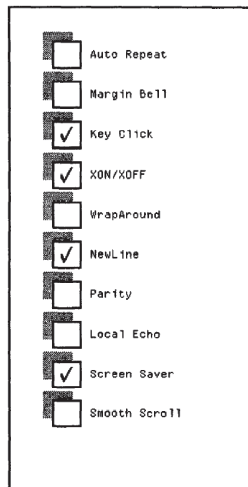
Peridot B. Myers 1987



- User places simulated mouse over check mark with middle button down, indicating a mouse dependency
- Peridot infers dependency on the single active value → check mark for all items in the single active value list (italic, underline)
- User selects mouse action (e.g., toggle value)

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Peridot B. Myers 1987

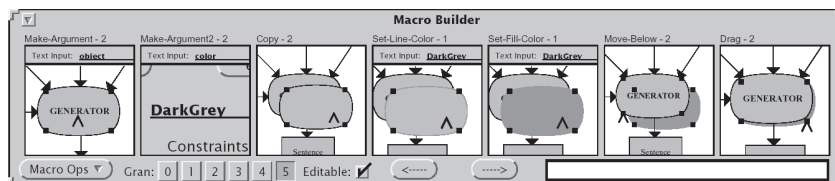


- Widget created with Peridot can now be used with current “Items” list or with different “Items” list
 - Different item strings
 - Different number of items

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Chimera D. Kurlander 1988–92

- Example-based graphical editing
 - Editable graphical histories
 - Comic-strip/storyboard metaphor
 - Inspect to review
 - Revert to undo
 - Edit to change/redo
 - Select, parameterize, generalize to create “macros by example”

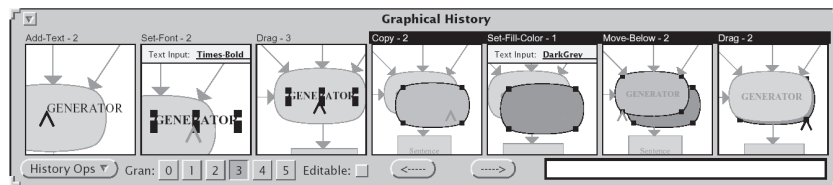


<https://www.youtube.com/watch?v=JbrJQW25ekl>

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Chimera D. Kurlander 1988–92

- Graphical history can be used to select past actions



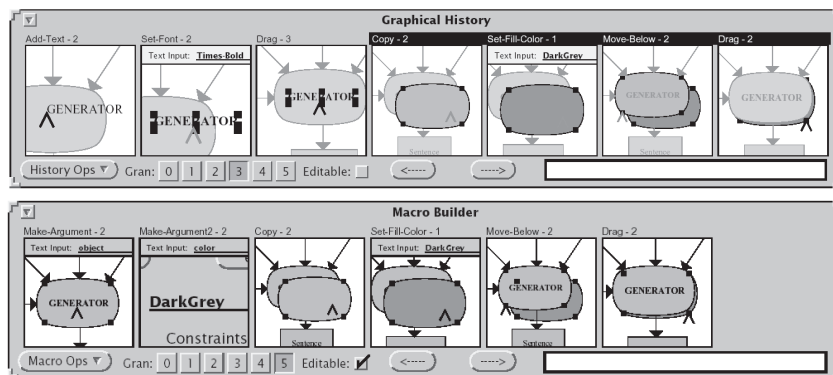
<https://www.youtube.com/watch?v=JbrJQW25ekI>

7:00-14:30

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Chimera D. Kurlander 1988–92

- Graphical history can be used to select past actions

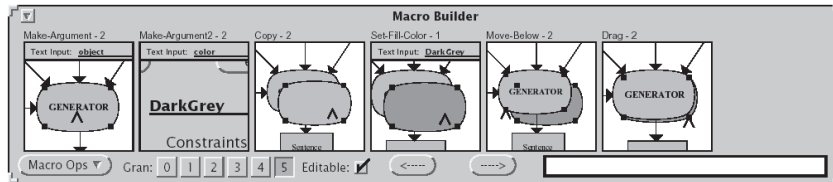


<https://www.youtube.com/watch?v=JbrJQW25ekI>

7:00-14:30

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Chimera D. Kurlander 1988–92



Macro creation

Confirmation of inferences

Generalize DRAG

Explain selection. Choose one:

☒ 1. An object created in panel #3.

Describe the caret motion during the drag. Choose one:

☒ 1. Move caret relatively by (-8.0 7.7)

☐ 2. Move caret absolutely to (25.8 510.9)

Apply Reset

Macro Invocation

Add Drop Shadow

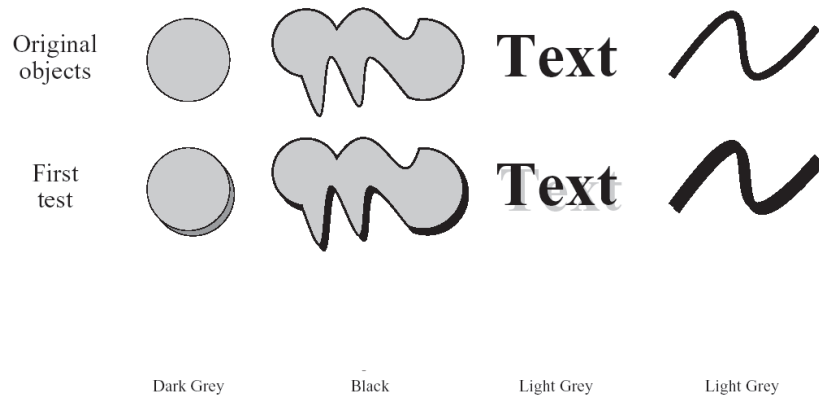
object: Set Show

color: DarkGrey

Apply

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Chimera D. Kurlander 1988–92

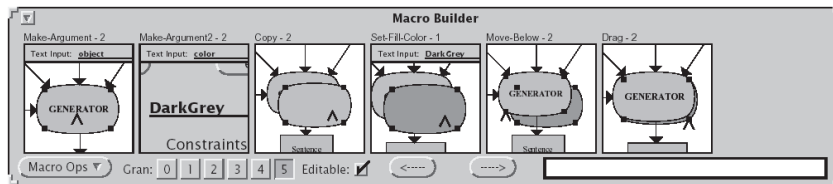


Testing

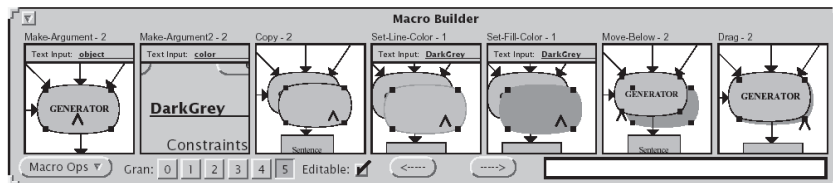


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Chimera D. Kurlander 1988–92

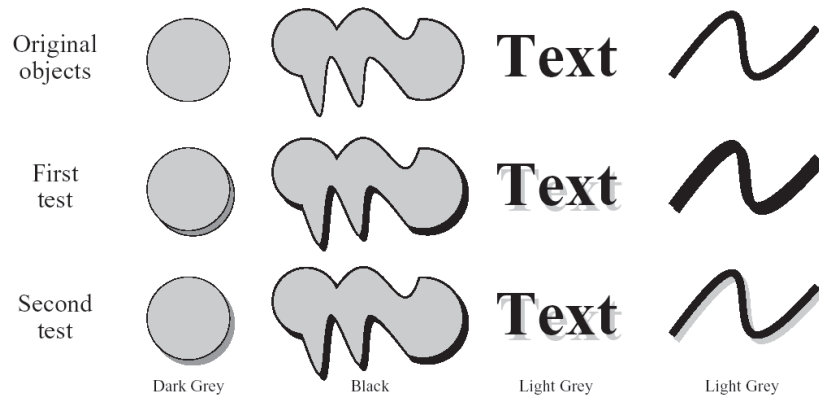


Debugging



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Chimera D. Kurlander 1988–92

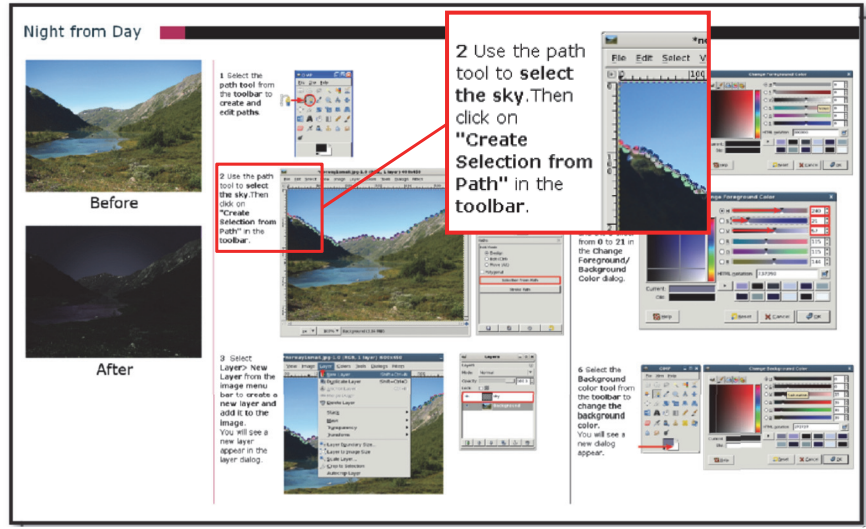


Testing again

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Generating Photo Manipulation Tutorials

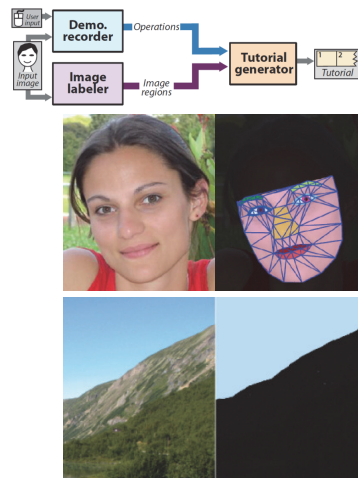
F. Grabler et al. SIGGRAPH 2009



Generating Photo Manipulation Tutorials

F. Grabler et al. SIGGRAPH 2009

- Implemented in Gimp
- Capture UI state and app state
 - Prune changes that don't make a difference
- Use existing vision-based recognition/labeling techniques to classify parts of images
 - E.g., faces, landscapes
 - Use heuristics to generate related text
 - Relative location, "nose", "eyes" (and parts: "left pupil", "right iris", "sky")



Generating Photo Manipulation Tutorials

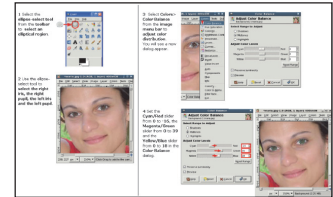
F. Grabler et al. SIGGRAPH 2009

- Tutorial Generation
 - One step per major image processing operation
 - Aggregate related and repeated actions (e.g., parm tweaking)
 - Annotate screenshots with arrows and highlights corresponding to user actions
 - Crop to include only "relevant" portions
 - Generate text descriptions
 - Template-based "fill in the blanks" approach
 - Lay out screenshots and text in grid
 - Use text (on left)-screenshot (on right) pairs
 - Use before-after screenshot pairs to show consequences
 - Use screenshots of multiple actions when necessary
 - Stack pairs in columns, laid out left-to-right
 - Include before-after screenshot pair at left for entire task
- Berthouzoz et al., *ACM Trans. on Graphics* 2011 generalizes to create parameterized macros

Set Param: Saturation 0→5
Set Param: Lightness 0→5
Set Param: Lightness 6→12
Set Param: Saturation 5→15



Slider: Set the <param name> slider from <param value before> to <param value after> in the <dialog name> dialog.



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Generating Photo Manipulation Tutorials

F. Grabler et al. SIGGRAPH 2009

- Follow-on work: *Adobe Tutorial Builder* for Photoshop
 - <http://labs.adobe.com/technologies/tutorialbuilder/>



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