Chimera  D. Kurlander 1988–92

- Graphical history can be used to select past actions
**Chimera**  D. Kurlander 1988–92

Macro creation

Confirmation of inferences

Macro Invocation

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**Chimera**  D. Kurlander 1988–92

Original objects

First test

Testing
**Chimera D. Kurlander 1988–92**

Debugging

**Chimera D. Kurlander 1988–92**

Original objects

First test

Second test

Testing again
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
  - One step per major image processing op
  - 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

Follow-on work: Adobe Tutorial Builder for Photoshop

- http://labs.adobe.com/technologies/tutorialbuilder/
Excel 2013 (, 2016,...) “Flash Fill”  
S. Gulwani

- Infers iterations over cells based on one or a small number of examples
  - Type and press <enter> to accept suggestions
  - Otherwise press <ESC>
  - Or use ctrl-E to execute


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Apparition W. Lasecki et al., CHI 2015

- Crowd-powered refinement of UI prototype
- Crowd-powered “wizard-of-Oz” animation of prototype in response to designer’s spec

https://www.youtube.com/watch?v=iBCB6P7FWY
**SketchExpress**  S. Lee et al., *UIST* 2017  
*(built on Apparition)*

- Crowd-powered creation, editing, and saving of animated behaviors for UI prototypes by workers
- “Demonstrate–remix–replay” approach
  - Worker can *demonstrate* behavior that is recorded, *remix* it to modify parameters, and *replay* it when needed
  - Recorded behaviors are saved

https://www.youtube.com/watch?v=A_Pngz1mbDs