

# XISketch::

## Designing GUIs by Sketch Drawing and Visual Programming



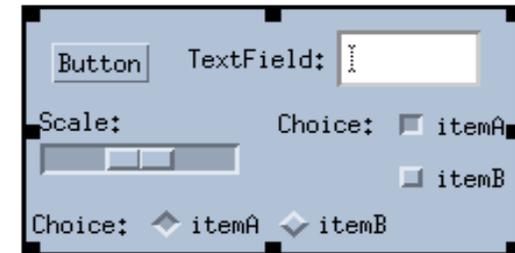
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# GUI Builders

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## Common Approach

- WYSIWYG “Visual Programming”: drag and drop “concrete” objects
- Intuitive but...



## A: Early stages of design

- 1. Precise presentation choices made too early
- 2. Fixed layout ! --- Adaptive layout → Constraints

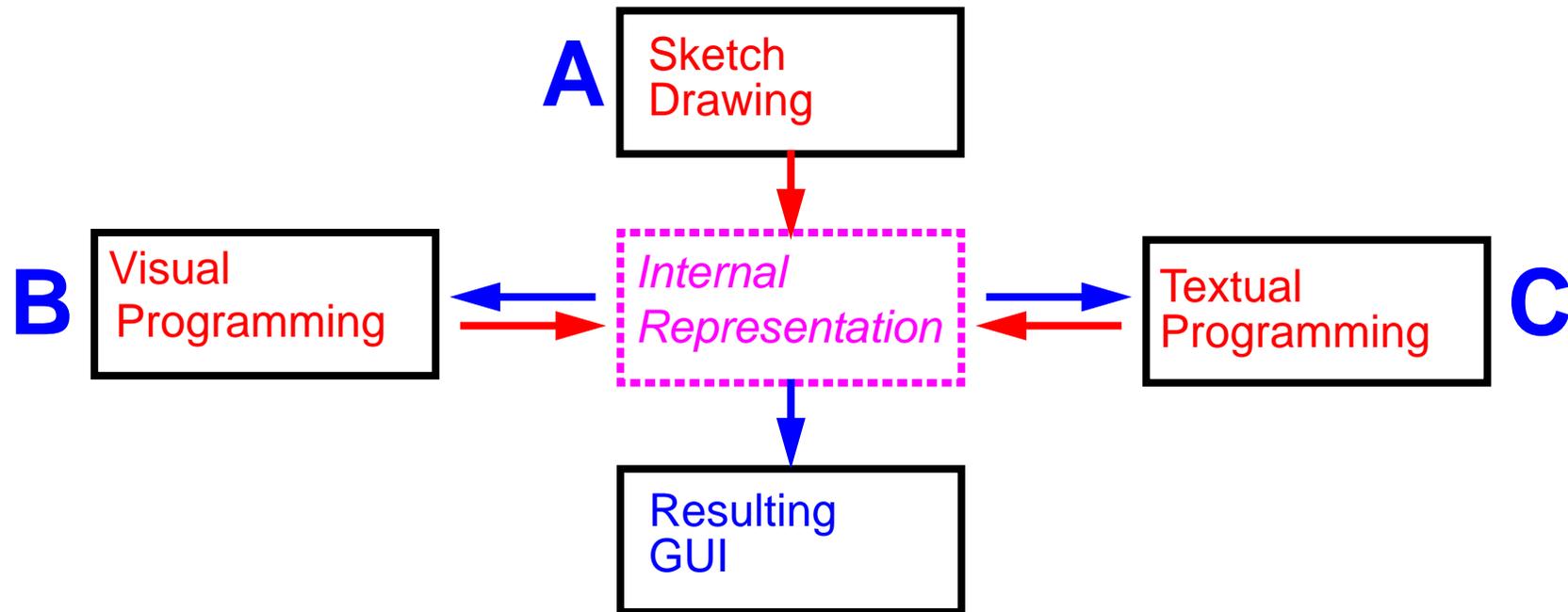
## B: WYSIWYG design

- 3. No intuitive representation for *invisible* “abstract” objects

## C: Advanced Development

- Application-specific, dynamic GUIs → textual programming with a standard P.L.
- 4. But the generated code can't be freely changed !

# Proposed System



*All views are linked together and are dynamically updated*

**Basic Idea:** Different dev. stages → different tasks → different (compatible) tools

**Golden Rule:** Don't break the Iterative Development Loop

# A::Sketch Drawing

## Early Stages of Design

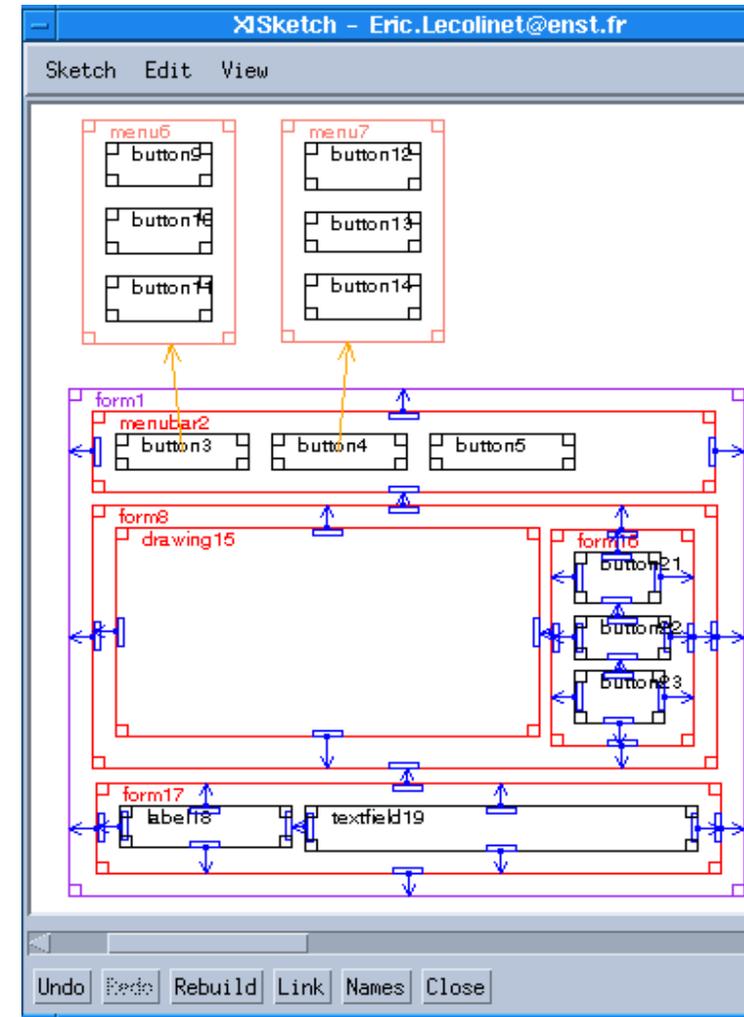
- Rule: Let the user focus on the global design

## Sketch Drawing

- Constrained drawing with the mouse

## Objects Classes and Layout Constraints

- Are automatically deduced by the system
- Can be changed interactively
- Can be changed / refined at a later stage
- Adaptive (constrained) Layout



# B::Visual Programming

## Fully Editable Graph View

- “Concrete” and “abstract” objects represented & handled in a similar way
- Full specification of the GUI in a **Direct Manipulation Style**

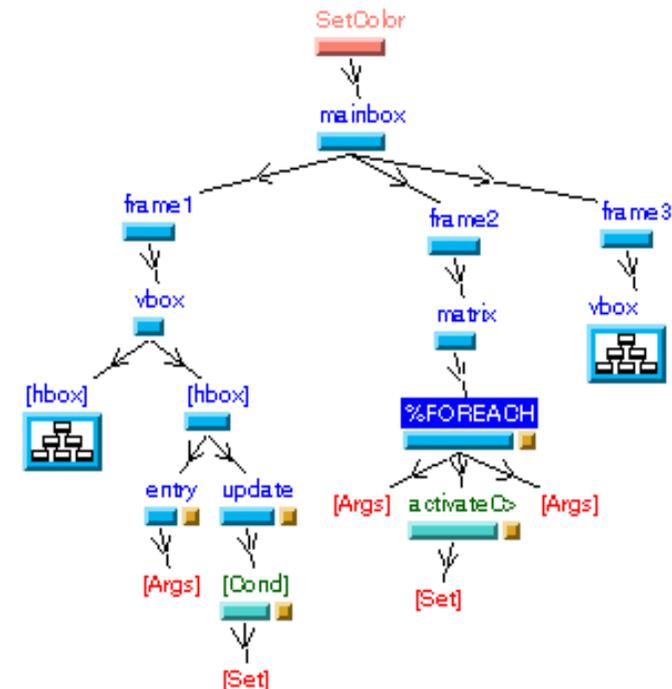
## Iterative Design

- Fully compatible with the Sketch View
- The GUI is modified **incrementally**

## Generic “Contextual” Objects

- Classes modifiable **contextually**

→ The GUI can be deeply **changed / refined** at any stage



# C::Textual Programming

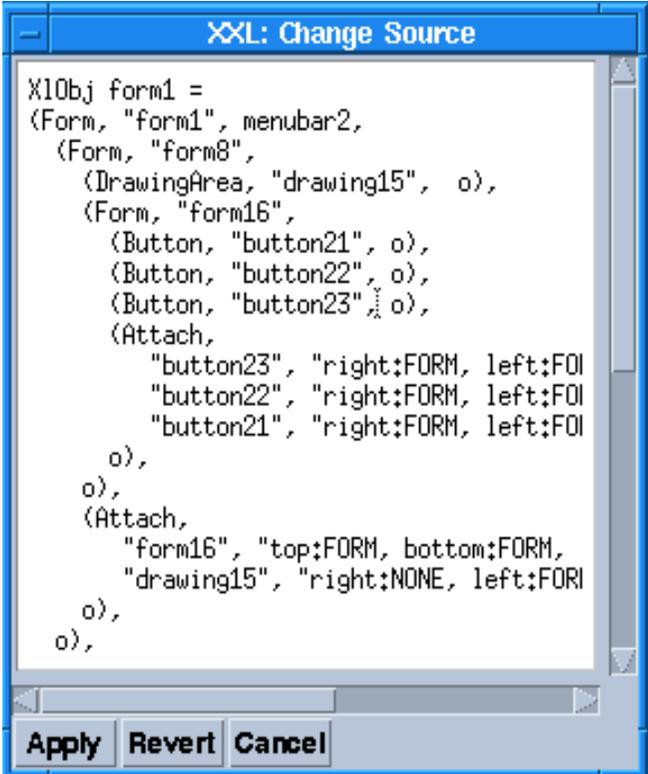
## Textual and Visual Equivalence

The generated C code:

- Is produced incrementally
- Can be freely changed
- While / before / after Visual Programming

→ **Full integration between Visual and Textual Programming**

→ *application-specific code, dynamic GUIs...*



```

X10bj form1 =
  (Form, "form1", menubar2,
   (Form, "form8",
    (DrawingArea, "drawing15", o),
    (Form, "form16",
     (Button, "button21", o),
     (Button, "button22", o),
     (Button, "button23", o),
     (Attach,
      "button23", "right:FORM, left:FOI
      "button22", "right:FORM, left:FOI
      "button21", "right:FORM, left:FOI
     o),
    o),
   (Attach,
    "form16", "top:FORM, bottom:FORM,
    "drawing15", "right:NONE, left:FORI
   o),
  o),

```

## Program Liveliness

- A C program can be modified dynamically **at run-time**

# Conclusion

## Current Status

- Implemented and available
- Based on X Window / Motif

## Availability

<http://www.enst.fr/~elc>

## Future Work

- Object-oriented C++ and ADA API
- Use of another underlying Graphical Toolkit

