Å (Awe) and CandleWeb

Å: A Language for Interactive Animations
CandleWeb: The Å interpreter.

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The CandleWeb project :
http://www.sn.no/~candle/

What is CandleWeb ?

Å, the language :

- Procedural language with C-like syntax.
- Dynamic graphics.
- Interactivity.

CandleWeb, an interpreter for Å :

- Portable and architecture independent.
- Secure.
- Integrated with the Web.
- Freely available(source and binary) for X11.

Programming graphical applications

1. Require experience with a system.
2. Not portable.
3. Time consuming.

Why ?

Å is :

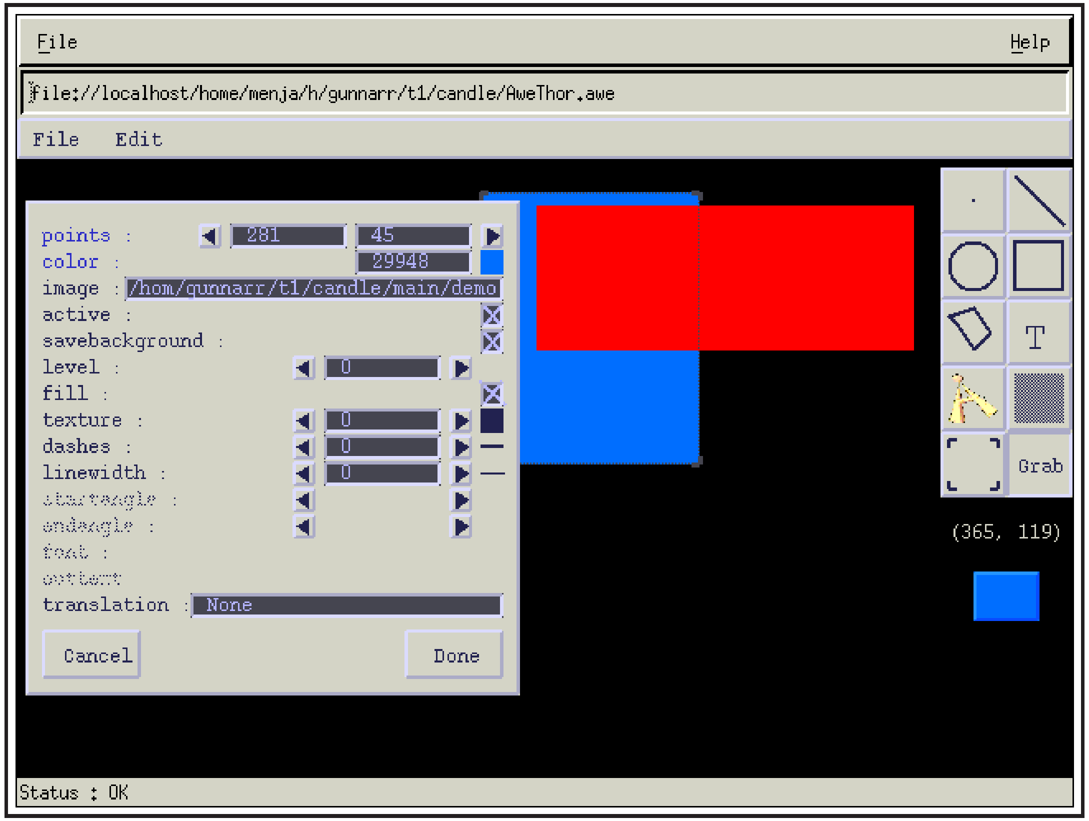
- Simple.
- Powerful.
- Flexible.
- Portable.

Å programming means :

- Reduced development time.
- Easier access to the graphicssystem.
- Shorter programs.
- Fun !

An Å application

This is a screenshot from the prototype of an authoring tool we are developing. The prototype is written in Å.



Authoring Graphical Applications

The scale describes how hard it is to use a given environment for authoring graphical presentations.

- Å emphasises on programming graphics, while Tcl is particularly suited for GUI programming.
- An authoring tool for Å is under development.

The essential difference

The traditional imperative approach :

```
DrawLine(x1, y1, x2, y2);
```

In this approach the programmer has access to a number of primitive imperatives in a graphics library.

The declarative approach used in Å :

```
line points=((x1, y1), (x2, y2));
```

Å has a set of graphical objects corresponding to the most common graphics primitives(point, line, box, polygon, arc, image, text).

Attributes

The objects in Å can be configured by using attributes. Here is a simple example that load, scale and display a picture :

```
main() {
   image points = ((1, 1), (100, 100)),
        image="http://www.sn.no/~candle/cw6.gif";
   output;
}
```

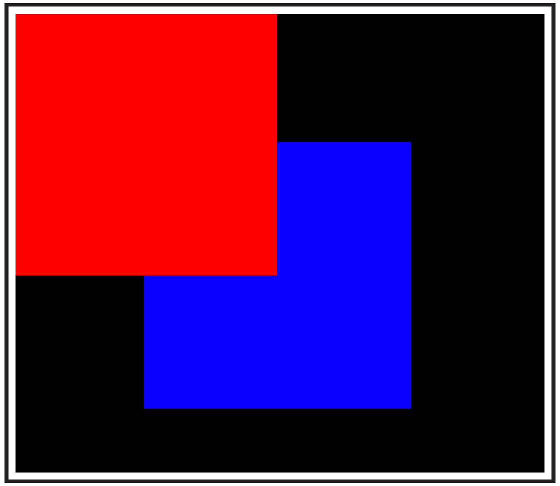
Moving objects – sprites

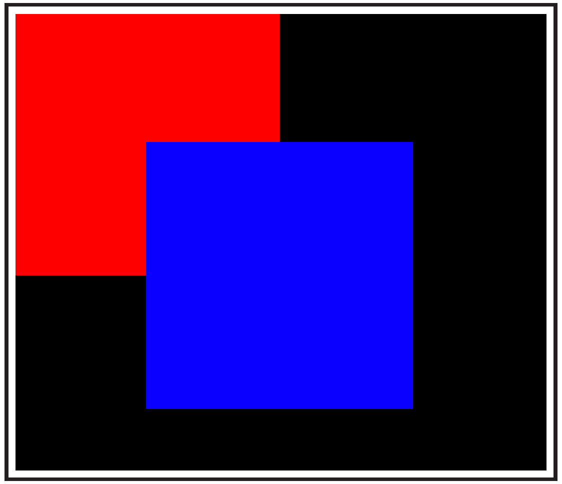
The attributes in Å can be bound to arbitrary expressions. Object changes property dynamically with change in expressions. The following example scrolls a text horisontally :

```
main() {
 int x=640;
 textobj points = ((x, 200)),
   outtext = "Hello World !",
   color = 0x00bebe;
 while(1){
  x = x - 1;
  output;
 }
}
```

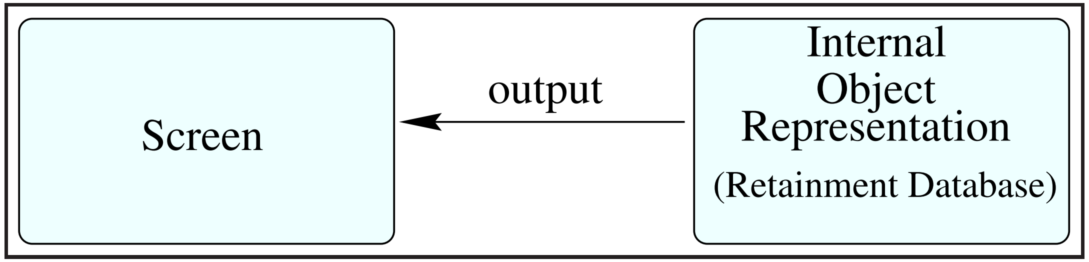
Stacking objects – 2½D

This screenshot uses the level attribute to control the stacking order of two boxes :





The Graphics Model



The output function

- Submits the current object state for drawing. Retention mode.
- Damage repair is done automatically.
- Double buffering. All objects is drawn into an off-screen Pixmap, before it's copied into the visible screen.

Summary

The CandleWeb architecture :

- Higher productivity.
- A larger audience can use it.
- More versatile than traditional authoring systems.
- Real-time graphics performance.
- Courseware, visualization, games etc.
- Available now.

Future Work

- Ports to Windows 3.11/95 and Mac.
- Complete authoring environment.
- Inlining/embedding in HTML-browsers.
- Å compiler for JavaVM.
- Language development.

Want to learn more about Å ?

The Å specification and other documentation :
http://www.ifi.uio.no/~candlweb/doc/

Example Å programs on :
http://www.sn.no/~candle/demos.html

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