Squeak als agile Entwicklungsumgebung

entwickler TAGE 2003

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S&S Software & Support Verlag

Über mich

Name: Marcus Denker

Studiert Informatik in Karlsruhe

Squeaker seit 1998

Projekte:

* Just-In-Time Compiler
* Squeak Deutschland e.V.

Teil I: Das Squeak Projekt

Inhalt:

* Was ist Squeak ?
  -> Beispiele

* Historisches
  -> Alan Kay's Dynabook

* Squeak für Kinder
  -> Beispiele

Was ist Squeak?

1. Multimedia Autorensystem
2. Kinderprogrammiersystem
3. Betriebssystem ?
4. Programmiersprache
5. Entwicklungsumgebung
6. Eine Community

Multimedia

* Text und Bilder

* Präsentationen

* Video

* 3D

Computers, Networks and Education

Globally networked, easy-to-use computers can enhance learning,
but only within an educational environment that
encourages students to question "facts" and seek challenges

by Alan C. Kay

The physicist Murray Gell-Mann has remarked that education in the 20th century is like being taken to the world's greatest restaurant and being fed the menu. He meant that represent- ations of ideas have replaced the ideas themselves; students are taught super- ficially about great discoveries instead of being helped to learn deeply for them- selves.

In the near future, all the representations that human beings have invented will be instantly accessible anywhere in the world on intimate, notebook-size compu- ters. But will we be able to get from the menu to the food? Or will we no longer understand the difference between the two? Worse, will we lose even the ability to read the menu and be satisfied just to recognize that it is one?

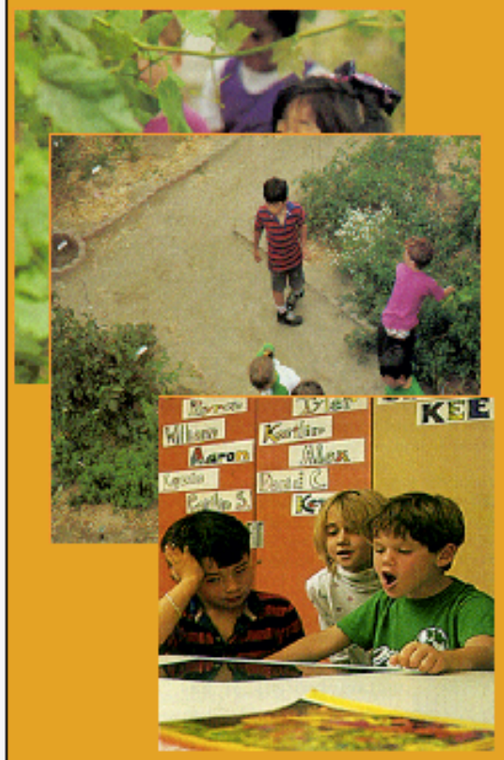
There has always been confusion between carriers and contents. Pianists know that music is not in the piano. It begins inside human beings as special urges to commun- icate feelings. But many children are forced to "take piano" before their musical impulses develop; then they turn away from music for life. The piano at its best can only be an amplifier of existing feelings, bringing forth multiple notes in harmony and polyphony that the unaided voice cannot produce.

The computer is the greatest "piano" ever invented, for it is the master carrier of representations of every kind. Now there is a rush to have people, especially school- children, "take computer." Computers can amplify yearnings in ways even more profound than can musical instruments. But if teachers do not nourish the romance of learning and expressing, any external mandate for a new "literacy" becomes as much a crushing burden as being forced to perform Beethoven's sonatas while having no sense of their beauty. Instant access to the world's information will prob- ably have an effect opposite to what is hoped: students will become numb instead of enlightened.

In addition to the notion that the mere presence of computers will improve learning, several other misconceptions about learning often hinder modern education. Stronger ideas need to replace

STUDENTS at the Open School: Center for Individualization, in Los Angeles, are creating a dynamic simulation of ocean life (right) and doing math (above) with the help of Macintosh computers, which are set unobtrusively into the desks. In the Open School, which already had a strong curriculum before it obtained computers, the machines do not substitute for teachers. There are thought of as "just another material", like books, paints and clay, that can support the children's activities. In the next few years notebook-size

ALAN C. KAY has been a Fellow of Apple Computer Inc. since 1984. Before joining Apple, he was a founder and fellow of the Xerox Palo Alto Research Center and, later, chief scientist of Atari. One of the pioneers of personal computing, he is the original designer of the overlapping-window user interface and Smalltalk, the first completely object-oriented language. Kay has worked with children for most of his career because, he says, "the media that powerfully shape our ways of thinking must be made accessible as early in life as possible." His interests outside of computing include musical performance and instrument design and "trying to learn more about the world



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star

startup

Anfang

Übersicht Vortrag

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fron

frontpage

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ueb

ueber mich

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Sam'sFaceBall

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Programmiersprache

port

portable

Klas

Klassen

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Dynabook

Sque

Squeak fuer Kinder

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Auto

The Big Race

New

New Lunar Lander

NudiBranch3D1

Squeak

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Ver

Verein

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SqueakCD

Stat

Statistik

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Fragen

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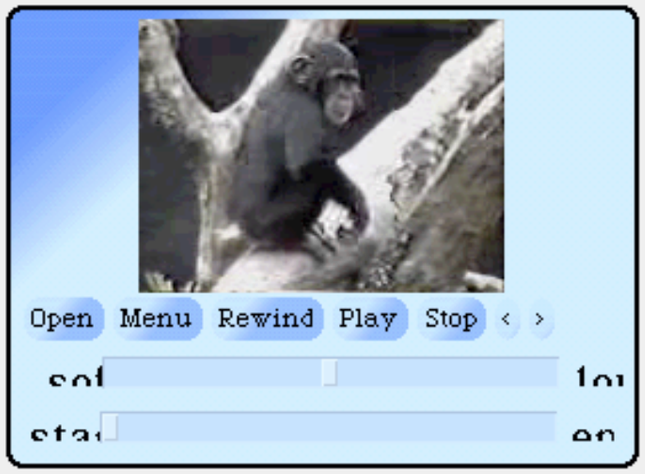
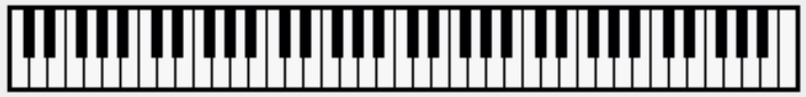
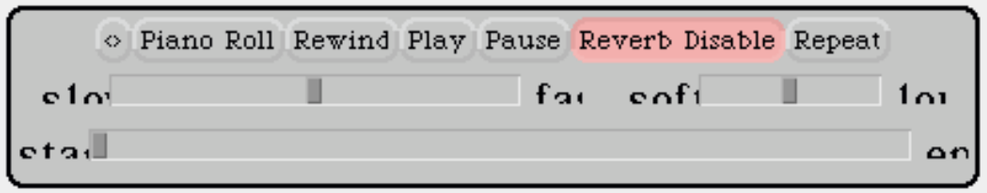
Video und Audio







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Squeak-Alice ReadMe

How do I create new Wonderlands?
This Wonderland was created by evaluating:
    Wonderland new.
This creates a new Wonderland, along with a camera window looking into the Wonderland, a few controls, and a scripting editor.

Speed and Color
Balloon3D can render 3D into 4-, 8-, 16- or 32-bit color. Use the screen manu to try them out. Also, the Wonderland viewing window can be made any size -- use cmd-click to get the yellow morphic resize handle. Larger windows will exhibit a lower frame rate.

How do I add Actors to my Wonderland?
Currently Wonderlands prefer to create Actors from Alice .mdl files. As a service to the community, the Alice team has agreed to make

Undo | Reset | Quit

```
scene
    ground
    light
    camera
    bunny
    bunny
        drum
        head
            glasses
            rightEar
            leftEar
        body
            leftLeg
            leftArm
                mallet
            rightArm
                mallet
            rightLeg
```

Welcome to Squeak-Alice,

an implementation of the Alice 3D authoring tool (http://www.alice.org) in Squeak. With Squeak-Alice you can build interactive 3D worlds, even if you don't know anything about 3D graphics. This little demonstration should give you an idea of what Squeak-Alice can do; read through the comments and follow the directions. Good luck and have fun!"

"Let's start out by moving the bunny. Put the cursor in the line of code below and hit command-D (alt-D for PC users)."

bunny move: forward.

"The bunny moved forward 1 meter. You can also specify how far to move actors. Click the **undo** button to move the bunny back. It is the green button at the upper left. Do this after every action, then evaluate the next line."

bunny move: up distance: 1/2.

"Note that by default everything in Squeak-Alice animates over 1 second. You can change this by specifying a duration for animations."

bunny move: forward distance: 2 duration: 4.

Squeak

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Was ist Squeak?

1. Multimedia Autorensystem
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3. Betriebssystem ?
4. Programmiersprache
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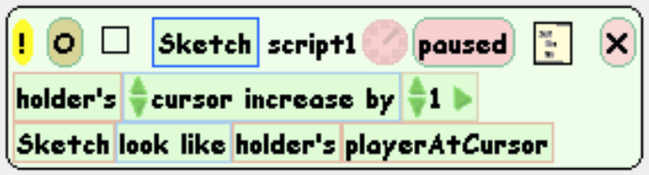
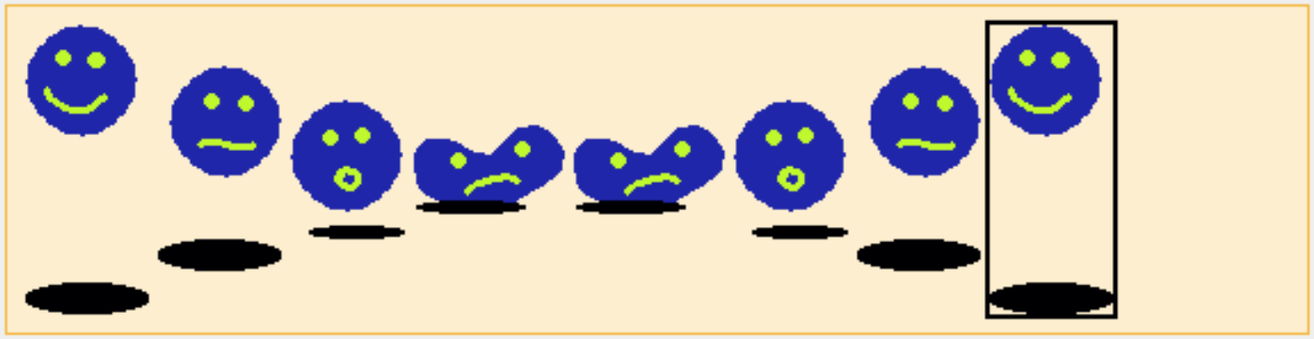
Kinderprogrammierung





Sam L.

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Squeak: Die Programmiersprache

* Vollständig objektorientiert:
  Alles ist ein Objekt
* Virtuelle Maschine, Bytecode
* Garbage Collector
* Grosse Klassenbibliothek
* Beispiel:

100 factorial

Klassenbibliothek

* 2D-Graphics
  - TrueType
  - Flash
  - GIF, PNG, JPEG, PCX, XBM
  - Video: MPEG und MJPEG

* 3D-Graphics
  - 3D-Graphics Subsystem
  - VRML import

* Sound:
  - Recording, Playback
  - ADPCM, AIFF, GSM, MuLaw,
  - MP3 decoding
  - FM-Synthesis
  - MIDI

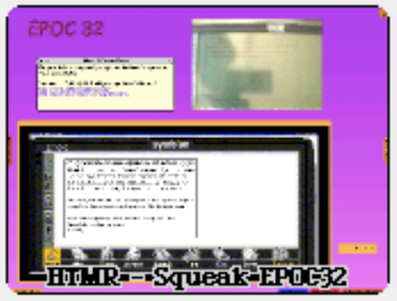
* Networking:
  - HTTP, FTP, POP, SMTP
  - Mailreader, Webserver
  - Groupware-features:
  - Chat (voice, text)

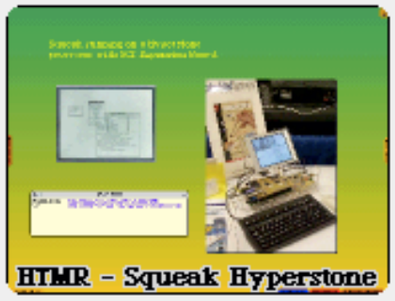
* Misc:
  - Digital Signatures
  - Compression: ZIP, gzip
  - Postscript export

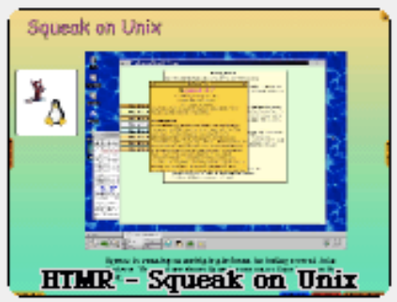
Portabel

- Windows 2000
- Windows NT
- Windows 95
- Windows 98
- Windows CE
- DOS
- Macintosh
- OS/2
- Acorn
- BeOS
- Linux/i386
- Linux/PowerPC
- Linux/Sparc
- SunOS
- Solaris
- SCO System V
- Rhapsody/Next Step
- DigitalUnix/Alpha
- NetBSD/Sparc
- NetBSD/i386
- Psion 5
- Zaurus

- Embedded Squeak
- Netscape Plugin
- IE-Plugin (Squeak as ActiveX Control)
- Multilanguage Squeak
- Bootable Squeak
- Goodies







Autonomous Controller for Microseeker built with Squeak

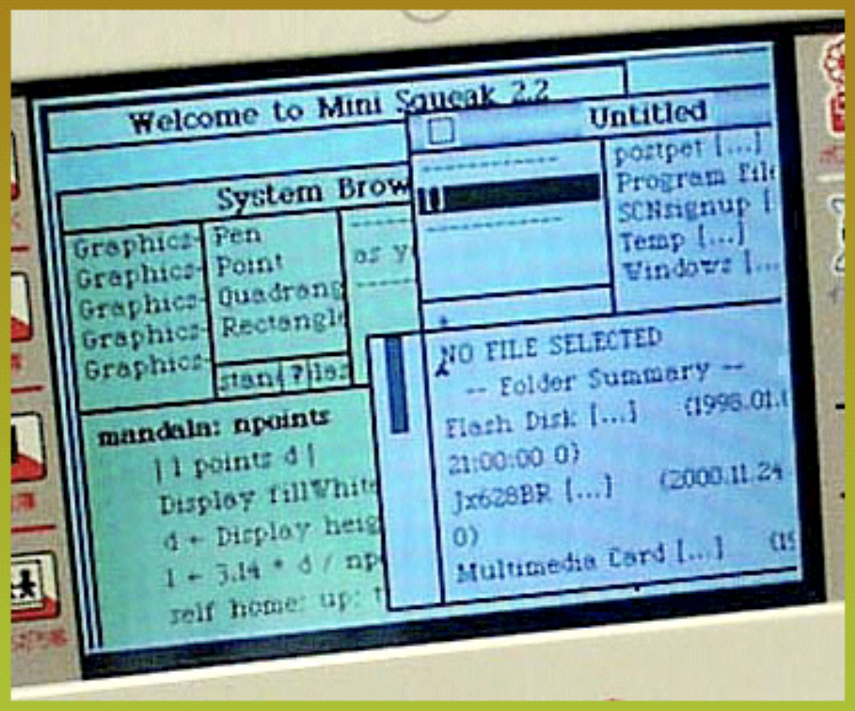
More informations

HUV is a small, privately-owned research & development company that focuses on very small autonomous underwater vehicles (AUVs), and the software that runs them.

HUV is currently involved in the design and construction of MicroSeeker, a simple, small, proof-of-concept AUV. There are two distinct systems in MicroSeeker. The first is the low-level, real-time data acquisition and control system. This is run by a network of PIC microcontrollers that run PIC/Smalltalk. The second is the high-level autonomous control system. That level will be running on a PDA device called a Helio, and it will be written in Squeak.
There is also a simulator written in Squeak.

More Infos: http://www.huv.com/

Squeak for Pocket PostPet (Popope Squeak)



More infos

Squeak Swiki: http://minnow.cc.gatech.edu/squeak/1685

Squeak

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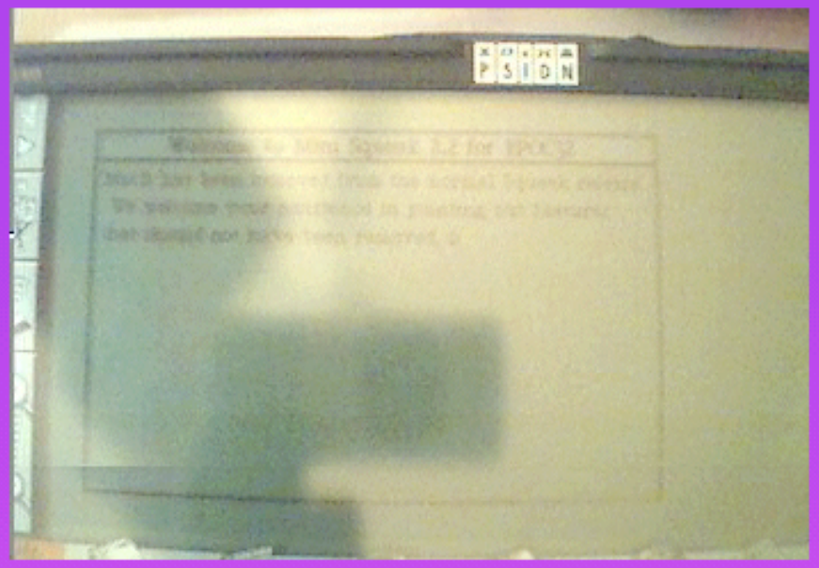
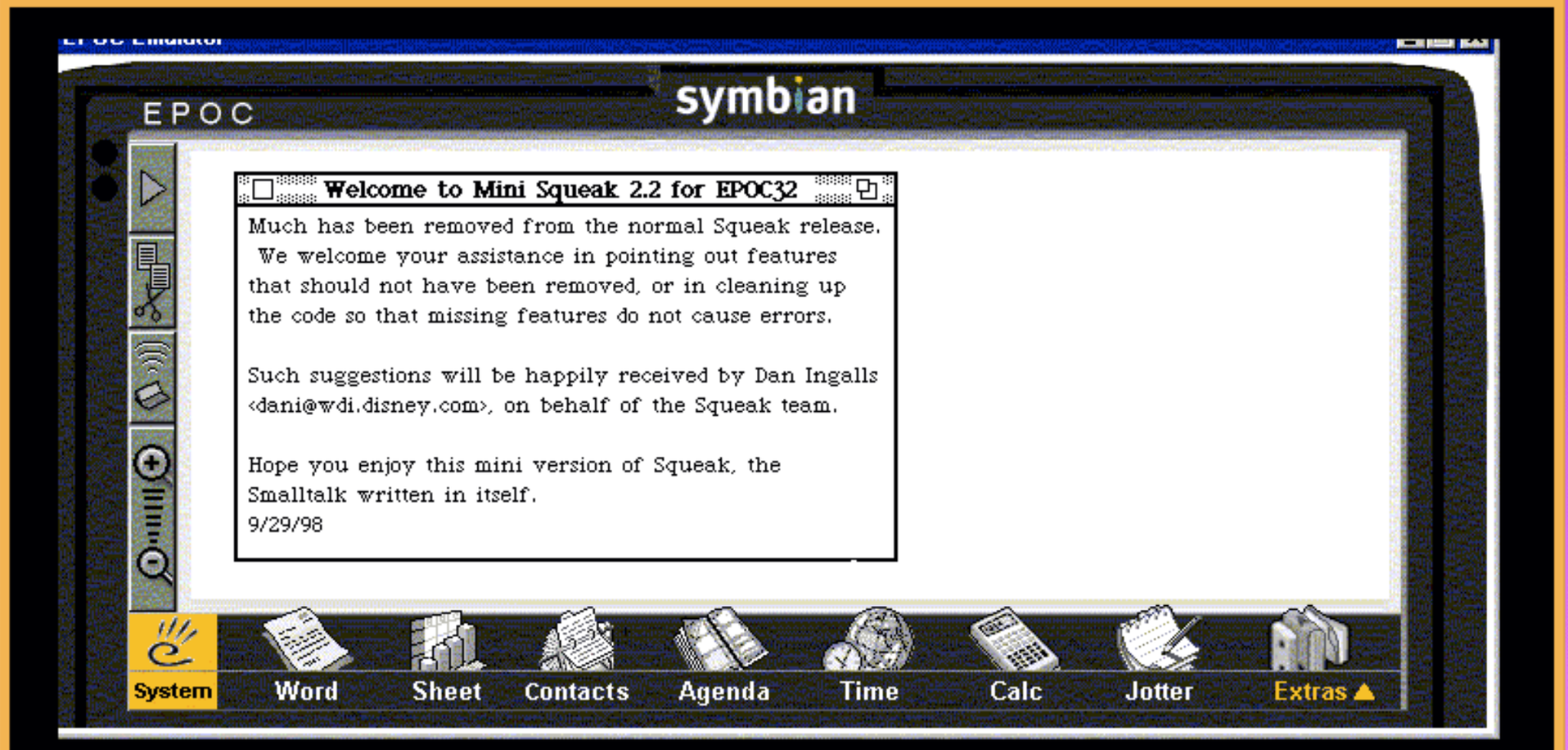
EPOC 32

More informations

The port is in a very early stage (no keyboard no pointer, very slow BitBlit).

Contact: Pablo J. E. Rodriguez (pablo@rodablo.com)
http://www.rodablo.com/squeak/
http://minnow.cc.gatech.edu/squeak/1895





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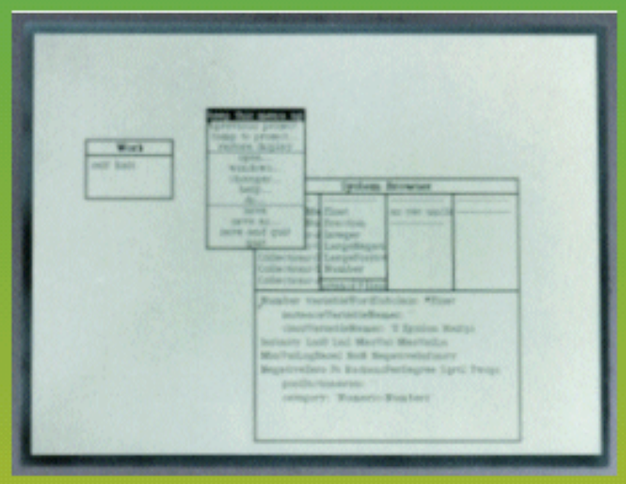
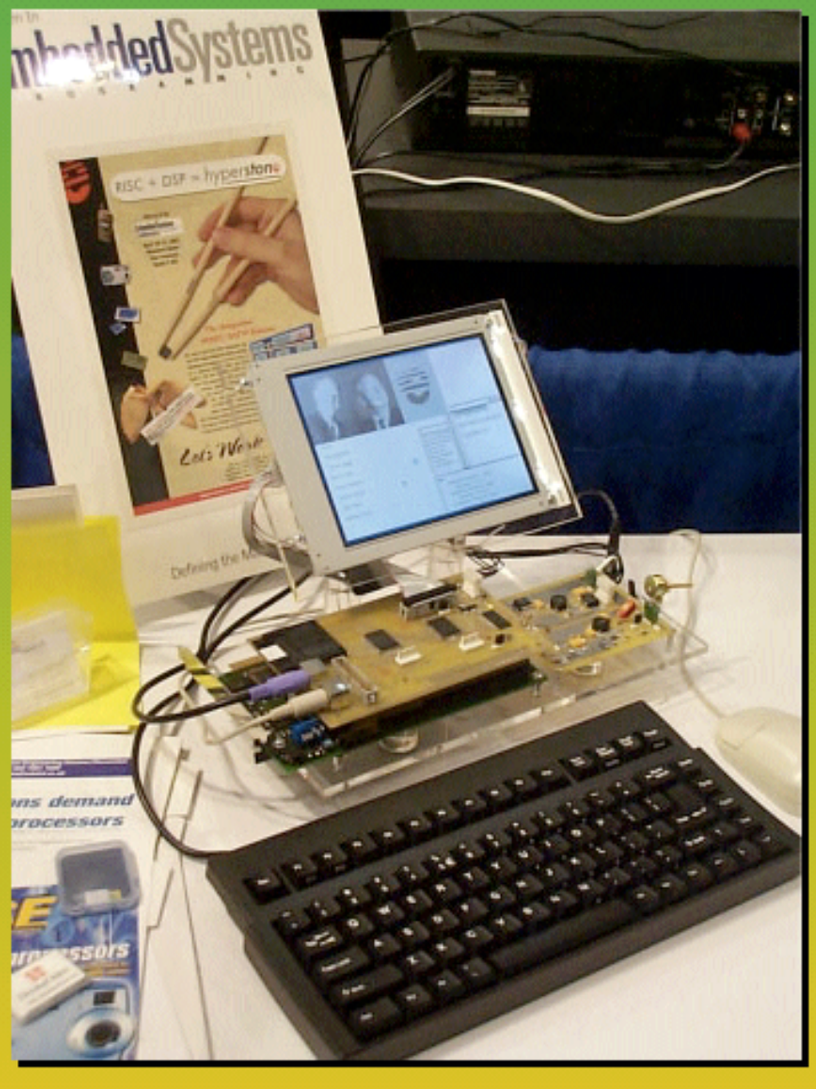
Squeak running on a Hyperstone processor with SCT Expansion Board.





More Infos

Squeak Swiki:	http://minnow.cc.gatech.edu/squeak/1836
STC:	http://www.softcomp.com/pages/phoenix/details.htm

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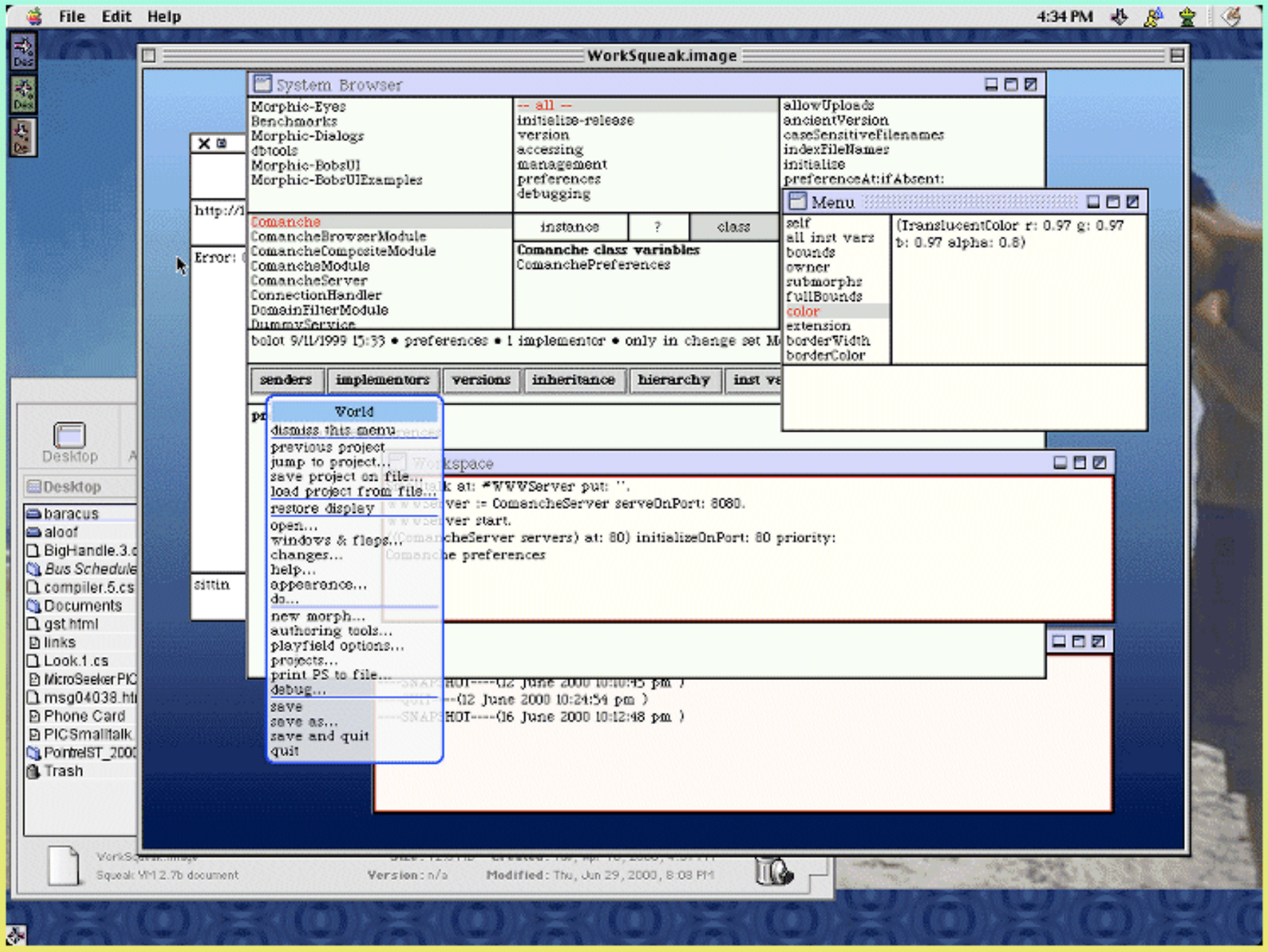
Mac OS 9



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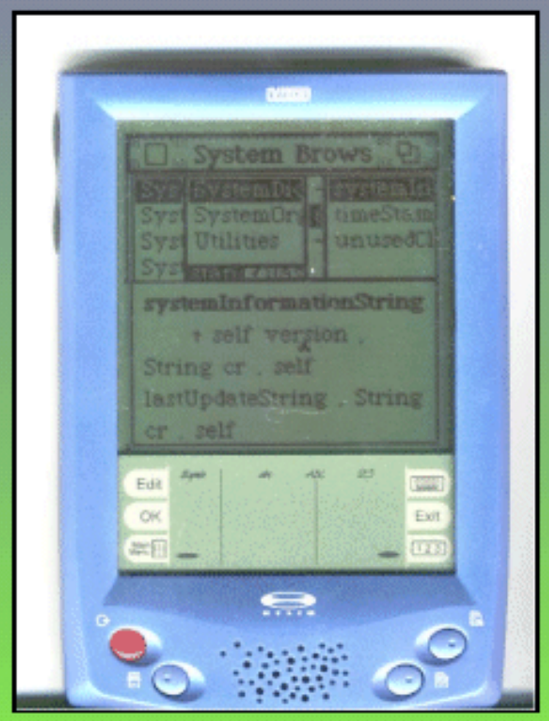
Squeak on VTech Helio

There is also a Squeak port to VTech helio devices.



More infos

Squeak Swiki:	http://minnow.cc.gatech.edu/squeak/1708
Helio Start Page:	http://pocket1.cjb.net
Squeak on Helio:	http://www.huv.com/uSeeker/smalltalk/helio.html

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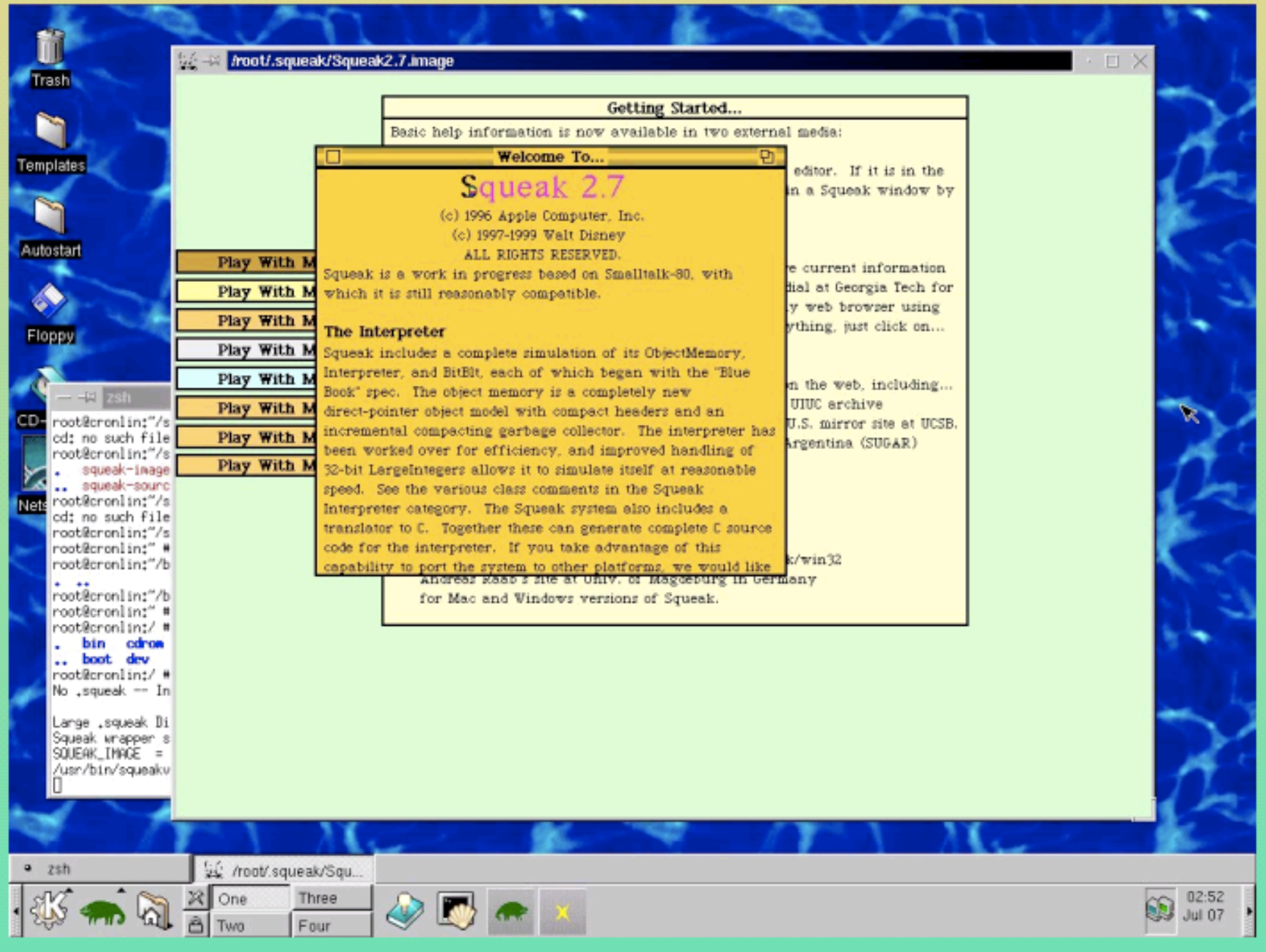
Squeak on Unix



Squeak is running on multiple platforms including several Unix Systems. This picture shows Squeak running on Suse Linux with KDE.

Squeak on Windows

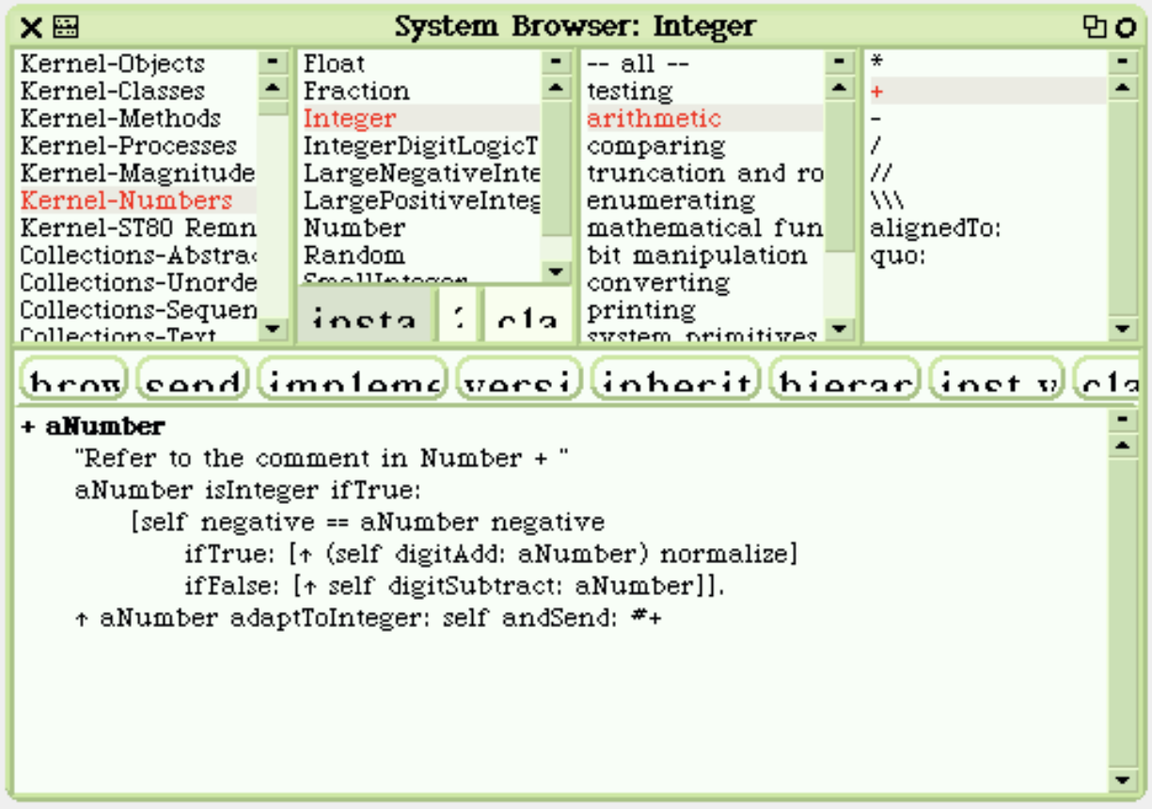
Squeak is running on multiple platforms including all windows platforms (Win98, Win95, WinNT, WindowsCE, Windows 2000, ...)

Was ist Squeak?

1. Multimedia Autorensystem
2. Kinderprogrammiersystem
3. Betriebssystem ?
4. Programmiersprache
5. Entwicklungsumgebung
6. Eine Community

Entwicklungsumgebung

* Der KlassenBrowser:



* Inspektor:

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Die Squeak Community

* Entwickler:
    - Mailingliste (ca. 1000 Mitglieder)
    - SqueakNic
* Lehrer und Interessiert:
    - Squeakland.org und Mailingliste
* Deutschland:
    - Squeak Verein

Historisches

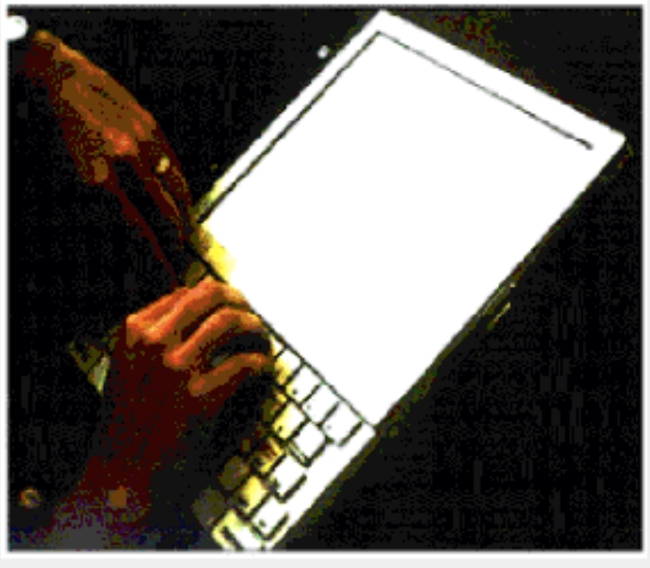
* Alan Kay 1968: Das Dynabook
"A Dynamic Medium for Creative Thought"

* Xerox PARC 1970 - 1980
  - GUI
  - Smalltalk

* Squeak seit 1996
  (Apple, Disney, jetzt HP)

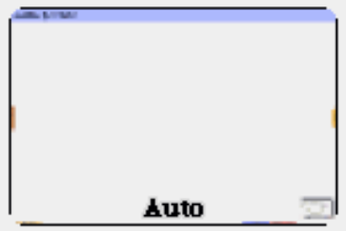
Das Dynabook

Alan Kay: "Ideaprocessor Vs. Wordprocessor"



Squeak für Kinder

* Einfache graphische Skriptsprache: eToys



* Beispiel 1: Auto fahren

* Beispiel 2: Lunar Lander

* Beispiel 3: Unterwasserwelt

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Auto fahren

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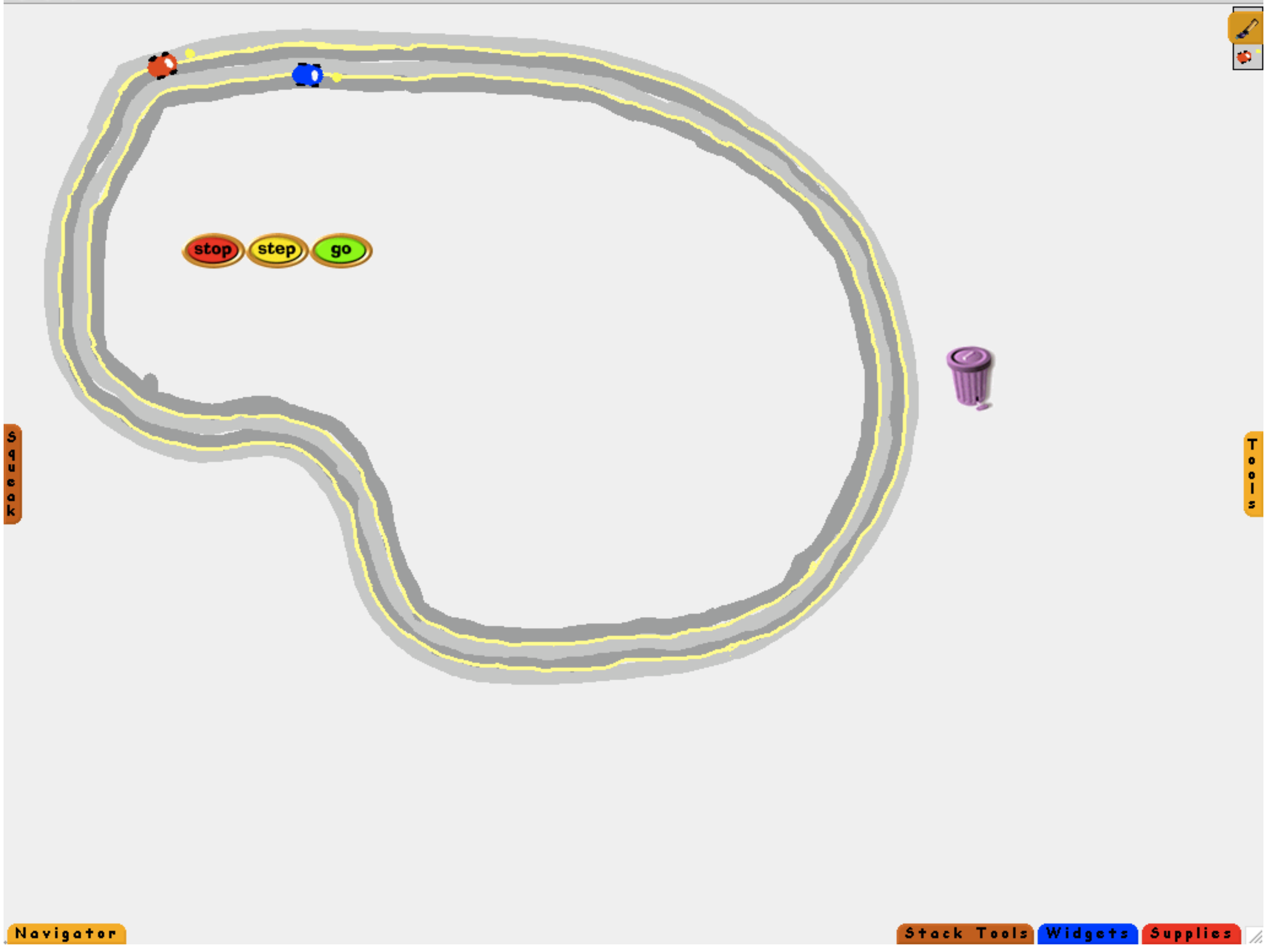
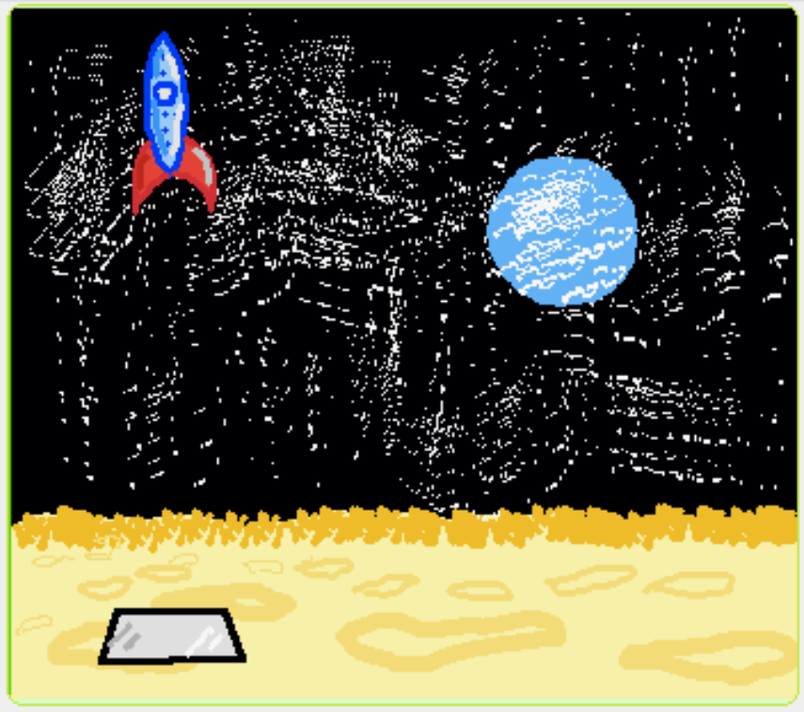


Your Own Lunar Lander Game



ship gravity paused
ship's ySpeed increase by -0.7
ship's y increase by ship's ySpeed

ship motor paused
ship's ySpeed increase by Joystick2's pDown

flame on paused
To Joystick2's pDown > 0.0
flame's x ← ship's x
Vc flame's y ← ship's y
flame show
N flame hide

ship land paused
To ship's color sees color
To ship's ySpeed > -8
Vc flame hide
ship hide
Vc N ship make sound splash
crash show
ship allProcessespause
N

ship allProcessespause normal
ship pause script gravity
ship pause script motor
ship pause script land
flame pause script on

stop step go
ship reset

ship's ySpeed =

ship reset normal
ship's x ← 70.0
ship's y ← 260
ship's ySpeed ← 0
ship show
flame hide
crash hide

ship reveal normal
crash show
flame show

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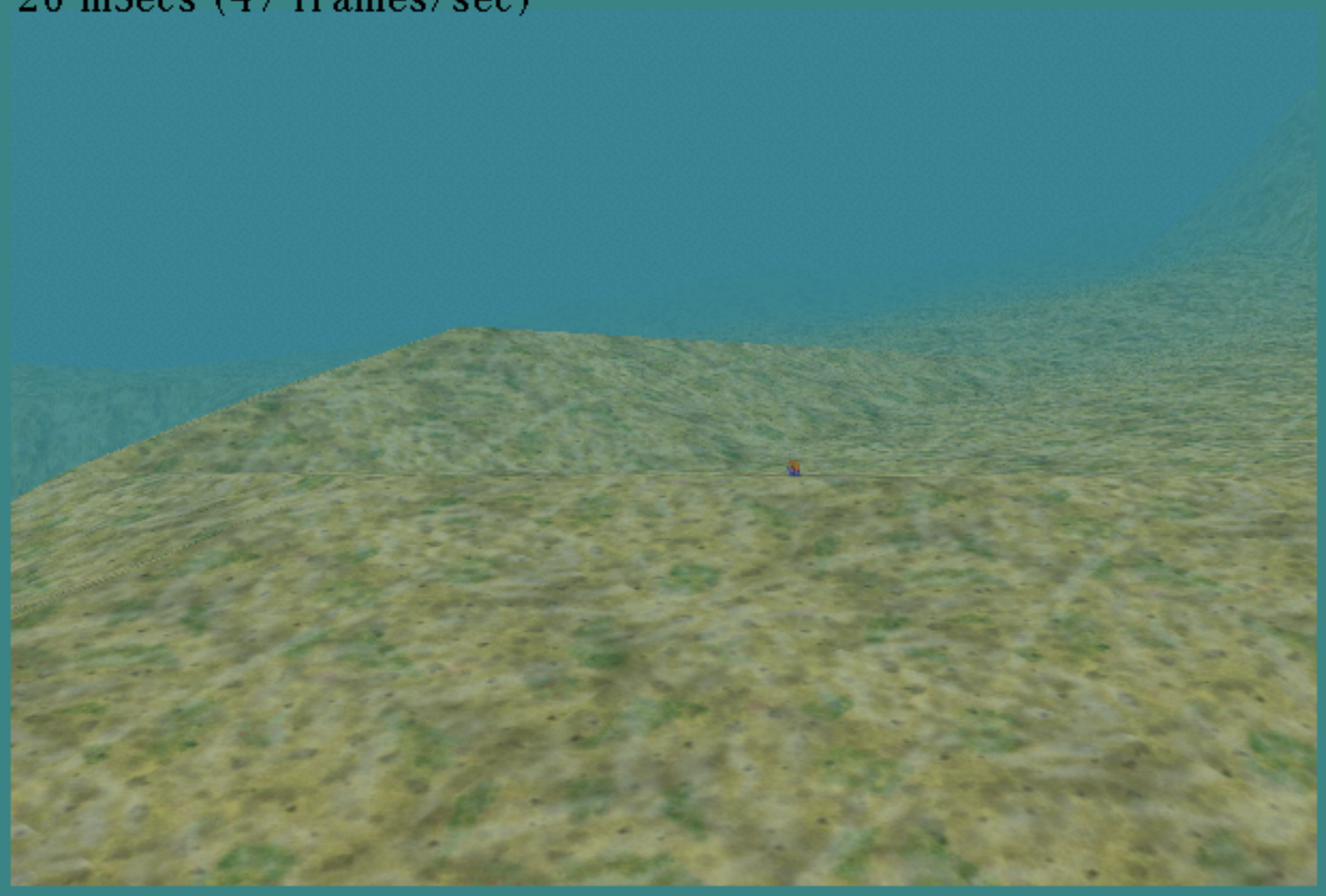
20 mSecs (47 frames/sec)



The two dots on top represent variables used in the fish animation scripts

Here is the viewer for the nudi branch (note: the updating thumbnails are expensive so make sure you don't have too many)

go stop

These buttons control the update cycle and should always be 'on'.

To see the fish animations you have to open a viewer on the 'camera' to the left and look at one of the animateFishXYZ scripts.

stop step go NAVIGATION: Click and drag in the 3D world or use cursor keys

Here are the controls for all eToy scripts

```
! O ☐ camera moveNudi ticking ✕
Nudi4 forwardBy: Joystick5's upDown / 5
Nudi4 turnBy: Joystick5's leftRight / 3
```

The joystick controls the nudi branch's motion using this script.

The flap on the right contains the fish textures

```
! O ☐ camera animateWaves ticking ✕
Floor4's graphic ← WaveHolder4's graphicAtCursor
WaveHolder4's cursor increase by 1
```

The script to our left controls the wave animation; the holder containing the waves can be seen in the flap to the right.

This script controls the animation cycle of the nudi branch itself [note: the NudiBranch model has animations for head and body separately]

```
! O ☐ camera animateNudiBranch ticking ✕
Head4's animationIndex increase by 1
body's animationIndex increase by 1
```

```
! O ☐ camera animateShark ticking ✕
Shark4 forwardBy: 10
Shark4 turnBy: 0.5
Shark4's animationIndex increase by 5
```

This is the shark animation

The Wonderland scripting area is hidden right here.

Texture Wnld

Navigator Widgets Supplies

Teil II: Inhalt

* Grundlagen
    - Smalltalk in 2 Minuten
    - Demo: Browser

* Seaside
    - Überblick
    - Demo: Counter

Smalltalk in 2 Minuten

* Reservierte Wörter: Pseudovariablen

  self super thisContext true false nil

* Literale: 1 1.1 'String' #('ein' 'array') #symbol

* Blöcke: [:param | code] [1]

* Zuweisung: a := 1

* Für Methoden: | lokale Variablen |
  ^ Ergebnis

* Methodenaufrufe: 3 raisedTo: 4

Beispiele

```
(1 < 2) ifTrue: ['wahr'] ifFalse: ['falsch'].

#( 1 2 3 4) + 3

#(1 2 3.2 4) select: [:each | each > 2].

#(1 2 3 4) collect: [:each | each class].

#(1 1.1 'hallo') do: [:each  | each class browse].

#(1 2 3 4 5 6) inject: 0
                    into: [:sum : each | sum + each].
```


Browser Demo

System Browser: Integer

Kernel-Objects	Float	-- all --	*
Kernel-Classes	Fraction	testing	+
Kernel-Methods	Integer	arithmetic	-
Kernel-Processes	IntegerDigitLogicTes	comparing	/
Kernel-Magnitudes	LargeNegativeIntege	truncation and round	//
Kernel-Numbers	LargePositiveInteger	enumerating	\\\
Kernel-ST80 Remnan	Number	mathematical functic	alignedTo:
Collections-Abstrac	Random	bit manipulation	quo:
Collections-Unorder	instance ? class	converting	

browse | senders | implementors | versions | inheritance | hierarchy | inst vars | class vars | sou

```
+ aNumber
    "Refer to the comment in Number + "
    aNumber isInteger ifTrue:
        [self negative == aNumber negative
            ifTrue: [^ (self digitAdd: aNumber) normalize]
            ifFalse: [^ self digitSubtract: aNumber]].
    ^ aNumber adaptToInteger: self andSend: #+
```

Seaside: Überblick

* Grundlegende Informationen
* Eigenschaften von Seaside
* Demo: Counter
* Sessions und Components
* Interaktionen zwischen Komponenten:
  #call und #answer

Seaside: Squeak Enterprise Aubergines Server

* Entwickler: Avi Bryant, Julien Fitzell
  Beta4 Productions (beta4.com)

* Buchungssystem Whistler.com

* Ursprünglich für Ruby: "IOWA"

* Link: http://www.beta4.com/seaside2

* Version 2 "Borges"
  - komplette Neuimplementierung.
  - noch nicht ganz vollständig

Seaside: Eigenschaften

* Session Management:
  - User Session ist ein Block zugeordnet
  - Controll-Flow wie in GUI-Applikation
* Callback basiertes Eventmodell
* HTML Generierung mittels Smalltalk-Klasse oder Template System
* Wiederverwendbare UI-Komponenten
* Optional: Entwicklertools im Web-Brauser
* Verwendet Squeak Webserver "Comanche"

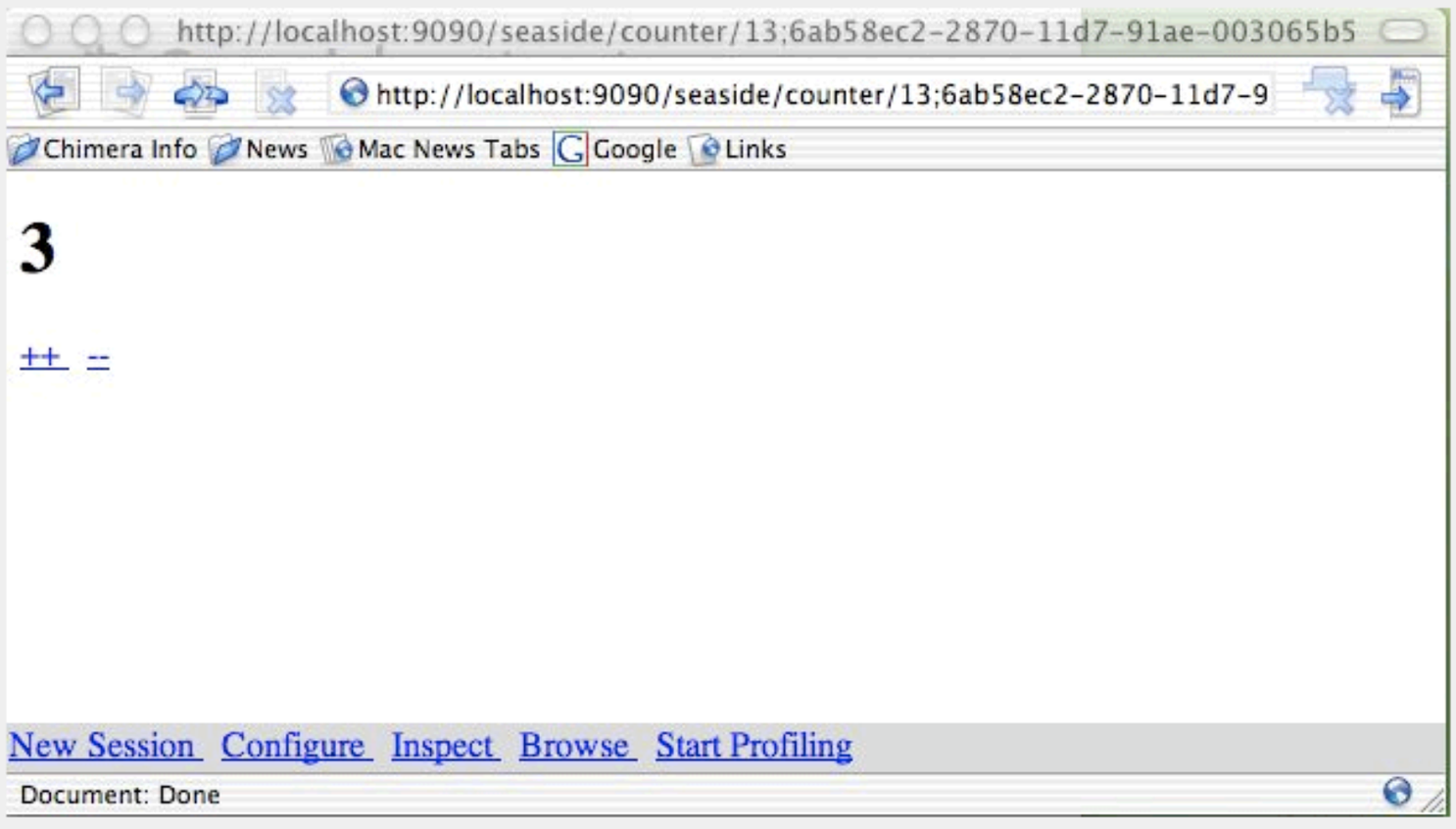
Counter Demo

* Seaside starten:

WAKom startOn: 9090

full screen off

* http://localhost:9090/seaside/counter



Seaside: Sessions

* In URL codiert http://localhost:9090/seaside/counter/2;730aba8c-286d-11d7-91ae-003065b55c16

* Jeder Session ist Block zugeordnet:

* alle Daten werden von Seaside in einem Cache vorgehalten (LRU)

Seaside: Components

* Zustand: ("count")

* Aktion: #increment, #decrement

* Display: #renderContentsOn:

* Response Loop:

  - WACounter erzeugen. Initialisierung.
  - #renderContentsOn:
  - warten auf Eingabe
  - User Eingabe: Callback ruft #increment auf
  - #renderContentsOn:

* Komponeten können geschachtelt werden

Seaside: #call und #answer

* Neue Komponente aufrufen mit #call:

* Resultat zurück: #answer:

* Beispiel 1: #call:

```
decrement
  count = 0
    ifFalse: [count := count - 1]
    ifTrue: [self call: (WADialog new message: 'Ups!')]
```

* Beispiel2: #inform:

```
decrement
  count = 0
    ifFalse: [count := count - 1]
    ifTrue: [self inform: 'Ups!']
```


Teil III: Überblick

* Neu: Version 3.4

* Die Zukunft: OpenCroquet

* Der Squeak Verein

* Statistik

* Fragen?

Version 3.4

* 3.4

  - Modularisierung

  - Squeak Kern + SqueakMap Archive

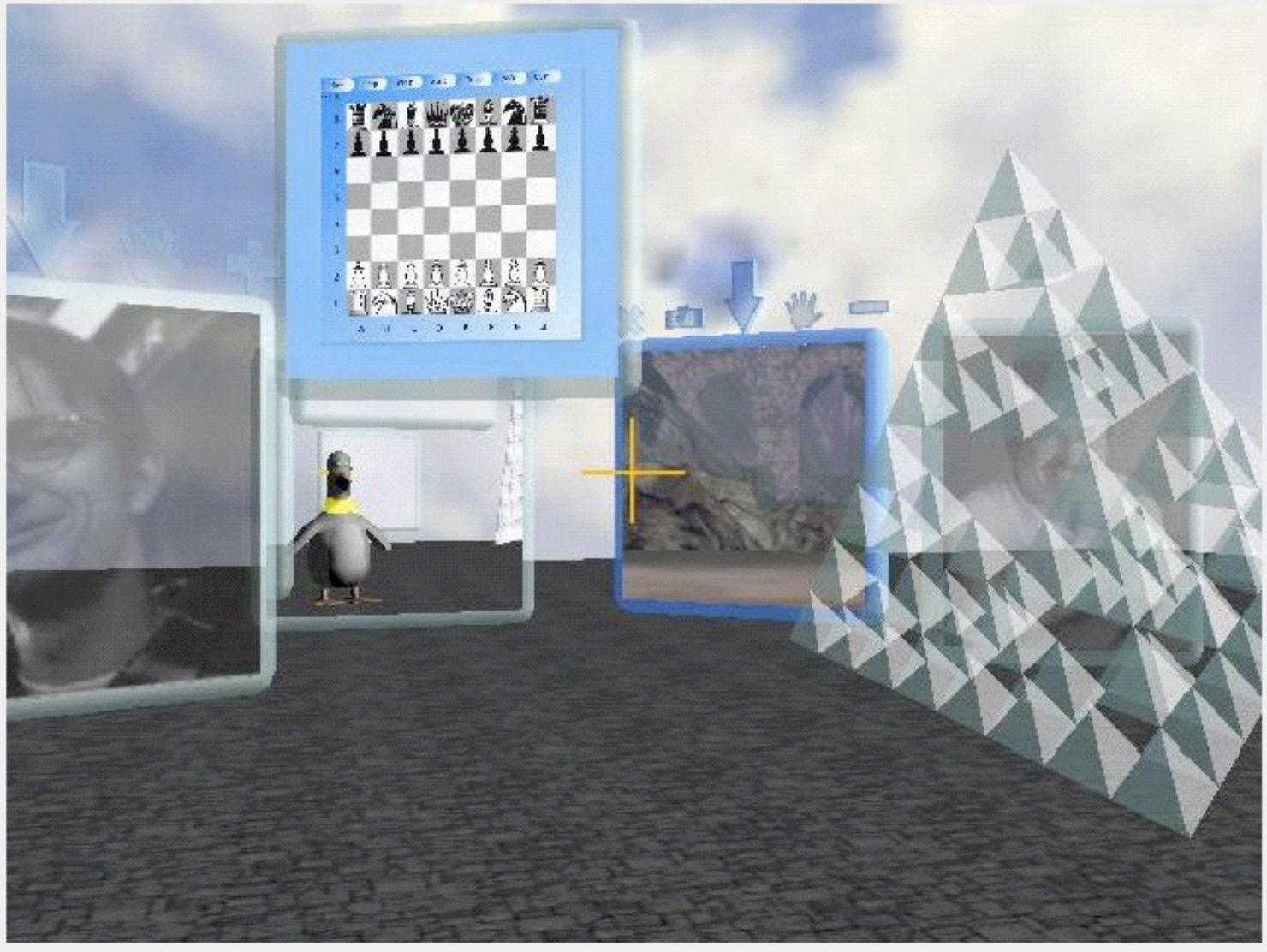
* Weiter:

  - Squeak Just-In-Time VM

  - VI4: neue Version 4

Croquet: Squeak in 3D

* Peer2Peer Virtual Reality System
* leider: nur Bild



Der Verein

* Gründung LinuxTag 2002
* Noch in Gründungsphase:
  - als gemeinnützig anerkannt
  - Eintragung bald
* Mitglieder gesucht!
  - Siehe http://squeak.de

Die Squeak CD-ROM

* Squeak für alle Systeme
  - Version 3.2 + 3.4b
* OpenCroquet 0.1 preAlpha
* Dokumentation und Tutorials

* http://squeak.de
  - CD-Image kostenlos
  - gebrannte CD ab 10 EUR

Statistik

* Anzahl Klassen:

```
Smalltalk allClasses size
```

* Anzahl Methoden:

```
CompiledMethod allInstances size
```

* Anzahl Objekte:

```
Smalltalk allClasses inject: 0 into:
    [:sum :each | each allInstances size + sum]
```

672255

* Speicher: vm statistics

* LinesOfCode:

```
Smalltalk allClasses inject: 0 into: [:sum :each | each linesOfCode + each
class linesOfCode + sum]
```

370240

Das wars!

FRAGEN ?