



Mixing Worlds

Wolfgang Bumiller (0725517)

Peter Frühwirt (0725673)

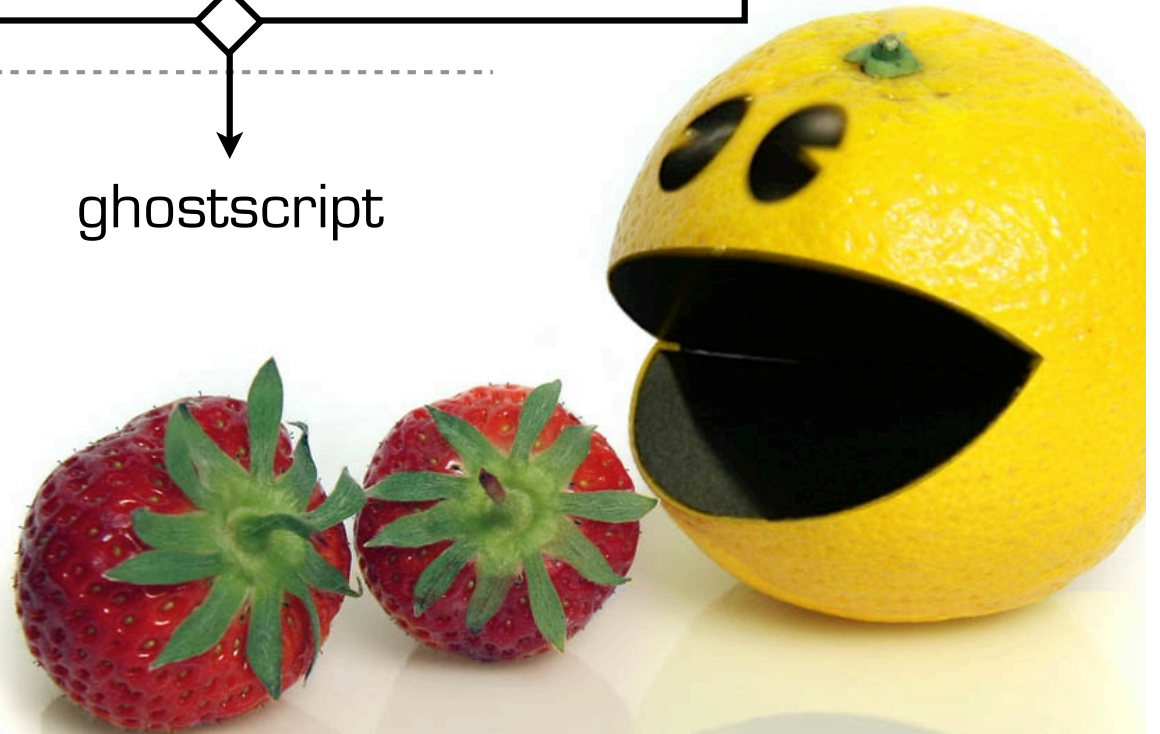
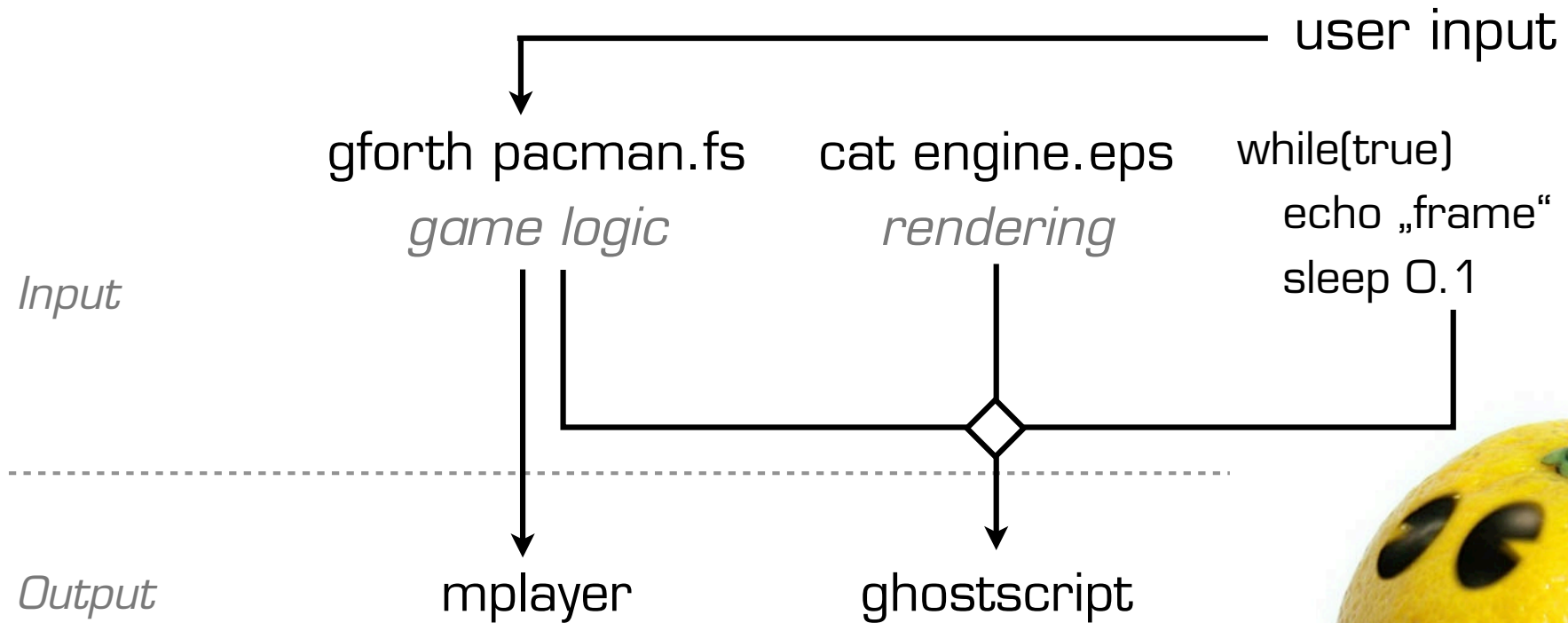
Martin Perner (0725782)

Architecture

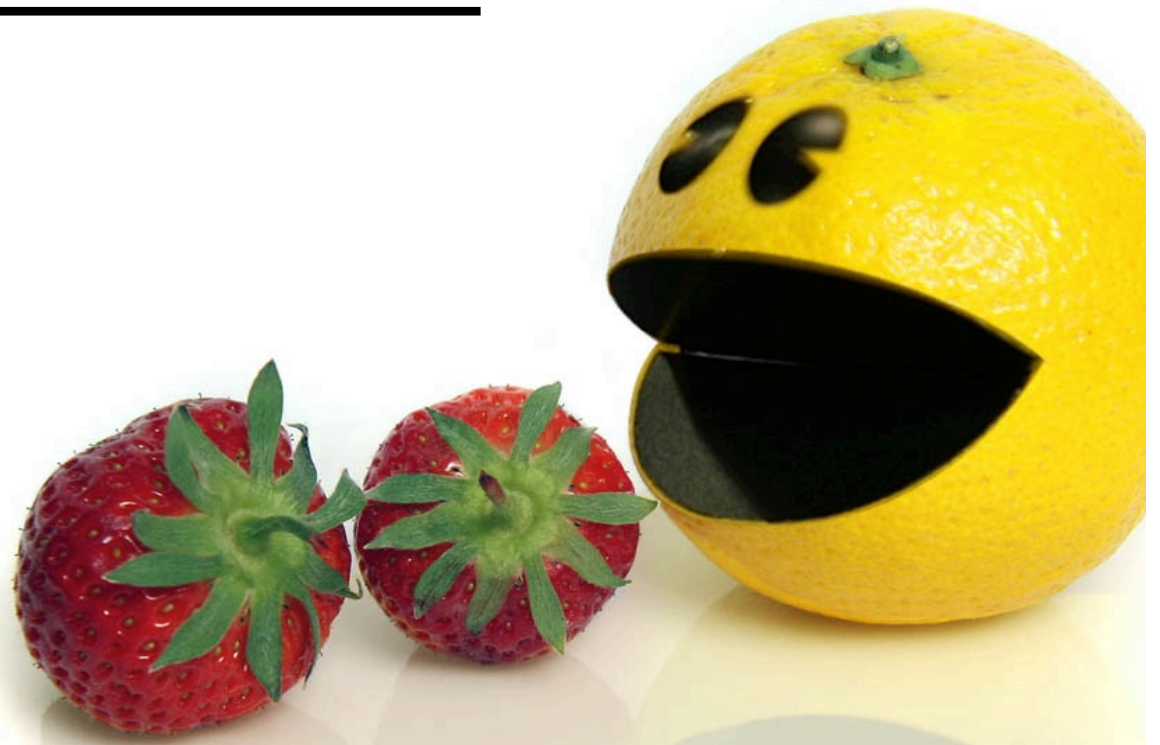
- Postscript 3D rendering engine
- Logic over Forth
- Interprocesscommunication using FIFO
- Distributed system
- Simple artificial intelligence agent
- Integrated sound (mplayer connection)



Architecture



Livedemo



Language highlights

- Execution tokens (Game logic, Forth)
- Runtime Code Generation (Rendering engine, Postscript)
- Dynamic scoping (Rendering engine, Postscript)
- Document structuring



Language highlights

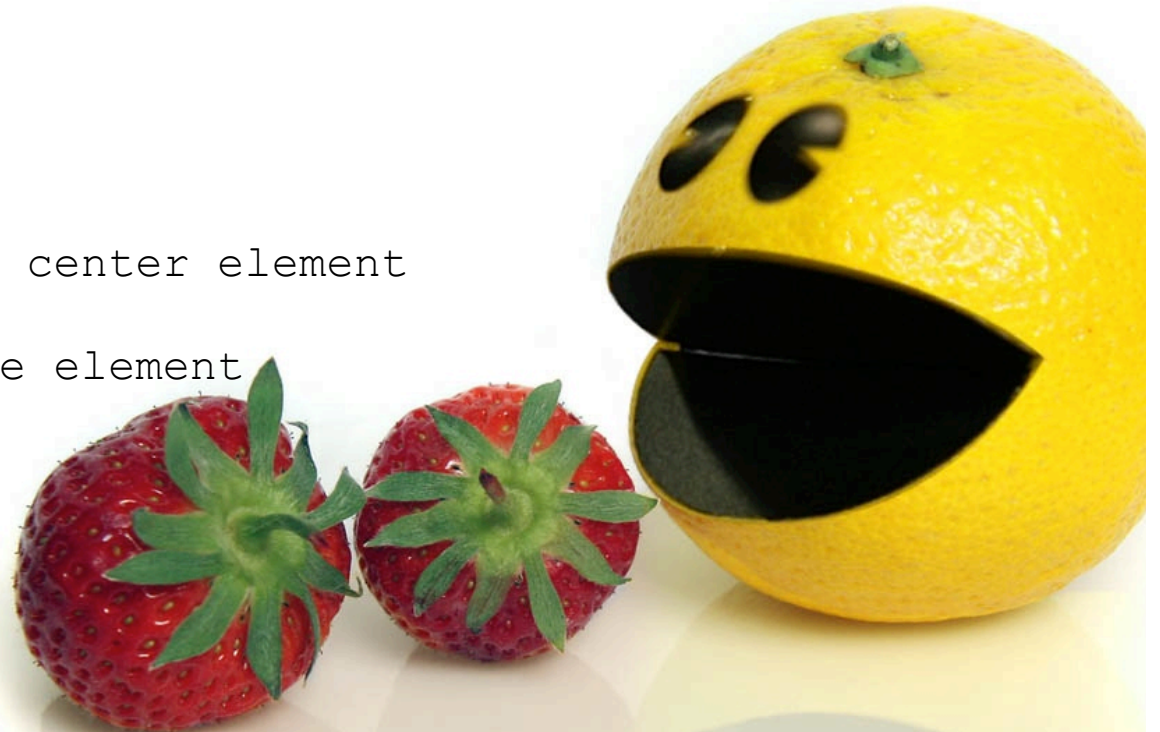
Execution Tokens (Forth)

```
: set-op-p \ save operation
  ['] + opxt !
;

: set-op-m \ save operation
  ['] - opxt !
;

: exec-op \ executes operation
  opxt @ execute
;

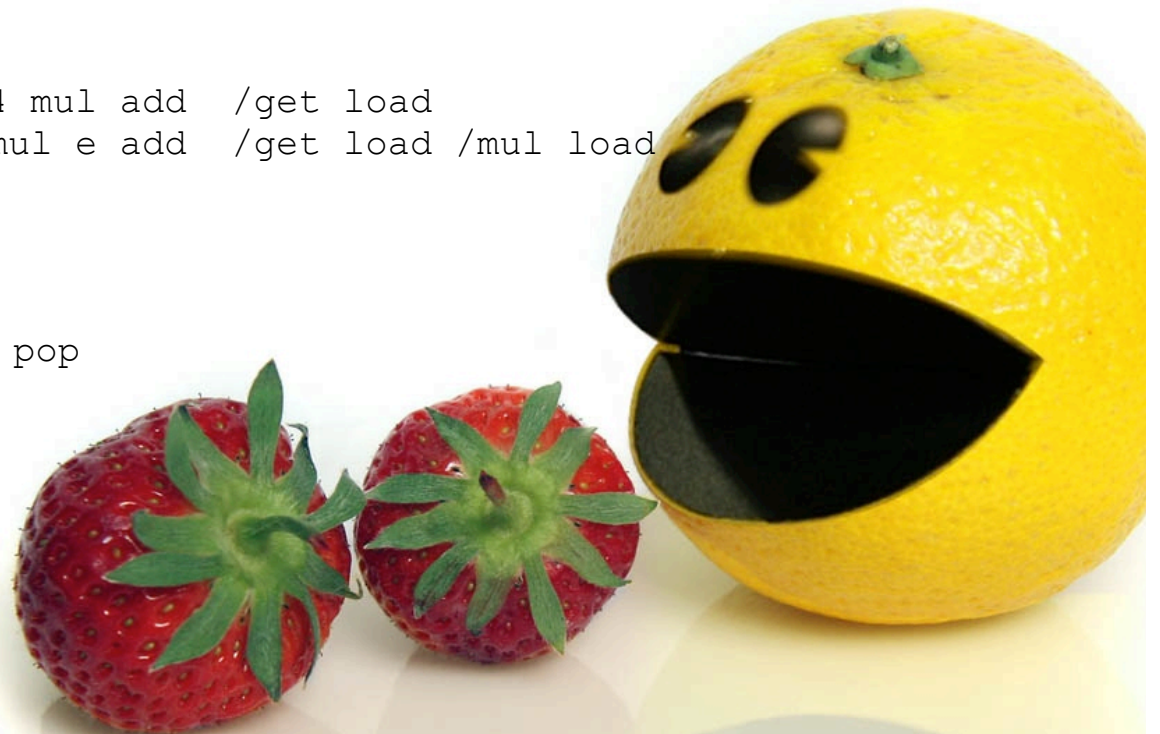
: move ( n1 n2 flag -- n3 n4 )
  if
    getField 10 * ( n1 n4 ) \ center element
    swap
    2 exec-op ( n4 n3 ) \ move element
    swap
  endif
;
```



Language highlights

Runtime Code Generation (Postscript)

```
/mat*mat-gen % matrix1 matrix2 -- matrix
{
  /mat*mat
  4 dict begin
  [
    { 4 dict begin m2 exch def m1 exch def } aload pop
    %/3add { add add add } /def load
    0 1 3 {
      /i exch def
      0 1 3 {
        /j exch def
        0 1 3 {
          /e exch def
          {m1} 0 get j e 4 mul add /get load
          {m2} 0 get i 4 mul e add /get load /mul load
        } for
        { 3add } 0 get
      } for
    } for
    { 16 array astore end } aload pop
  ]
  end
  cvx bind def
} def mat*mat-gen
```



Language hickups

Runtime Code Generation (Postscript)

```
1 dict begin  
/3add { add add add } bind def  
... 3add ... end
```

slow

```
1 dict begin  
/3add { add add add } def  
... 3add ... end
```

fast

```
... add add add
```

```
... add ... add ... add
```

slow

