



EffectTV

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What's EffecTV?

- A realtime software video effect processor on GNU/Linux
 - Realtime= outputs images immediately
- Interactive visual entertainment
- Open source development (GNU General Public License)
- More than 40 effects (includes OpenGL effects) in this 2 years

Outline of this talk

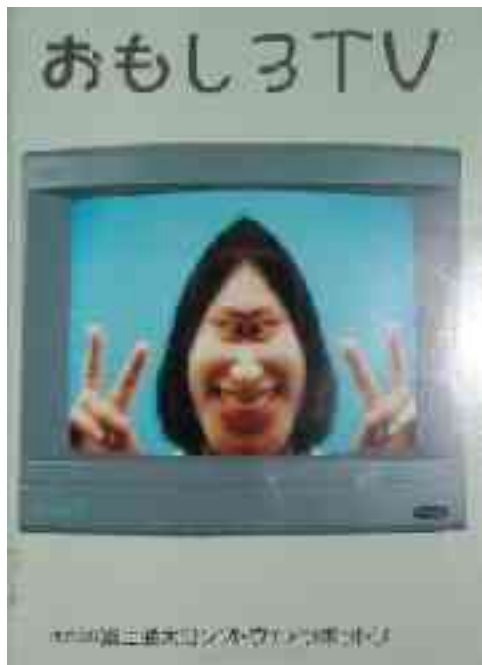
- History
- Design principal
- Case study
- Technological side
- Future work



HISTORY

History before EffectTV (1)

- “Omoshiro-TV” (Fujitsu, 1991)
 - Commercial application runs on FM-TOWNS
 - Basic video effects in realtime



p1k53l



Off: What's FM-TOWNS?

- Fujitsu's original PC
- 1st IA-32 based product in Japan
- The great optional peripheral -
“Video card”
 - Captures video images in 320x240,
30 fps
 - Digitized pixels are stored into
video RAM directly
 - Can be driven from BASIC!!

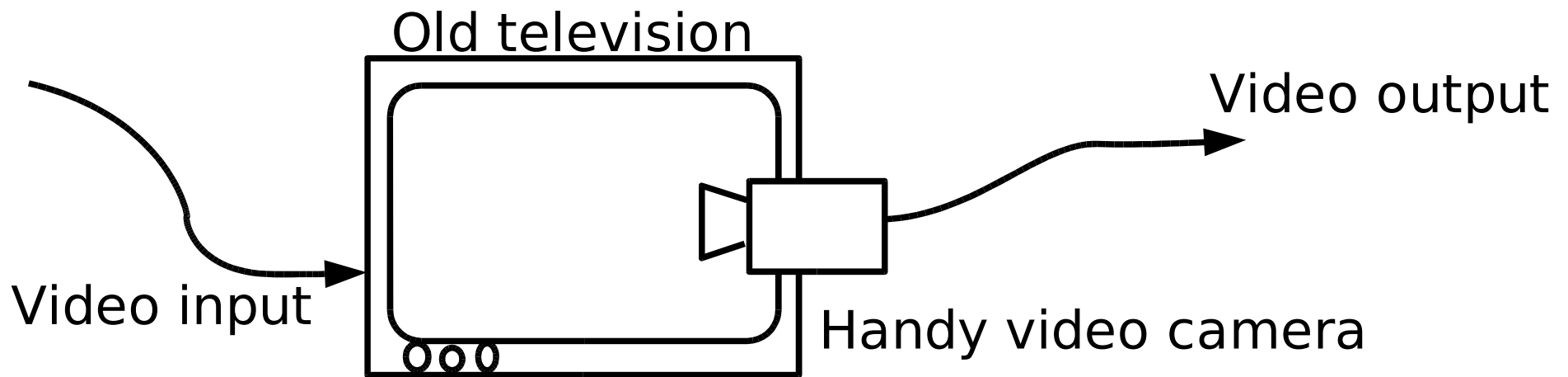
History before EffecTV (2)

- “Simura”, “FreeProjection” (1995-7)
- My 1st effectors for FM-TOWNS
- Mirroring, color distorting, coordinate transformation
- Used for VJ works by Shutaro Oku

*1st generation realtime software
video effect*

Off: how was hardware video effect?

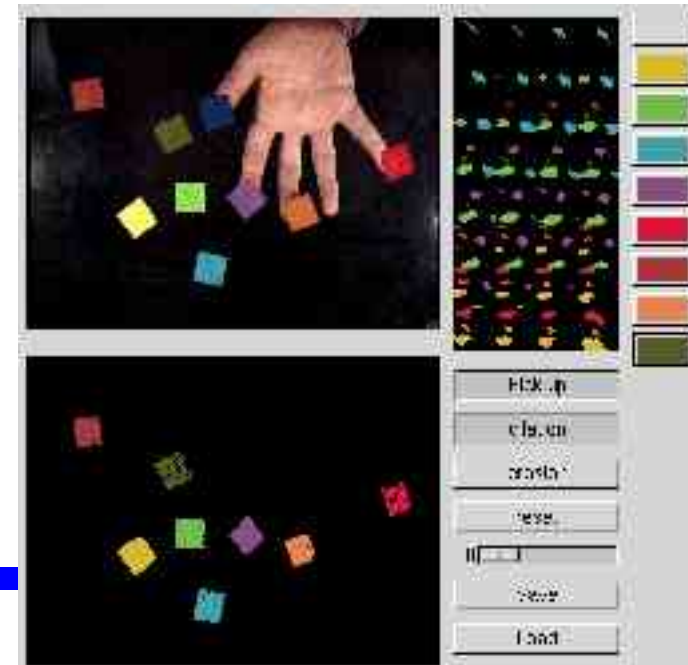
- Commercial video mixer product had some basic effects
- Beyond the basic effects:



A couple of knobs
- V-sync, color balance

History before EffecTV (3)

- Finished my master thesis (2000)
 - “Multiple pointing input system”
 - Developed a video image based position recognition system on GNU/Linux
 - Includes “v4lutils” which wraps raw system calls to drive video4linux



History after EffecTV

“Now the time to implement my 2nd generation realtime software video effect!”

- 2001.2.14, version 0.1.0 released
 - 2.15, version 0.1.2
 - 2.18, version 0.1.3
 - 2.20, version 0.1.4

and so on...

This is the power of open development

Off: How to advertise your project?

Rules by Satoru Takabayashi

(author of migemo & namazu)

- Post announcements
 - Freshmeat, Sourceforge, Savannah
- Put Web pages on WWW as soon as possible, before release the 1st version
- Unique project name, begins with 'a' or 'b'
 1. [EffecTV](#)
 2. FreeJ
 3. MoB
 4. Veejay



DEMO



DESIGN PRINCIPAL


Concept

Second generation of “realtime software video effect processor”

- Motion sensitive
 - derived from image recognition techniques
- “demo” code
 - “surprising”, in other word

Design Principal

- Highly interactive
 - Not only see, but play!
- Easy to play
 - Just like “TV”
 - No extra interactive part
- Easy to code
 - Simple API
 - Monolithic binary



CASE STUDY

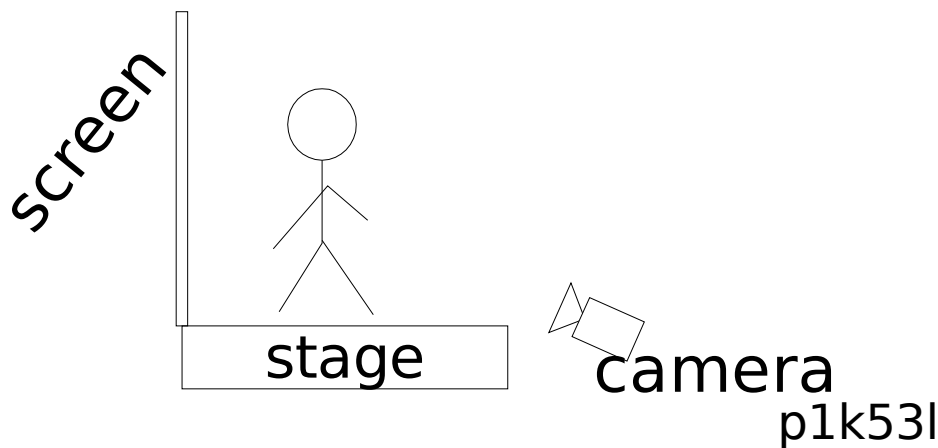
Style classification

2 styles of use-case

- “see yourself”
 - Users see themselves with effect
 - Like a “Magical mirror”
- “show up the stage”
 - A part of visual presentation
 - VJ, theatrical play

“show up the stage” case-1: VJ

- Mostly for “live VJ”
 - A band plays on the stage
 - Cameras follow the musicians
 - ↘ Naturally realtime effect was needed
- Setting



Case-1: VJ (2)

- Techniques:
 - Camera motion rules
 - zooming in/out, shaking, shooting audience
 - Problem: usually camera and effect operator are different. (remote control?)
 - Loopback effect
 - Shooting on the screen on the stage

Case-2: theatrical play

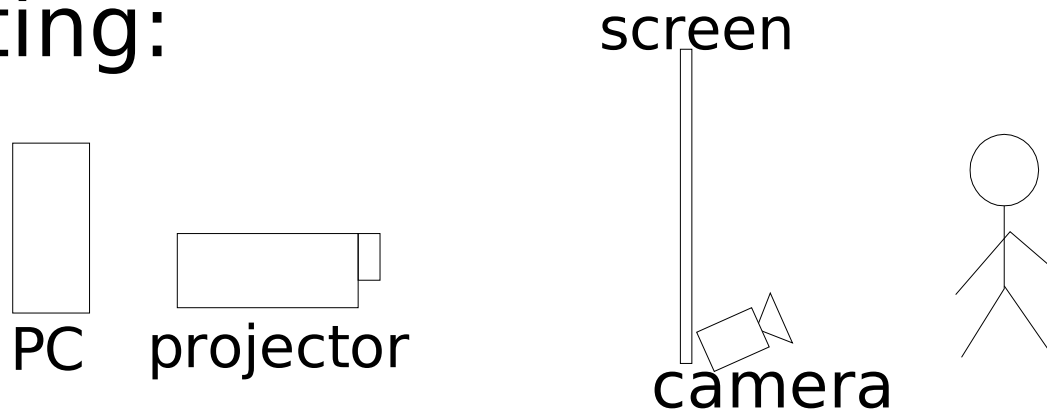
- “Shitsuon” (horror, ghost story)
 - RadioacTV for an actor played ghost
 - All other actors couldn't move
 - BurningTV for the last scene
 - The stage was fired
- “Lucy 26” (commedy)
 - Used for opening atraction
 - Every actors stood besides the stage, and output was projected on the screen on the stage

Case-2: theatrical play (2)

- Problem: people want to see actors, not the screen
 - To avoid loopback effect, the screen must be distant from the stage
 - Who wants to see the screen instead of the actors in front of them?
- Solution (undergoing):
 - Adds only SpFX (fire, radioactive), doesn't contain original image
 - as such “special spot light”

“see yourself” case-1: rave party

- “metamorphose” “AsagiriJAM” open-air rave party at Mt. Fuji
- Setting:



- Infrared camera is recommended
- People tried to find new motion to get more interesting effect
- **During those trials, you can not change effects!!**
- Playing with various goods: e.g. pen lights, juggling balls, toy samurai-sword

“see yourself” case-1: rave party(2)



“see yourself” case-1: exhibition

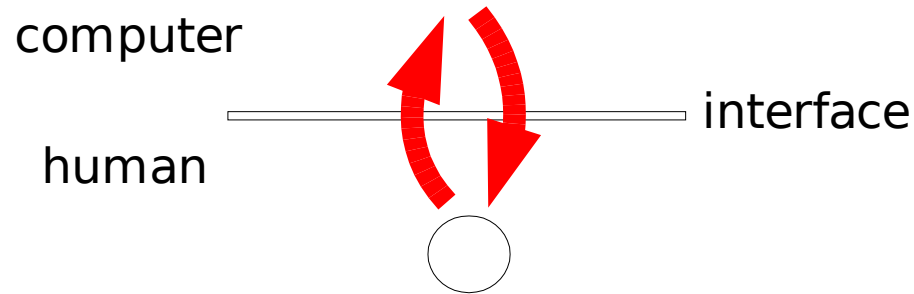


- Allowed people to change effects with newly created console

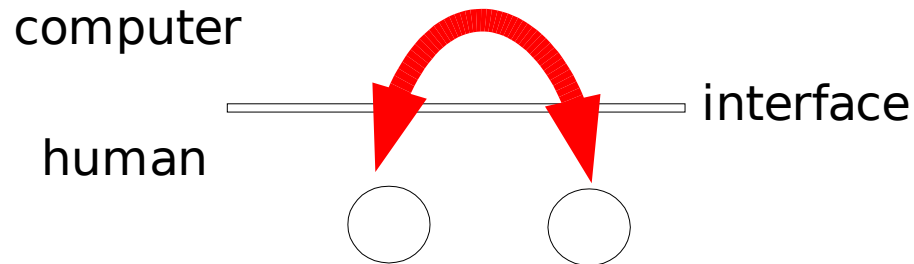
Study of “see yourself”

- The structure of “interaction”

- Stage 1



- Stage 2





TECHNOLOGICAL SIDE

Technological Side

- Motion detection
- Pseudo SIMD (single instruction, multiple data)
 - Processing RGB data in parallel
- Pseudo conditional instructions (cMov, cAdd)
 - To avoid conditional branches



FUTURE WORK

Future work

- Ongoing
 - Modularized new API
 - Console (GUI, switch box)
 - Audio input
 - Freq. Analysis

Thanks

- gcc
- Linux
- SDL
- video4linux
- BEK/KHIB