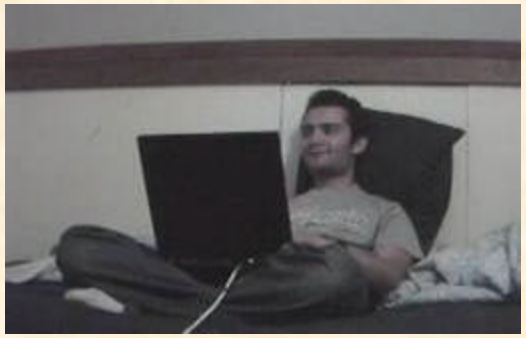
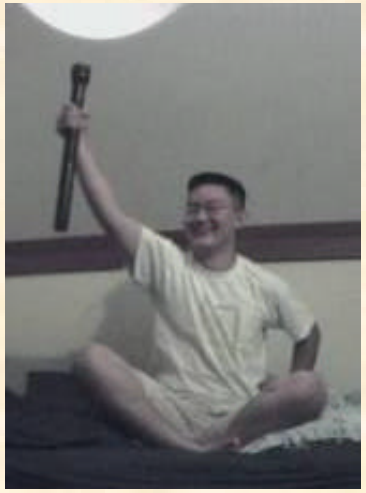
Internet Controlled Rover

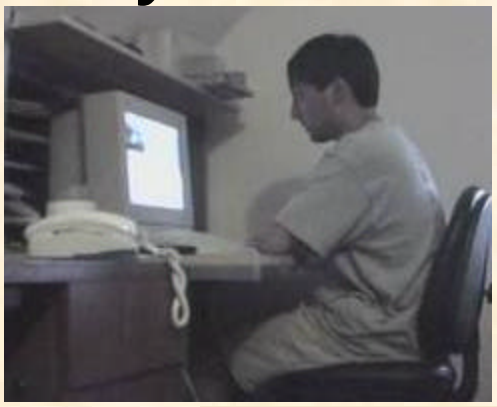
Farzad Eskafi





Ling Xiao

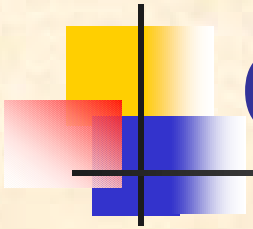
Bryon Ross



{feskafi, xiaoling, bryonr}

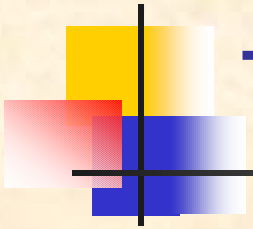
@ uclink.berkeley.edu

Next Generation Internet (NGI)



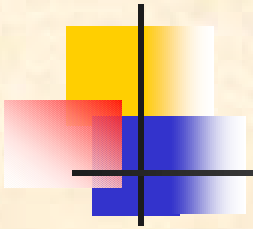
Outline

- The Situation
- Internet Control Rover
- Architecture and Design
- Did we meet our goal?
- Future Work
- Summary



The Situation

- To visit a tourist location you need:
  - Money
  - Mobility (temporal & spatial)
  - Effort
- However, most Internet users are:
  - Cheap
  - Sedentary



Internet Control Rover

- **Main Idea:** Small Remote Control device.
- **Features:**
  - Transmits high quality Video and Audio.
  - Works over the Internet

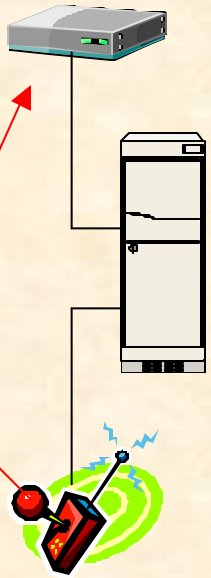
Internet Control Rover Cont.

- Pros:
  - Saves time and money
  - Could go to places where humans can’t
  - Interactive Experience
- Cons:
  - Limited Access to Information
  - Not Real

Architecture & Design Overview

Taj Mahal

Agra, India



Internet2

Connection

Alice

U.S.

U.K.

Bob

A&D Details (Client/Server)

CLIENT SIDE
Video Thread
Sound Thread
Chat Program
Control / Main Thread

Video
Sound
Chat
Control

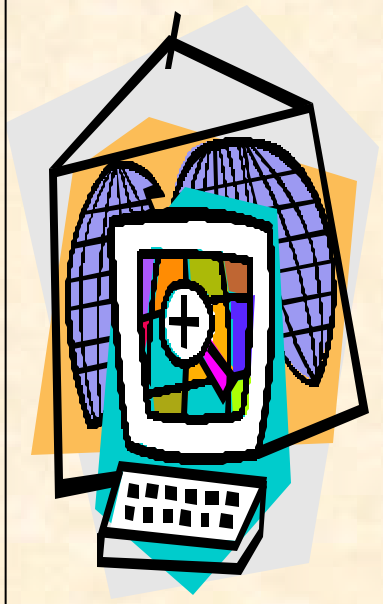
Server Side
Video Thread
Sound Thread
Chat Thread
Control Thread

Technology Used for
Server Client Interaction:

Internet2
Java

A&D Details (Server)

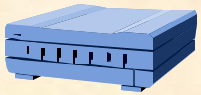
SERVER



Sound

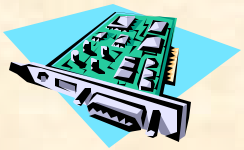
Radioshack Two-way
Personal Radio

Video



Linksys 2.4 GHz
Wireless USB Adapter

Control



SK-167CR
Micro-Controller

Radioshack Remote
Control car Remote

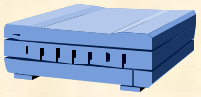
A&D Details (Components)

Radioshack Two-way
Personal Radio

Sound

Sound

Radioshack Two-way
Personal Radio



Linksys 2.4 GHz
Wireless USB Adapter

Video

Video

Wireless

D-Link DCS 1000W
Wireless Camera

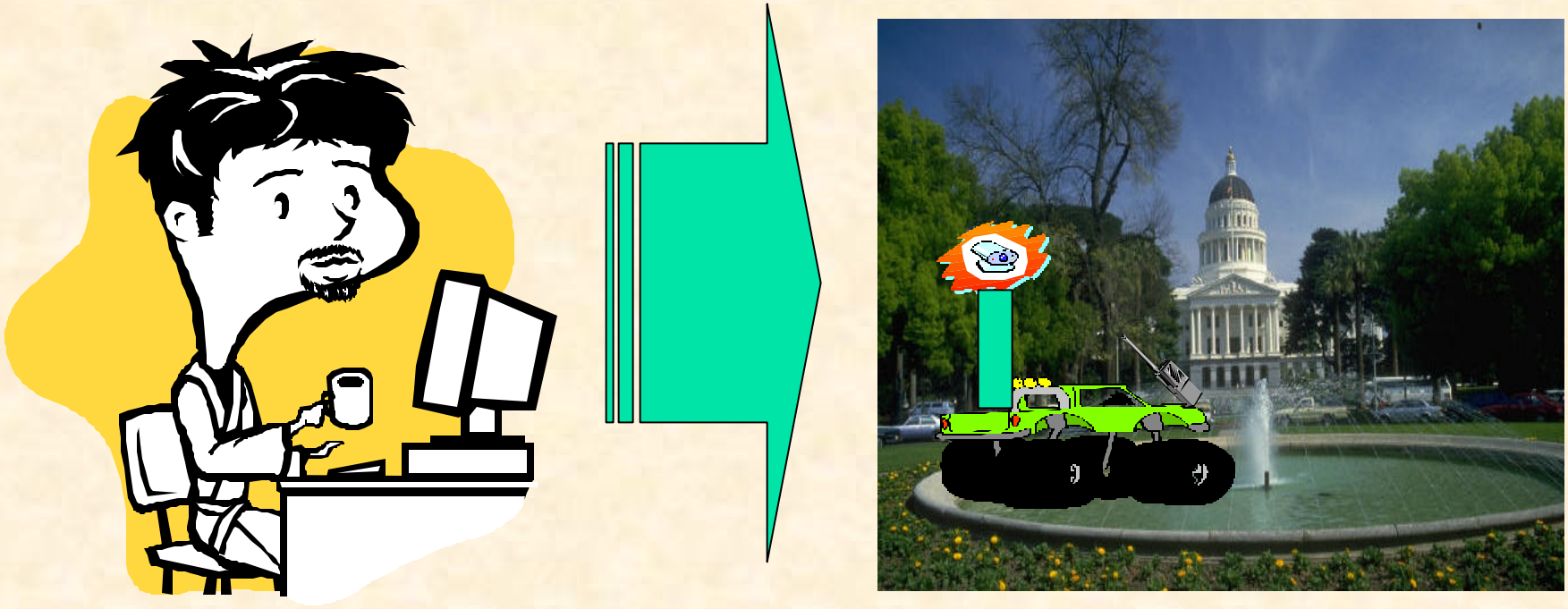
Radioshack Remote
Control car Remote

Control

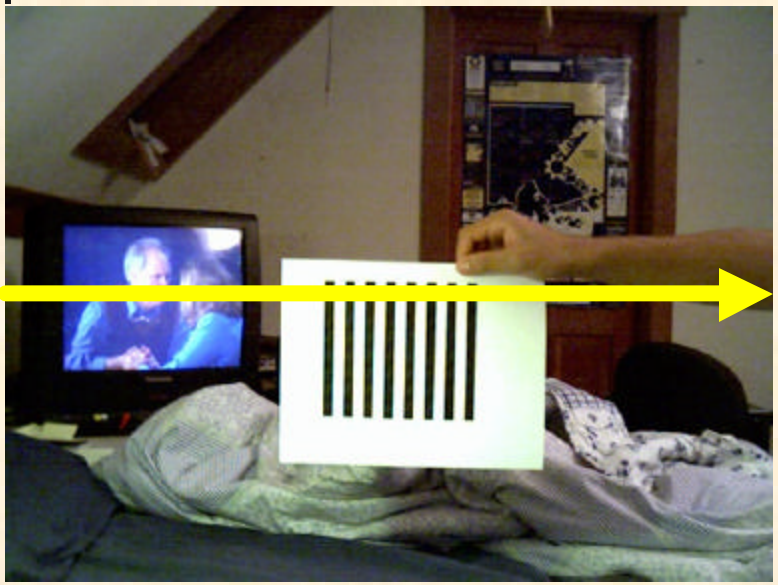
Control

Radioshack Remote
Control car

A&D Details (Conclusion)



A&D Details (Bar Detector)



Transition Widths:

4 5 50 20 10 30

8 9 10 7 9 8 8 7 9 10

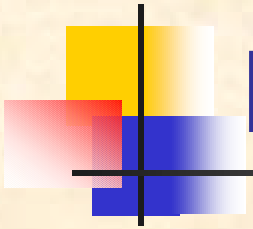
8 9 7 9 7

33 50

Transition Widths:

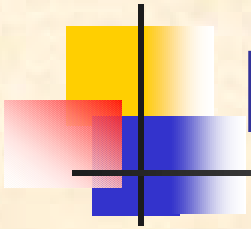
4	5	50	20	10	30	8	9	10	7	9	8	8	7	9	10	8	9	7	9	7	33	50

= 15 transitions = 8 Bars



Did we meet our goal?

- Problem(s):
  - Signal Interference
  - Latency
  - Others
- Testing:
  - Functionality Testing
  - QoS Testing
  - Crash Testing

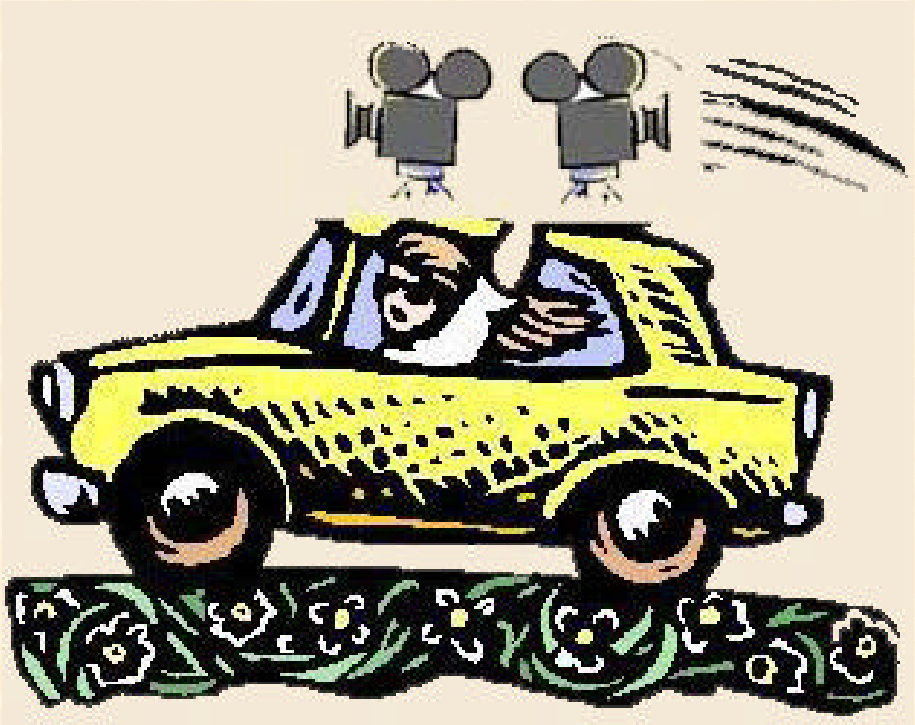


Future Work

- Multiple Views
- More Interaction with the Environment.
- Going to different “Environment”.
- Others

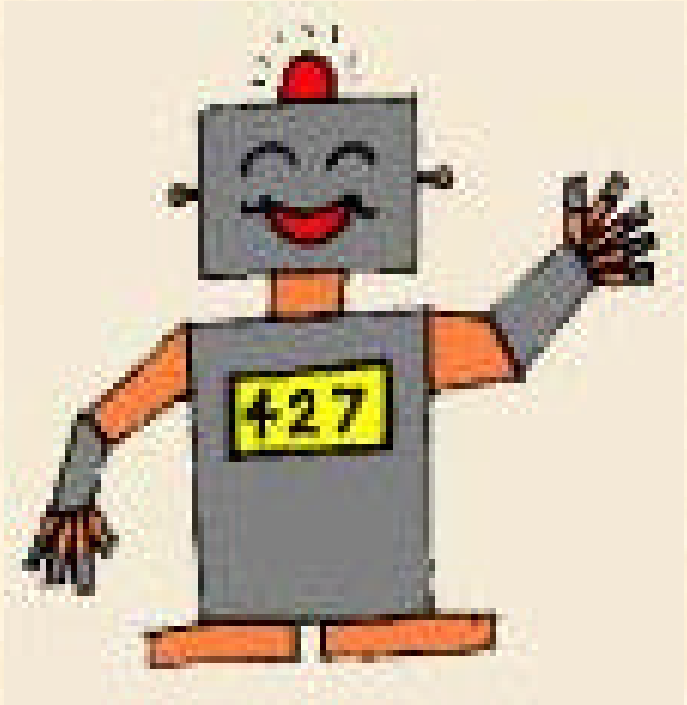
Future Work Cont.

- Multiple Views



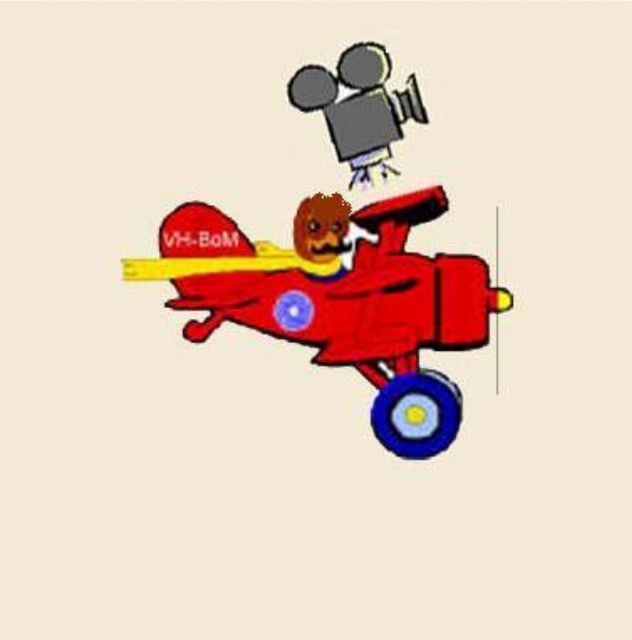
Future Work Cont.

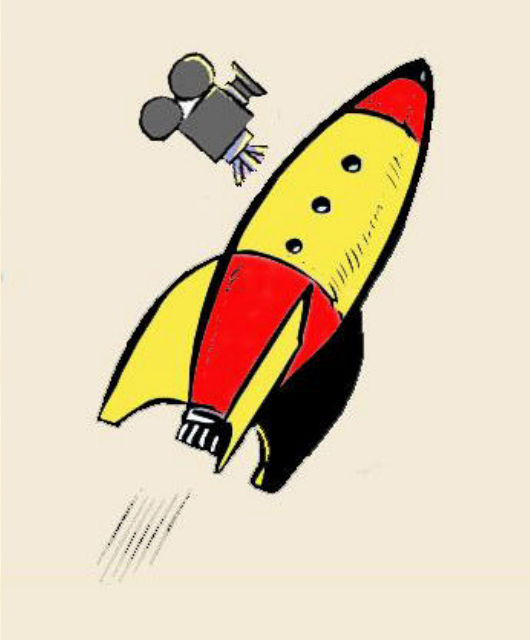
- More Interaction with the Environment

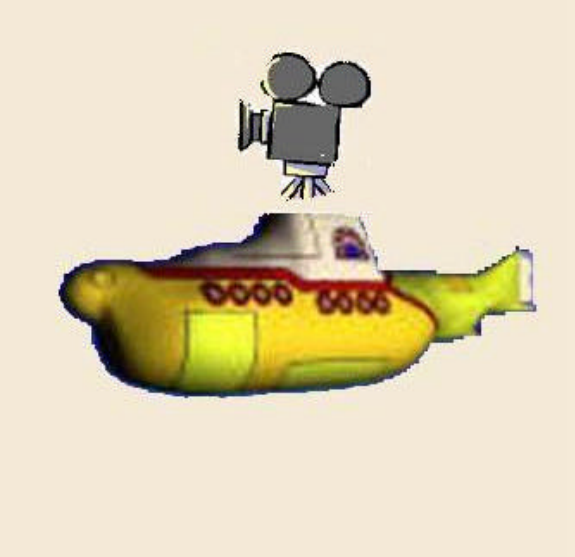


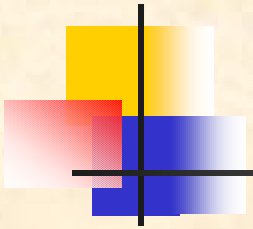
Future Work Cont.

- Going to Different “Environments”



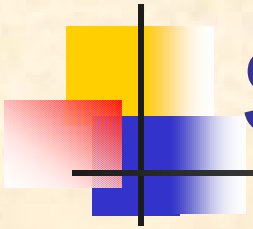






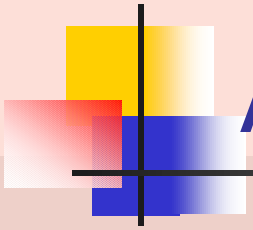
Future Work Cont.

- Better Tools and Devices
- Even Higher Bandwidth and Speed
- Paint the Rover



Summary

- Small Remote Control Device roaming around interesting places
- Saves time and money
- Works over Internet2



Acknowledgments

- **Steven Czerwinski (Graduate Advisor)**
- **NGI/CCIT**
- **CommerceNet**

DEMO Time