Where to Next?

Agenda

- Out in the real world
- 4th year courses
- 4th year projects
- Masters
- PhD

Out in the real world

- Usability Professionals Association
  - Auckland chapter http://www.upa.org.nz/
- Chi conferences
  - CHINZ http://sigchi.org.nz/conferences/ July each year
  - OZCHI http://www.ozchi.org/ December each year

4th year course

- Semester 1
  - CS 705
  - SE 702
- Closely linked to research of people taking it.
  - 6 weeks of lectures
  - 6 weeks of seminar and project presentations (students' work)

Seminars

- Do a literature review on a topic

- Brain computer Interaction
  - Craig Sutherland
- Gesture Interaction
  - Danny Wei

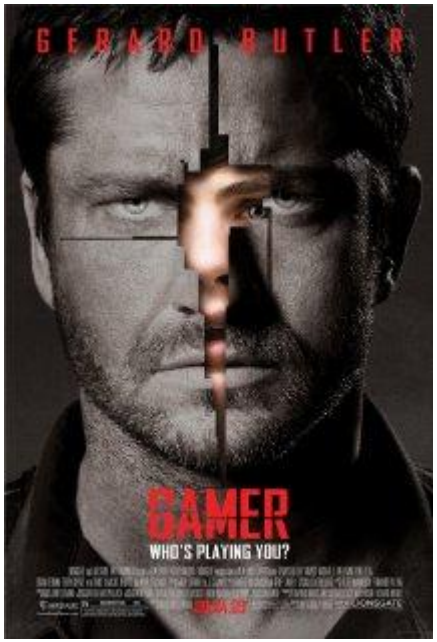
Plug in the Brain
Current Brain Computer Interfaces

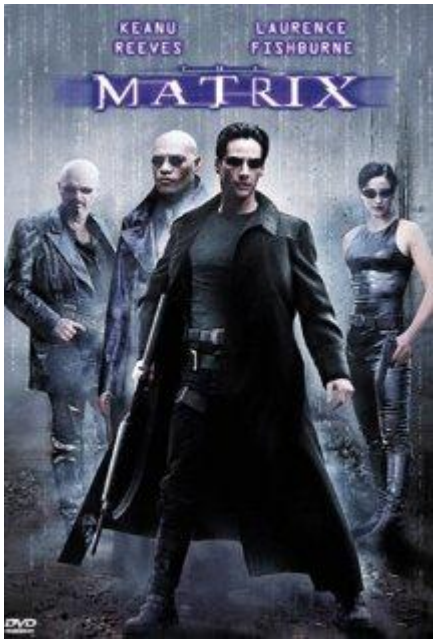
Craig Sutherland

Wednesday, June 01, 2011

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

BCI – Fact or Fiction?





Where Are We Now?

EEG

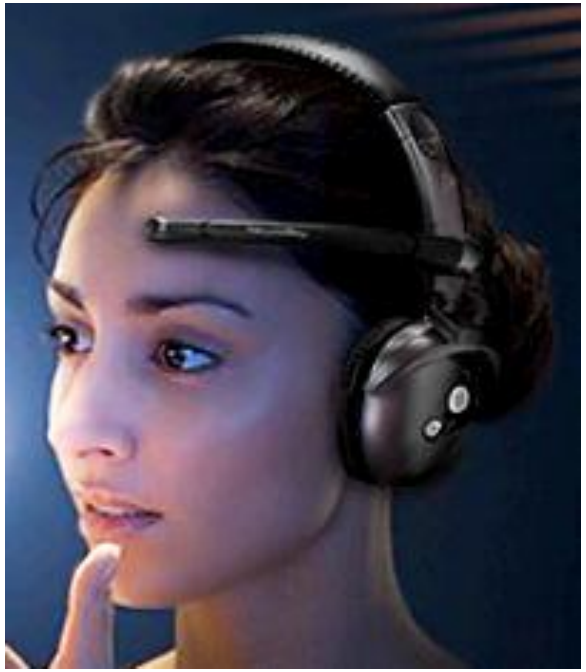
NIRS

fMRI

Commercial Products

Emotiv *EPOC*

StarLab *Enobio*



NeuroSky *MindSet*

Limitations

- Speed/Accuracy
- Training Time
- Interaction Options

References

- Biao, Z., Jianjun, W., and Fuhlbrigge, T. A review of the commercial brain-computer interface technology from perspective of industrial robotics. In *ICAL 2010 IEEE Int. Conf*. (2010), 379-384.
- Bos, D.P.-O., Poel, M., and Nijholt, A. A study in user-centered design and evaluation of mental tasks for BCI. In *17th Int. Conf. on Adv. in Multimedia Modeling*. (2011), 122-134.
- de Negueruela, C., Broschart, M., Menon, C., and del R. Millán, J., Brain–computer interfaces for space applications. *Pers. and Ub. Comp*., (2010), 1-11.
- Edlinger, G., Holzner, C., Guger, C., Groenegress, C., and Slater, M. Brain-computer interfaces for goal orientated control of a virtual smart home environment. In *NER '09. IEEE/EMBS Int. Conf*. (2009), 463-465.
- Jackson, M.M. and Mappus, R., Applications for Brain-Computer Interfaces. *Brain-Computer Interfaces*, (2010), 89-103.
- Kauhanen, L., Jylanki, P., Lehtonen, J., Rantanen, P., Alaranta, H., and Sams, M., EEG-based brain-computer interface for tetraplegics. Intell. *Neuroscience*, (2007), 1-11.
- Kohlenberg, J. and Chau, T. Detecting Controlled Signals in the Human Brain by Near Infrared Spectroscopy. In *EMBS '06. 28th IEEE Ann. Int. Conf*. (2006), 5480-5482.
- http://www.emotiv.com/
- http://www.neurosky.com/
- http://starlab.es/products/enobio

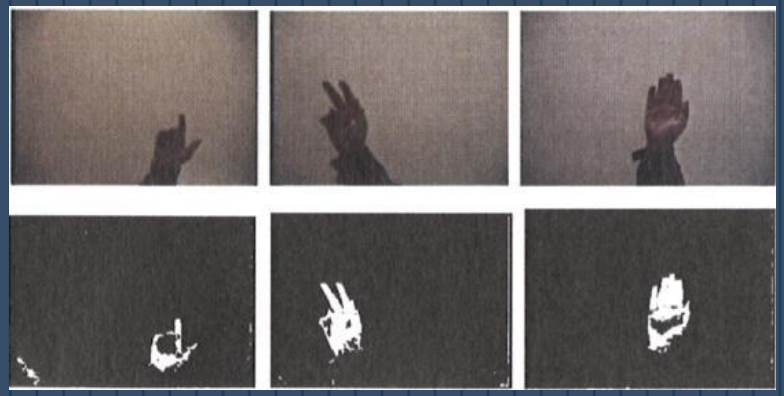
Can You Hand-le the truth? A Review on Modern Gesture Recognition Techniques

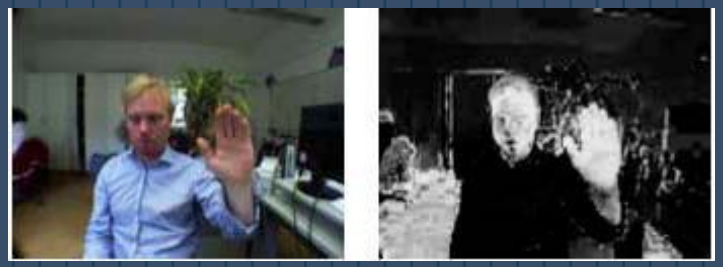
By Danny Wei

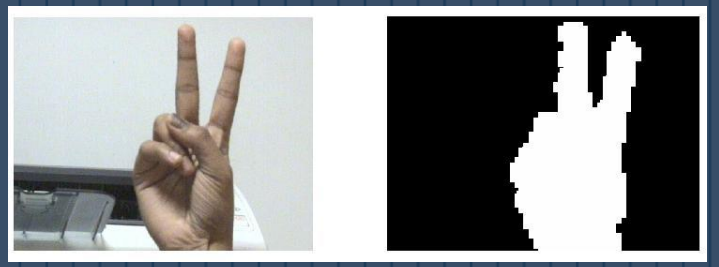
Introduction

Problems with Hand Detection

- Skin Models
  - Different Skin Colors
    - Face color sampling
    - Skin models
    - Double Model Overlapping
  - Skin Colored Objects
    - Broad model and adaptive model
    - Geometric feature and skin model

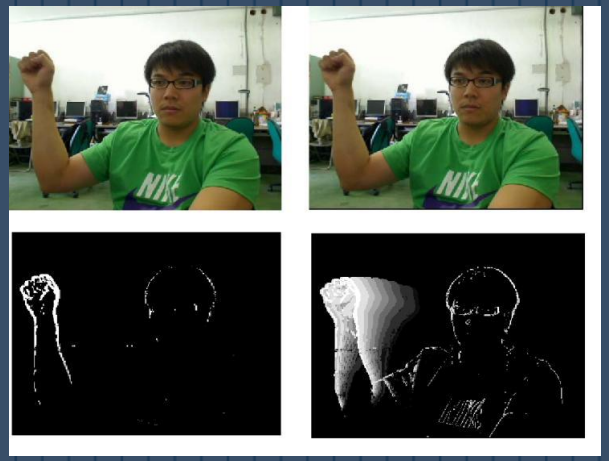






Problems with Gesture Recognition

- Gesture Recognizing
  - Correct Recognition
    - Learning Based
    - Rule Based
- Real-time Recognition
  - Lower data and computation needed
  - Estimate Values
  - Better hardware



Conclusion

- Tradeoff
- Application Dependent

Future Work

- Multi-camera recognition
  - Better accuracy
  - More speed
- Portability
  - Cell phones
  - At shops
  - Bus stops

Projects

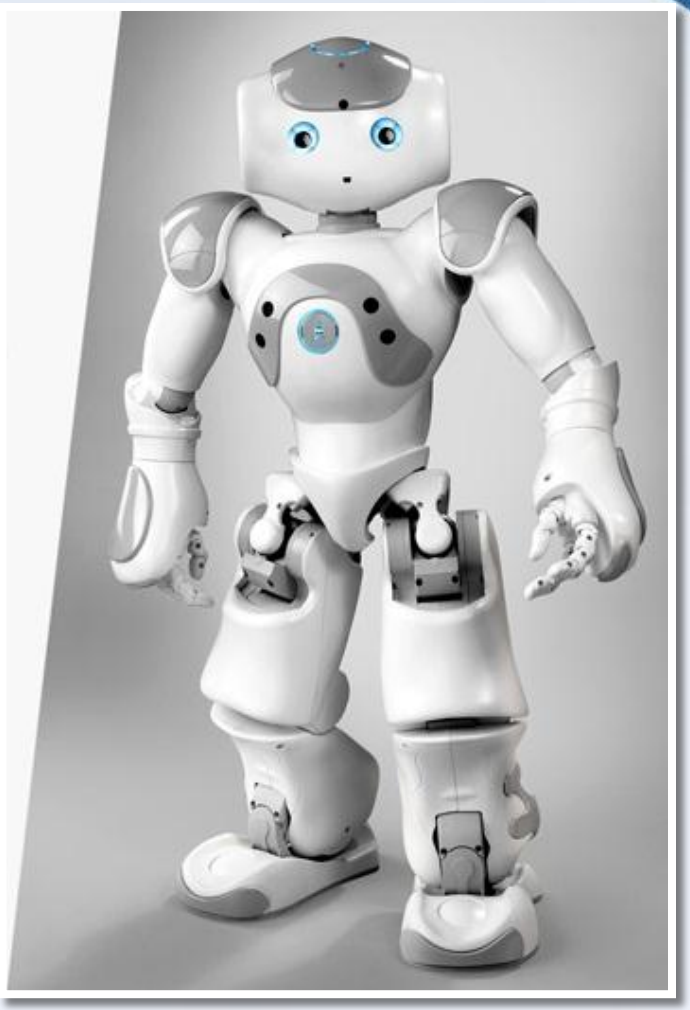
- Something Practical –programming, design, evaluation
- Meeting with a robot
  - Safurah Abdul Jalil & Jingwen Huang
- Multi-touch drafting
  - Dong Lin & Yang Shi

REMOTE AVATARS:

EXPLORING APPROPRIATE EMOTIONAL GESTURES FOR A NAO ROBOT IN A MEETING

by :

Safurah Abdul Jalil &
Jingwen Huang



OVERVIEW

- remotely controlled avatars are now extended to a physical representation rather than restricted to just virtual characters.
- telepresence strives to achieve the illusion of presence at a remote location.

1) Background study
- Remote avatars
- Gestures

2) Develop Meeting Gesture set & implementing --> Nao robot

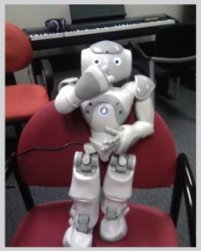
3) Conduct Mock-up Meeting / usability testing
- PRE-PRODUCTION
- PRODUCTION
- POST-PRODUCTION

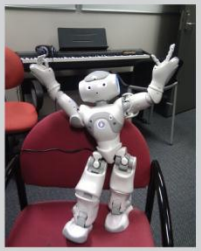
4) Findings

MEETING GESTURES SET

Categories	Intentions
Non-verbal Gestures	**Affective** • Approval / agreement • Disapproval / disagreement • Positive (delighted, happy, etc) • Negative (impatient, frustrated, angry, disappointed, etc) **Alert** • Request to speak • Distress signal **Greet** • Hello • Goodbye
Speech Supporting Gestures	**Indicating sizes** • E.g. Big, large, small, little, tall. **Pronouns** • I / me / myself • You / yourself **Directions** • I / me / myself • You / yourself
Physical Contact Gestures	**Human-initiated touch** • Pat **Robot-initiated touch** • Tap **Cooperative touch** • Hand-shake • High-five

Non-verbal Gestures


Surprised


Happy/ Exhilirated

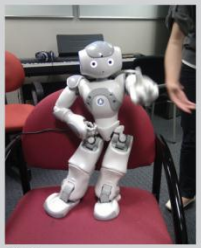
Impatience

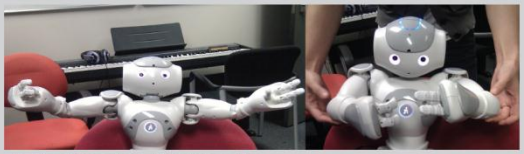
Thinking

Speech Supporting Gestures

I /me /myself

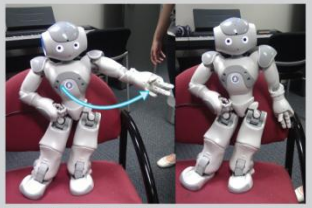
Speak Up


You


Indicating Size (Big/ Small)

Disagreement (shaking head)

Agreement (shaking head)


They/ All of you

Physical Contact Gestures

Human-initiated touch

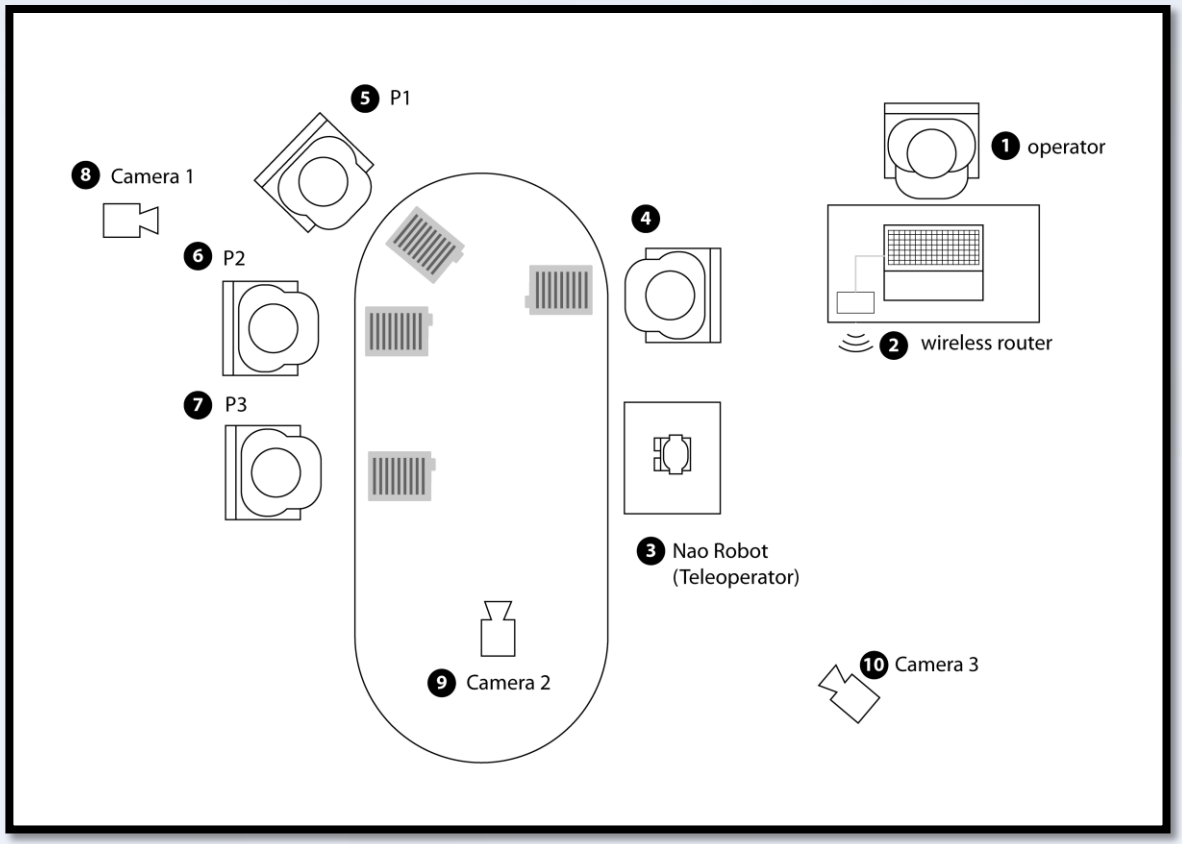
Pat

Cooperative Touch

High-five

Hand-shake

THE MOCK-UP MEETING



Project team (3)

- (1) Operator - operating Nao (3)
- (4) Moderator

Cameras (4)

- 3 Static cameras - (8), (9) & (10)
- 1 Free camera - (not in picture)

Participants (3)

- (5), (6), (7)

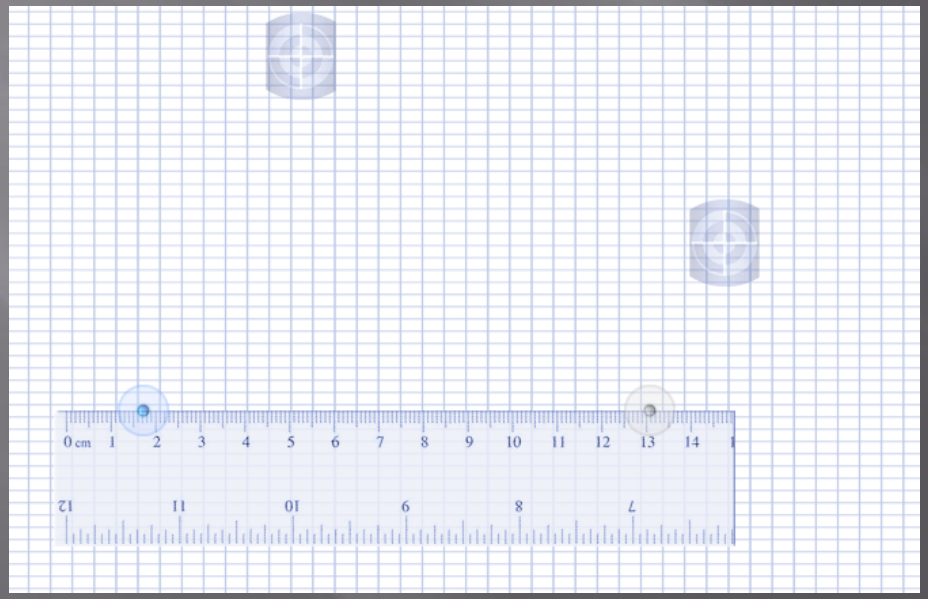
[Video (YouTube).]

OUR FINDINGS

- Participants do not find having gestures in a meeting useful
- Teleoperator (Nao) still perceived as a robot rather than having an actual person operating behind it.

705 MULTI-TOUCH DRAFTING

Yang Shi & Dong Lin

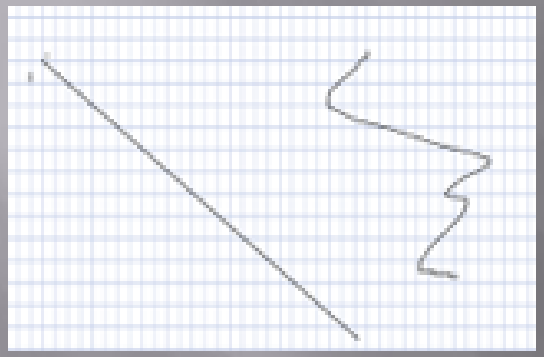


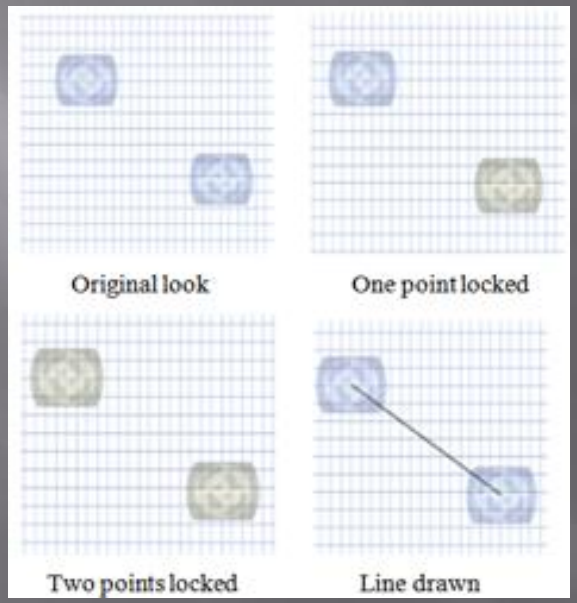
Objective

- Focus
  - exploring possibilities of multi-touch sketching. i.e. using one hand to position drafting tool and other to scribe lines.

However, is this the smartest solution?

Approaches

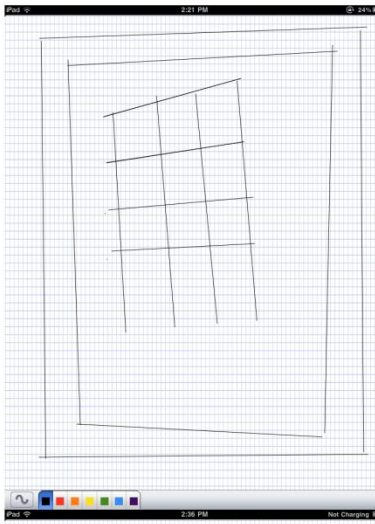
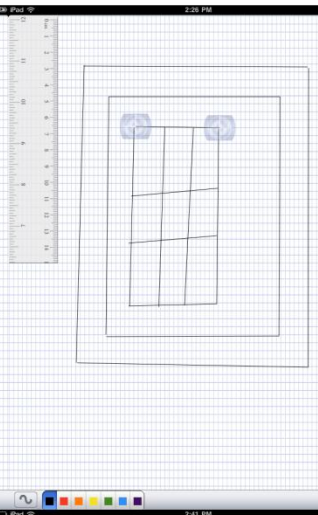
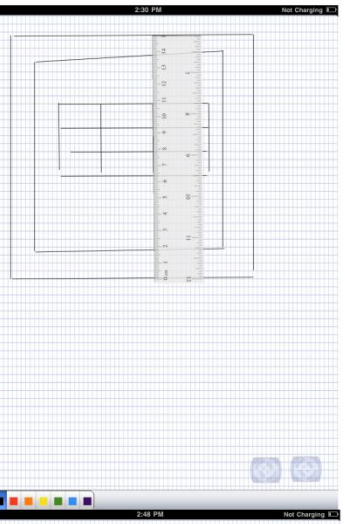
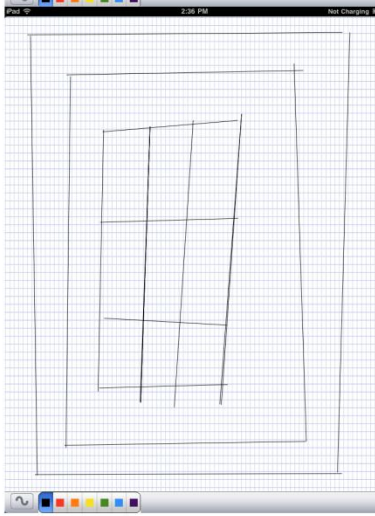
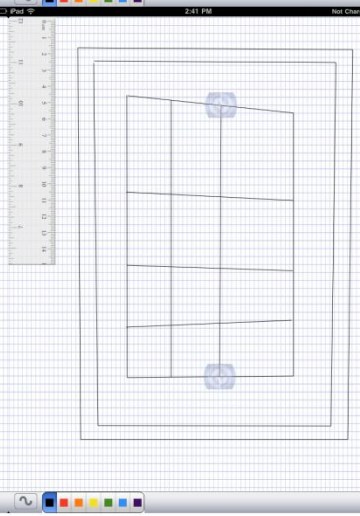
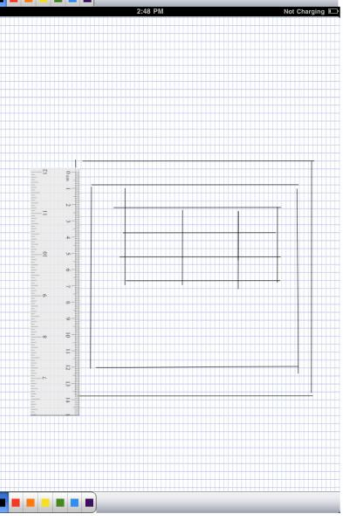




Simply touch	Cross Hair	Virtual Ruler

VIDEO DEMO

Evaulation

	simply touch	crosshair	virtual ruler
Candidate 1			
Candidate 2			

Conclusion

- Adapting appearance and interaction style of real-world objects can make your program more user friendly but it is not the only solution to tablets apps
- It is also important to think about how to utilize the hardware environment
- It is possible to have a mixed solution but be aware of the problem of control overlap

Master & PhD

- You need
  - A supervisor
  - A topic
- Sometimes you have a topic and you will be looking for someone to supervise.
- Sometimes you have a supervisor and they provide a topic.
- Usually it’s a negotiation

HCI Researchers

- Robert Amor
- Beryl Plimmer
- Robert Sheehan
- Gerald Weber
- Christof Lutteroth

Robert Amor - HCI in a Specific Domain

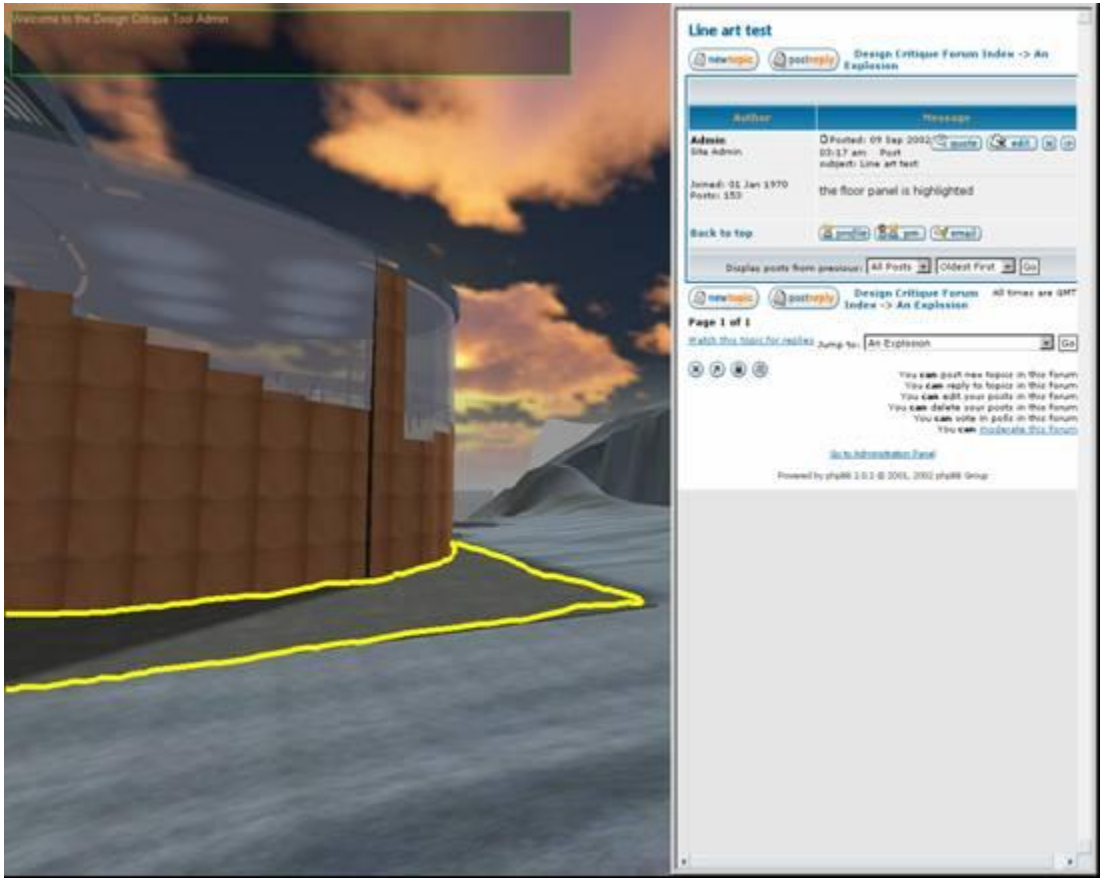
Architecture/Engineering/Construction

- Design and build incredibly complex structures

The Wave in Vejle (T Molvig)

Burj Dubai

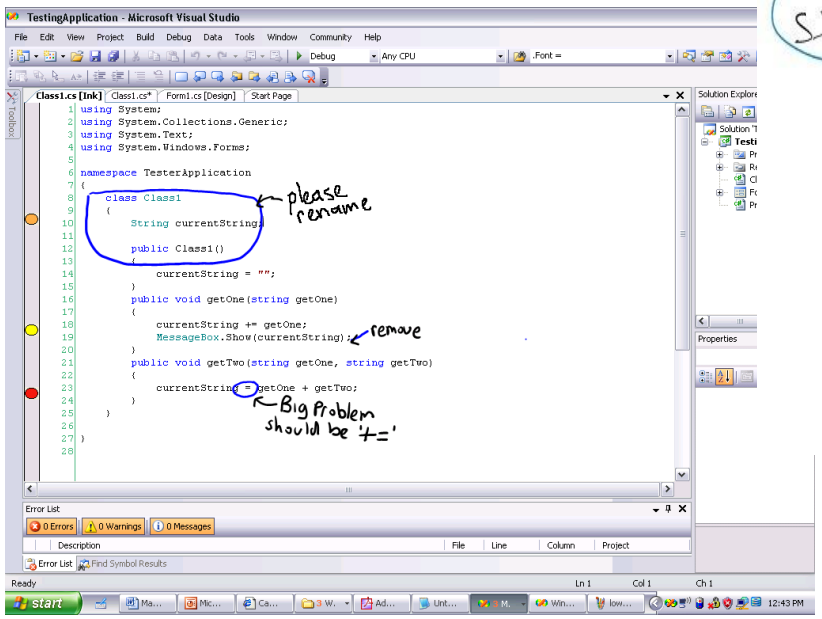
Approaches to design interaction
Critique within a game engine

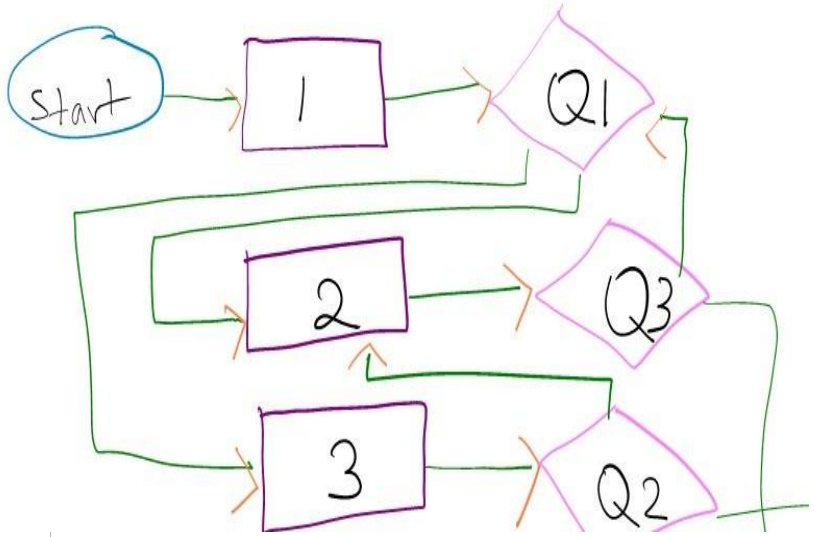


Trial of new interaction devices
LIDS; Kinect; Augmented Reality

Beryl Plimmer

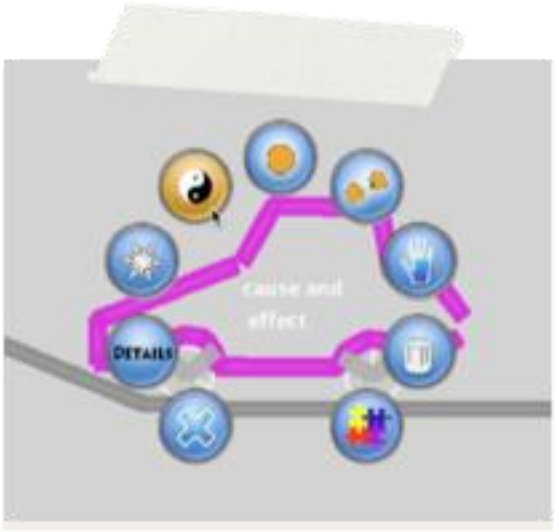
- Pen and touch based interaction
- Gesture recognizers



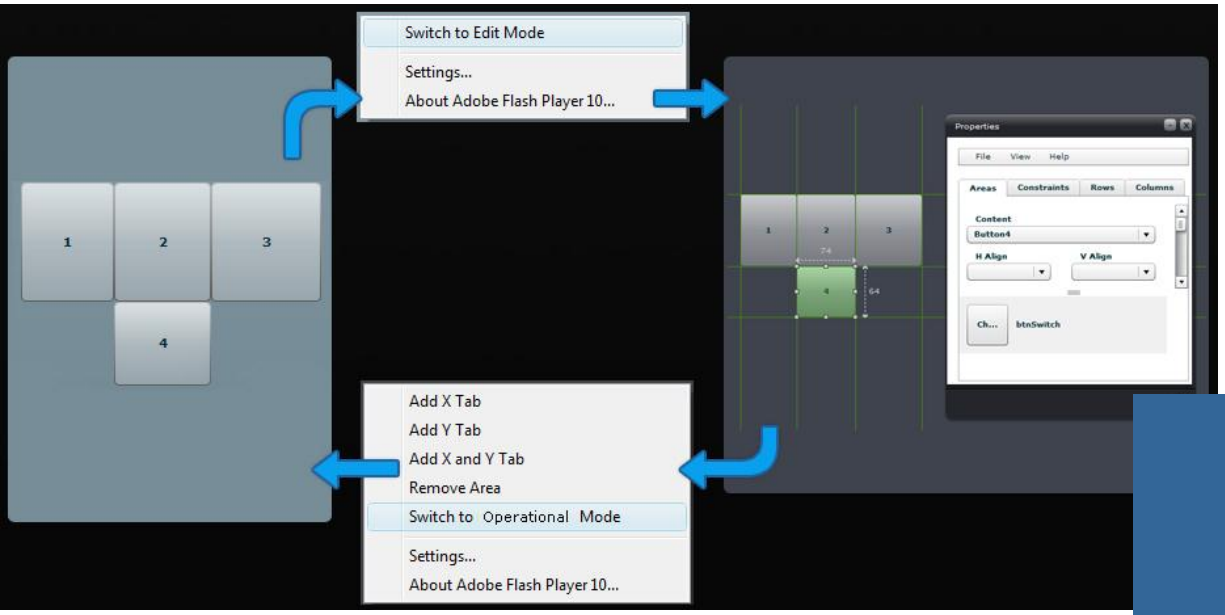


Robert Sheehan

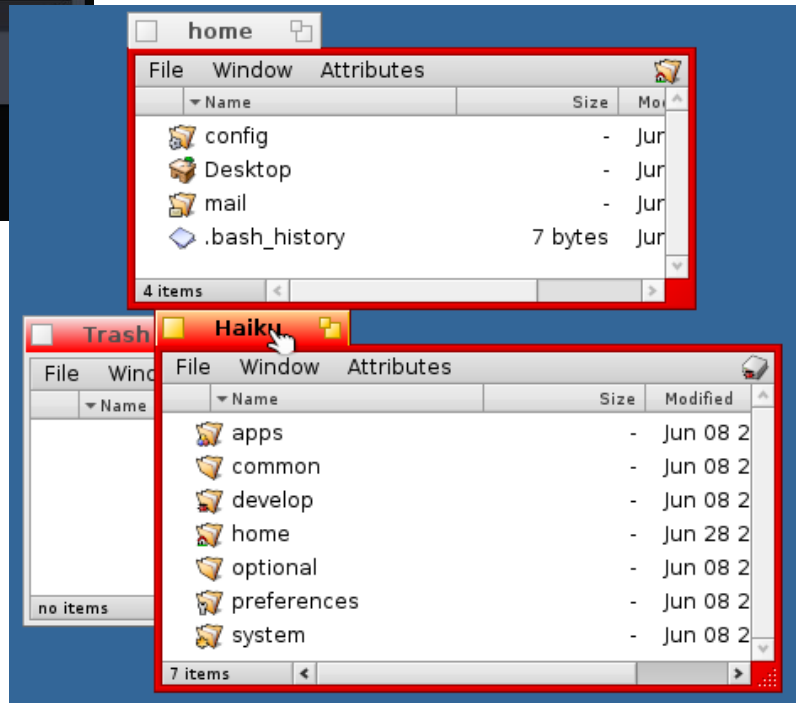
- Child computer interaction
- Particularly programming environments for 8 - 12 year olds (also fun for adults)
- Several prototype systems
  - Icicle
  - Fizz (Part IV projects)



Christof Lutteroth – How can (normal) users change (complex) programs?

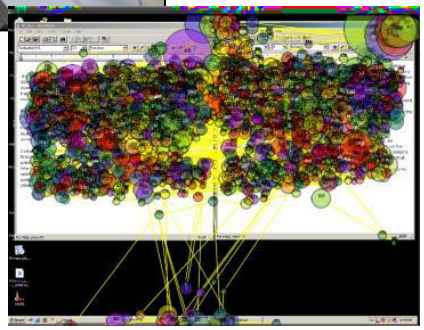


Changing a GUI during runtime with the Auckland Interface Model (in Flash)

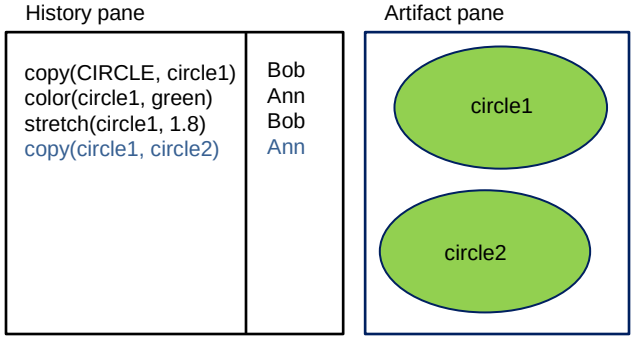


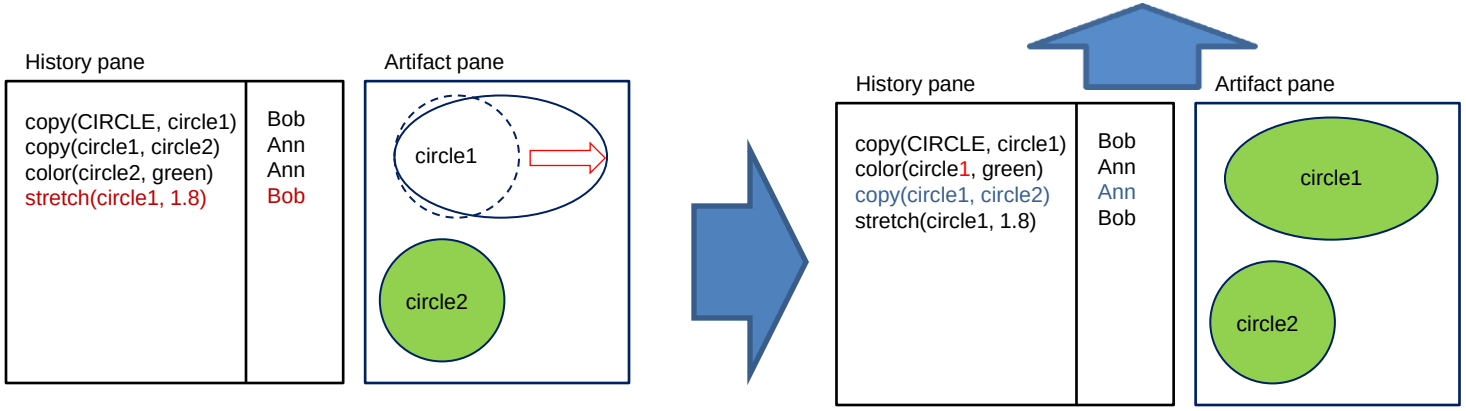
Grouping windows with the Stack & Tile window manager (in the Haiku open-source OS)

Gerald Weber



- UofA since 2003
- New interaction methods based on eye tracking
- New techniques for distributed collaborative and creative work.
- Also other fields: enterprise applications, theory





Exam

- Robert's part 30%
- Beryl's part 70% (tomorrow)