CS415
Human Computer Interaction

Lecture 11 – Advanced HCI

Part-2

© Sam Siewert

Assignments

- Assignment #5 – Explore HCI's, Propose Group Project (Groups of 3)
- Assignment #6 – Proof-of-Concept or Evaluation with Final Report
- Final Oral Exam – Presentation of Project
- Myself, Jim Weber, Dr. Davis, Dr. Bruder
- Controls Lab Student Monitors
  - 9-5 on Sat, 12 noon – 9pm Sun

© Sam Siewert

Reality – Hybrid of 3 Models and …

- HCI – GOMS + Linguistic + Physical + Intelligence
- Newell and Simon [CMU, AI]
- Power of Recursion, 1958 NSS Chess – E.g. Minimax Search

Herbert Simon and Allen Newell, 1958 [4]

Herbert Alexander Simon, (June 15, 1916 – February 9, 2001) was an American scientist and artificial intelligence pioneer, economist and psychologist. Professor, most notably, at the Carnegie Mellon University, Pittsburgh, Pennsylvania, which became an important center of AI and computer chess, ...Herbert Simon received many top-level honors, most notably the Turing Award (with Allen Newell) (1975) for his AI-contributions [1] and the Nobel Memorial Prize in Economics for his pioneering research into the decision-making process within economic organizations (1978) [2]

Allen Newell, (March 19, 1927 - July 19, 1992) was a American researcher in computer science and pioneer in the field of artificial intelligence and chess software [1] at the Carnegie Mellon University, Pittsburgh, Pennsylvania. In 1958, Allen Newell, Cliff Shaw, and Herbert Simon developed the chess program NSS [2]. It was written in a high-level language. Allen Newell and Herbert Simon were co-inventors of the alpha-beta algorithm, which was independently approximated or invented by John McCarthy, Arthur Samuel and Alexander Brudno [3].

https://chessprogramming.wikispaces.com/Herbert+Simon

© Sam Siewert

About 40 Years Later …

- From Algorithm to Computer Oponnent
  - YouTube Documentary
  - Randy Moulic's Team IBM / CMU

The 1996 match

Game #	White	Black	Result	Comment
1	**Deep Blue**	Kasparov	1-0	
2	**Kasparov**	Deep Blue	1-0	
3	Deep Blue	Kasparov	½–½	Draw by mutual agreement
4	Kasparov	Deep Blue	½–½	Draw by mutual agreement
5	Deep Blue	**Kasparov**	0–1	Kasparov offered a draw after the 23rd move.
6	**Kasparov**	Deep Blue	1–0	
Result: **Kasparov–Deep Blue: 4–2**				

The 1997 rematch

Game #	White	Black	Result	Comment
1	**Kasparov**	Deep Blue	1–0	
2	**Deep Blue**	Kasparov	1–0	
3	Kasparov	Deep Blue	½–½	Draw by mutual agreement
4	Deep Blue	Kasparov	½–½	Draw by mutual agreement
5	Kasparov	Deep Blue	½–½	Draw by mutual agreement
6	**Deep Blue**	Kasparov	1–0	
Result: **Deep Blue–Kasparov: 3½–2½**				

  - Kasparov Requested a Re-match, No Response from IBM
  - IBM's Page - https://www.research.ibm.com/deepblue/
  - Controversy – Game 2, Wired on "bug", Conditions
  - Chess today – http://en.playchess.com/ (GNU Chess – 1989-92)

© Sam Siewert

Is Deep Blue Intelligent?

From Dr. Randy Moulic's Slides – Deep Blue, Seoul Korean, June 2014

"… (Deep Blue has) a weird kind (of intelligence) …"
Garry Kasparov, 1996

"I used to think chess required thought. Now, I realize it doesn't."
Douglas Hofstadter, 1997

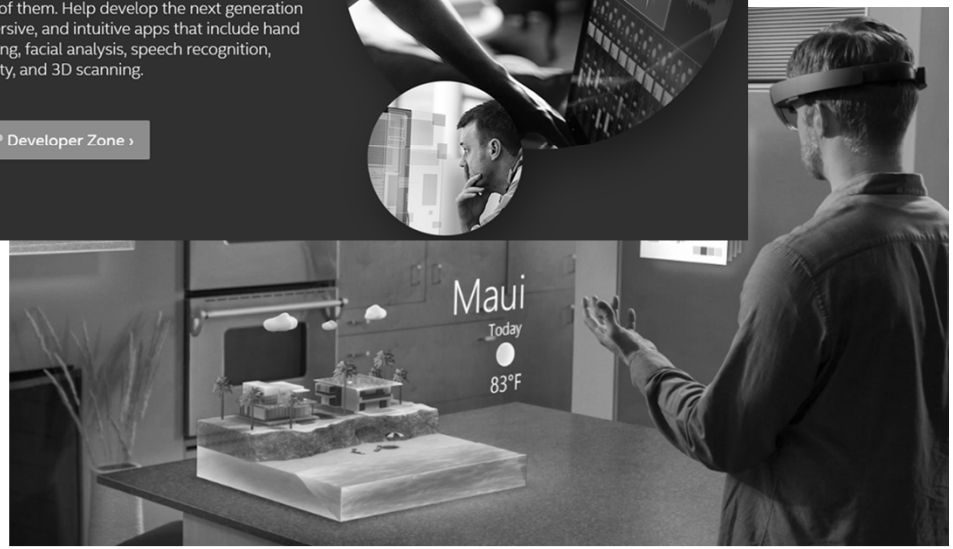
"Does it really matter if unbounded brute force analysis can achieve similar results? " *Randy Moulic*

For more information about Deep Blue, please look at :
"Deep Blue", Murray Campbell, Joe Hoane, Feng-Hsuing Hsu, Artificial Intelligence, 134, (2002), p57-83.

Advanced HCI … Future

- Microsoft Research HCI Vision

- Interesting HCI Innovations and Experiments (Examples)
  - MS Hololens,
  - Magic Leap,
  - jibo,
  - sixthsense,
  - Oculus VR,
  - NVIDIA AR/VR, PX,
  - Intel Real Sense,
  - Google Project Tango,
  - Interactive Film,
  - Gear VR



© Sam Siewert

Summary – Minute Paper

- Models for How Humans Perceive, Think and Act
- Models for Computing (State Machines, PLs, Computability)
- Models for Interaction (CLI, WIMP, PL, NLP, 3D, Neural)

- Goals for HCI and Thoughts?
  - To Extend Human Capabilities with Computers [Efficiently]
  - To Emulate How Humans Perceive and Think [for Interaction]
  - To Create an Artificial Intelligence [to Share Cognitive Load]
  - Is Human Helping Computer with Task Completion or Computer Helping Human?
  - Is HCI Inherently Linked to AI and Cognitive Psychology?

© Sam Siewert

New Interaction Concepts

- All Interesting, but Need Good Evaluation
  - Entertainment, Work, Safety, Automation, Other
  - Computers to Assist Humans and Improve Experience

- Ted Talk on Minority Report Style UI
- Pranav Mistry Ted Talk on Interaction
- MIT Media Lab – "reinvent—how humans experience, and can be aided by, technology." - History
- MIT Media Lab Founder Ted Talk

- Next, Week 12 … Augmented Reality
- Week 13 … Advanced Avionics and UAV/UAS
- Week 14 – Quiz, Review for Exam #2, A#6 Help
- Week 15 – Exam #2

© Sam Siewert