

The Cyberspace Concept

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Cyberpunk: The Idea

- Term coined in by Bruce Bethke
 - punk part reflects streetwise attitude
 - Tone tends to be dark, cynical
- Immersion in computer generated, shared worlds is a key theme
- Other themes
 - Alteration of human bodies, genes
 - Popular culture, music, media power
 - Critical of corporate power
 - Often romantic, rebellious

William Gibson

- Creates idea of cyberspace
 - Best known in novel *Necromancer*, 1984
 - Early appearance in short story "Burning Chrome"
- Science fiction writer then living in Canada
- No particular knowledge of computers
 - Writes *Neuromancer* & earlier stories on manual typewriter
 - Imagines technology in very visual, impressionistic kind of way
 - Vivid, spatial, seedy (film noir influence)



Computer Technology in SF

- Common by mid-1950s
 - Futuristic technology lags history
 - Big, expensive, central computers
 - Used mostly for mathematics
- Nobody much predicts
 - Personal computer
 - Microchips, miniaturization
 - Interactive graphics
- Main extrapolation is artificial intelligence
 - Often arrives spontaneously

Networking: Fiction

- Little realistic treatment pre-1980
 - Much more focus on AI than networks
 - John Brunner, *Shockwave Rider*, 1975 invents idea of computer "worm"
- Vernor Vinge, "True Names" (1981)
 - Hackers adventures in virtual environment
 - Comic-book story; anti-government ideas
 - Influential on libertarian new activists of 90s

Gibson's Cyberspace

- Famously defined as "consensual hallucination" for exchange of data
- Very much like real space
 - Big mainframes are like skyscrapers
 - Valuable data is protected
 - "Walls", "gates" "mazes" of "ice"
 - Need speed, reflexes to fly through
 - Illicit programs are like illegal weapons
 - "I felt like a punk who'd gone out to buy a switchblade and come home with a small neutron bomb."
 - Death in cyberspace can be real death
- Works well for story
 - Actual function, purpose is not totally clear

Cybernetics

- Coined by Norbert Wiener, 1947
 - Popular 1948 book, "Cybernetics"
 - From Greek – "steersman"
- Idea tied to automation
 - Generalization of feedback, as control principle
 - Animals, machines – both seek goals
- Idea gets tied to Artificial Intelligence
 - Also "cyber" is popular prefix



A "cyberman" from the TV series Dr. Who

Cyborg

- Cyborg = CYBernetiC ORGanism
 - Combination of human and artificial parts in a single system
 - Popular science fiction idea from 1970s
- Intimate connection to technology
 - High tech in 1980s is becoming much more domestic & personal
 - CD player or Nintendo rather than nuclear power
 - Gibson imagines symbolic extensions
 - "jacking into the matrix"
 - Implants such as blades, communications, retinal displays
 - Hands and arm in Burning Chrome

Cyberpunk: The Movement

- First self-conscious movement since "New Wave"
 - Neuromancer (1984) is defining statement
 - Gibson & Bruce Sterling are key proponents
- Push to shake-up science fiction
 - Sterling publishes "Cheap Truth" magazine
 - Fame soon spreads beyond genre
- Largely faded as movement by late-80s
 - Influence remains strong on later work
 - Neal Stephenson's *Snowcrash* (1994) is popular

Virtual Reality

- Virtual Reality (new term circa 1982)
 - Immersion in simulated world
 - Much interest in driven by cyberpunk fiction
 - Idea spreads rapidly into mainstream culture
- Typical components are
 - Stereo, head-mounted display
 - Powerful, real-time 3D graphics hardware
 - Sensor to detect head motion
 - Data gloves to sense hand motion
- Computer industry saw as next big thing around 1990
 - Lots of researchers want to work on
 - Flurry of VR startups



VR Disappoints in Real Life

- 3D graphics make amazing progress
 - Specialist 3D hardware becomes commonplace in late 1990s
 - Used almost entirely for games
 - Nobody really figures out applications in spreadsheets, presentations, etc.
- Some real applications for immersive 3D
 - Architectural walkthroughs
 - Astronaut training, etc.
- Mainstream applications lacking
 - Immersion makes people sick
 - 3D user interfaces are harder to use
 - Nobody figures out a new interface paradigm



Hackers

- Term originally has positive association
 - geeky pranksters at MIT
- By mid-1980s means electronic vandals
 - Sometimes credited with superhuman powers
 - Media fascination continues into 1990s
- Problem for science fiction
 - Actual hacking very boring



Cyberspace in the 1990s

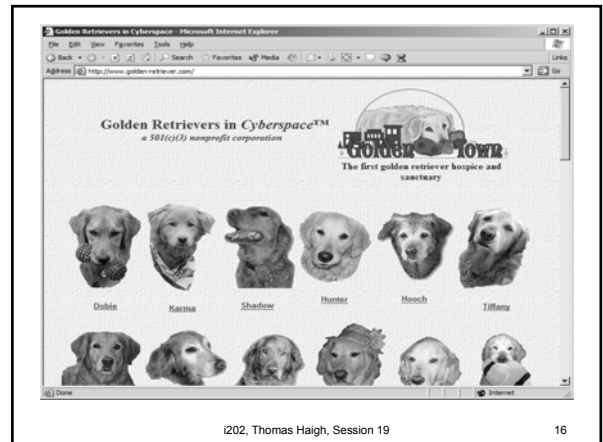
- Gradually loses association with VR
 - Becomes a description of shared social space on the Internet
- Key idea: a network is a place of its own
 - Different from prevalent idea of earlier technologies
 - Postal systems
 - Telephone network
 - These bring two or more real places into contact
 - But nobody much talks about "postalspace" as being where catalog companies are based
 - or "telephoworld" as where psychic hotlines operate

Network as a Place

- If we consider "cyberspace" as a place, it is natural for it to have its own
 - Laws and government
 - Citizens
 - Cultural norms, language and customs
 - Businesses
- The Electronic Freedom Frontier is one group pushing idea of net as cyberspace
 - They think its natural state is freedom and governments should keep out of the way

Idea Pops Up Everywhere

- Journals are published in cyberspace
- Companies do business in cyberspace
- Experts specialize in "cyberspace" law
- Politicians campaign in cyberspace
- Bush calls for "A National Strategy to Secure Cyberspace"



Very Powerful Metaphor

- Guides ideas about regulation
 - E.g. Congress bans states from taxing transactions that happen in "cyberspace"
- Guides expectations of users
 - E.g. things are usually free in cyberspace
- Ties in with "virtual community idea"
 - Various manifestos written for "netizens", etc.
 - Idea that move to net is like founding a new country

Dual Realities

- The Internet does allow real social processes
 - Of kinds previous carried out primarily in real places
 - Conversation
 - Buying and selling
 - Development of shared culture, etc
 - Though these were sometimes done by mail, in print, on telephone, etc.
- But everyone "in cyberspace" is also in some kind of real space
- This creates some fundamental tensions

One Example: Censorship

- Legal status of obscenity in US depends explicitly on standards of local community
 - When material is viewed on web, what is jurisdiction
 - State/nation of view
 - State/nation of producer
 - State/nation of web hosting firm
 - Or some new universal law of cyberspace?
- Similar issues in many areas
 - Gambling services
 - Taxation of e-commerce
 - Libel
 - Laws vary greatly between US, Britain, etc.
 - If something is published on web, where can you sue?

Another Example: Piracy

- China and Russia have weak piracy enforcement
 - Pirated CDs and DVDs freely sold
 - But importation to USA is relatively limited
- Electronic swapping is increasing threat
 - Cyberspace crosses national borders
 - Books, games readily available from Russian web servers
 - File swapping networks like Kazza bring together hundreds of thousands of people
- But music industry is fighting back
 - Subpoena identities of file swappers
 - Prosecute under US law

Many things hard to regulate

- For example, spam
 - Current laws are state by state
 - National US law is in progress
- Some offer stiff penalties
 - Jail or large fines
- Problem is enforcement
 - Spam is hard to trace
 - International enforcement is currently impossible
 - Geographical location of spammer may never even be known

More on these issues later...

- Next 2 sessions: virtual communities
 - Idea of real societies forming online
 - Early text based systems, modern games
- Later sessions
 - Issues of hacking and spam
 - Intellectual property in cyberspace
 - Privacy
 - Do rights to privacy exist in cyberspace
 - International Issues