Computer Science 1401: Lecture #4

Computing and the Military

MILITARY COMPUTING: THE IMAGE

MILITARY COMPUTING: THE REALITY

MILITARY COMPUTING AT THE MOVIES:
Colossus: The Forbin Project (1969)

Military Computing: The Image

Fail Safe (1964)

Military Computing: The Image (Cont'd)

The Terminator (1984)

*Short Circuit* (1986)

WarGames (1983)

Military Computing: The Reality

- Computing is just one of many technologies used by the military to support three key activities:

  1. Intelligence
  2. Defence
  3. Attack

- Development of electromechanical and electronic computers dramatically accelerated by World War II.

- Early uses of computing included artillery ballistics calculations, battlefield logistics and breaking cryptographic codes.

Military Computing: The Reality (Cont'd)

Harvard Mark I
(1944
Mechanical
Artillery Tables)
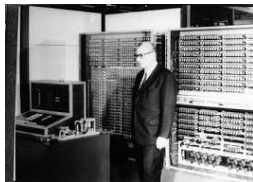
Zuse Z3
(1941
Electromechanical
Aircraft Design)

Colossus
(1944
Electromechanical
Codebreaking
(Lorentz Cipher))

ENIAC (1945)

- Performed 5000 calculations / sec; programmed by wiring.

The First Hydrogen Bomb: Ivy Mike (1952)
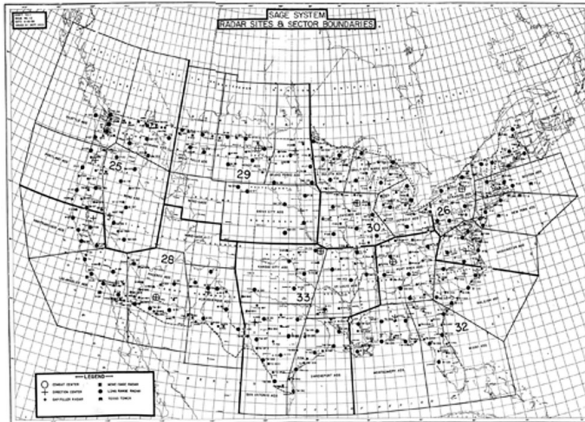
Semi-Automatic Ground Environment (SAGE)
Air Defense System

Military Computing: The Reality (Cont'd)

IBM AN/FSQ-7 (1955)

- Two dozen AN/FSQ-7 (at 250 tons apiece) used to implement SAGE.
- Was obsolete by early 1960s with advent of ICBMs.

Military Computing: The Reality (Cont'd)

NORAD Cheyenne Entrance

NORAD Cheyenne Control Room

Military Computing: The Reality (Cont'd)

Minuteman I
(1962)

Cruise Missile
(AGM-86 (1982))

Military Computing: The Reality (Cont'd)

Predator UAV
(1995)

Battlefield Robot
(2000+)

Key issue is degree of autonomy of weaponized robots.

Military Computing: The Reality (Cont'd) Cyber-War

- With dramatic increase in use and interconnectedness of computer systems, as well as their use by the military, computer systems and networks are now targets.

- Though intelligence and defence initial focus, investigations into attack potential since 1990s.

- Facilitated by undetected and exploitable flaws in commercial and military software (**zerodays**).

- Many known attacks, e.g., Balkans (1997), Iraq (2007) [Stuxnet virus], Estonia (2007), Georgia (2008), France, USA, and Ukraine (2017).

- New activity ("Exploitation") is effectively peacetime attack.

Military Computing At The Movies:
Colossus: The Forbin Project (1969)

"A SHOCKER! FASCINATING!"
–*New York Daily News*

...OBEY...OR...
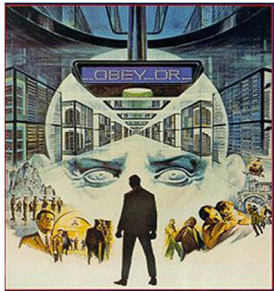
THIS IS THE DAWNING OF THE AGE OF
COLOSSUS
THE FORBIN PROJECT

ERIC BRAEDEN · SUSAN CLARK · GORDON PINSENT
Co-Starring
Screenplay by JAMES BRIDGES · Based on the Novel "Colossus" by D.F. JONES · Directed by JOSEPH SARGENT
Produced by STANLEY CHASE · A UNIVERSAL PICTURE · TECHNICOLOR® PANAVISION® [GP]

- Based on 1966 novel by D.F. Jones.
- Release of movie delayed by success of *2001: A Space Odyssey* in 1968.
- Focus on perils of military system autonomy.
- Uncommonly fair treatment of the military.
- Features famous NL actor in early movie role.

Computing Movie Cliches
(#3 in a Series)

Ihnatko's Law of Voice Recognition: *A computer sufficiently advanced to allow real-time voice communication between itself and a human will nevertheless speak like a drunk who has just received a serious blow to the head.*
  - Andy Ihnatko (in Ebert (1994))

Oscilloscope Fantastic: *Test instruments are used to display Lissajous figures, sine waves or other meaningless curves and lines to suggest that something mysteriously technical is happening in the laboratory.*
  - Charles Peklenk (in Ebert (1994))