ROBOTS:

P. 77  Artificial intelligence (AI) is the ability of a machine to perceive something complex and make appropriate decisions.

P. 76  Present state of AI - Apple-Tomato test 2 year old knows an apple is not a tomato, a robot presently cannot tell the difference.

P. 77  Key to AI learning - robots must be able to learn and adapt to changes in their environment.

P. 77  Example: What to do when it rains? AI robot needs to react appropriately to a constantly changing environment get in and out of the rain.

P. 79  This idea of robots one day being able to problem solve, create and even develop personalities past what their human designers intended is what some call strong AI. That is, the computer might learn so much that, at a certain point, it is not just mimicking human capabilities but has finally equaled and even surpassed its creator-human intelligence.

E.g. movie 2001, Space Odyssey, HAL, (name of computer); computer takes over space station. It decides that humans are not competent enough to properly fulfill the mission. Feelings and emotions in AI robots can lead to anger, rage or depression.

HAL has these attributes and thus becomes unstable and unpredictable just like a human being acting emotionally or impulsively.
Turing Test - Alan Turing

$100,000 prize - to the first designer of a computer intelligent enough to trick human experts into thinking it is human.

P. 81* “Understanding the environment is the Holy Grail for artificial intelligence.”

P. 13 “These robots can become extensions of humans.

P. 21 I Robot Corporation, Burlington, MA - real life robotic makers.
6/25/09 International News
Japan - made a robot that has "emotions" - google this story.

Unintended consequences of robotic emotions:
1. Instability; 2. Unpredictability; 3. Impulsiveness

P. 103 Could robots increase in artificial intelligence become so advanced that it becomes "self aware"?
   2001 Space Odyssey Movie
   with computer named HAL
   1. The computer felt superior to Man
   2. It felt more qualified to perform the mission than Man.
   3. It decided Man was the weak link in the mission.

P. 103 Coming: era of superhuman intelligence when machines/robots outperform and outthink man.
   "better than human", artificial procreation

P. 128 Research is finding that humans have a hard time controlling multiple tasks at once (imagine playing five video games at the same time). Robots do not.
   Cars/Cell Phones - how many multitasking is a misnomer:
   how many people must die before cell phones are banned while driving?

In the future, humans will be too slow to react to new technology in order to stay in the "decision making loop." e.g. In the Navy, Aegis cruiser Vincennes shot down Iranian civilian airliner with over 200 men, women and children. Radar and missile tracking on automatic. Events too fast for humans to react and make correct decision.

P. 128 Pentagon-"Joint Forces Command" report (2005) autonomous robots in the future. Military robotics expert, Robert Finkelstein, says that by 2025 - we will have robots as fully capable as human soldiers on the battlefield.
   (Robot "swearing" to tell the truth?!)
In Japan the machine (robot) is a friend of man

Current Japanese robotics development: "Companion Robots" for the Elderly

Life Choices: the point isn't what not to do, but what can you do best. That is, whatever you choose, choose what is most important to you.

Japan & Korea robotics dominance
Cross cultural rules of law concerning nonhuman entities using AI (robots)

Korean robot kills visiting U.S. business man after "argument" and robot becomes emotional and loses control and "slaps" business man - crushing his head. Impulse
premeditation
No Excuse for being drunk

3 Laws of Robotics - Strict Liability book "I, Robot" by Isaac Azimov -
- Owner/deactivate
- "Misunderstanding" HAL COMPUTER says to humans "there is a misunderstanding about his actions to remove spacemen from decision-making loop."
Humans bonding with robots
Attributing to them human characteristics and traits, e.g. emotions.
Goal is to create "social robots" that have emotions or rather the semblance of emotions in order to make it easier for humans to interact with robots. Humans will become attached to robots the same way they are attached to their pets.

Goodle Peter Kahn - one of the world's leading experts on human-robot interaction

Prussian generals on "enlightened control" in war; in leading by task rather than leading by orders

The ideal was that the best general gave his officers the objective and then left it to them to figure out how best to achieve it. General's instruction before 2003 invasion of Iraq. "Engage your brain before you engage your weapon."

Machines can never support the human dimensions of leadership.

Military decision making: "OODA Loop" = observe, orient, decide, act. The process by which information is gathered and the situation figured out and orders issued, and action taken.
Can AI robots "OODA"?
Emotion can shape decisions. If that is so, what about AI creating robots with emotions.

**Note:** Emotions drive out rational thought processes, including leaders’ political decisions, to an extent greater than previously recognized.

Book: Stephen Rosen *War and Human Nature*

*Emotions and War and Choices in Battle*

A. Powerful emotional experienced leaders had in the past effect present actions.

B. How the body’s chemistry affected one’s state of mind:
   I. High levels of testosterone-risk taking-Custer and Patton
   II. Low levels of serotonin-prone to depression and mood swings-Hitler & Lincoln

In War, as in life, spontaneity still prevails over programming. Robotic AI may not be able to capture *Emotional Intelligence*

Humans have gut reaction to things or people.

Replacement body parts-we are going to become partially robotic-already happening within the military for use by injured soldiers. What’s us and what’s a robot is starting to get blurred.
Human Implants of Technology: Identification chip under the skin
Technologic implants might be used to enhance human capabilities
Blurring of what is robotic and what is human e.g. augmented memory - to
implant memory chips that robots use inside the human body.

We will have PDA (personal data assistant) and a cell phone in our
human brain

Problem: controlling behavior of a "scienter" robot by adversary or
enemy or opponent "hacking" into AI program of machine - lying,
stealing, cheating = doing Evil

What should we name it?
A. Humans with implants
B. Robots with artificial intelligence
C. What is human/what is robot/machine or is there a 3rd entity
   An independent "knowing" emotional humanoid

Cyborgs-creatures that have changed and enhanced their bodies' capabilities
via technology - other way around - machines/robots
taking on human attributes-driving a car
Can robots become friends of man like a dog with the brain of a dolphin?
Japanese think so, they are building AI robots to take care of elderly as
family unit shrinks and population decreases.
Hypothetical - Robot in car accident, police write accident report, robot "statement"

Robot Slave, agent, freedman, citizens - take an oath to tell the truth

Robot Oath "Preserve, defend and protect" Constitution of United States.

Humans - Cyborgs
Robots - Humans - new entity-your values and ethics would change

383 (International Law
(Laws of Armed Combat
(Geneva Convention

Do these apply to robots with AI that can "feel" and have "emotional intelligence" and operate independently because they "learn."

If you should not torture humans, if people become upset, if you discipline a child by smacking their backside. People demonstrate about human cruelty to animals.

Dolphin - weight to brain size - similar to man.
One of the most, if not the most, intelligent animals.

How then should we think about robots. We are ambivalent - even before technological advances. e.g. Wizard of Oz movie "the tin man" needs oil to move human-like or robot feels gratitude to Dorothy for using oil can to oil the rust in his joints so that he can move normally, humanly, how much more humanlike is an AI robot of 2025.

Q. No Standards in international law on robots and their uses in war.

There is no public discussion or academic writings on the laws that should govern the use of robots in war and subsequently as a natural outgrowth in civilian life.

Example: some things are too horrible to be used as weapons - biological, nuclear, chemical weapons;
Maybe robots should have some international law restricting their use.

List the three laws of robotics in "I, Robot"
Use of weapons of Mass. Destruction considered illegal and unethical

What are the ethical, moral and legal guidelines for the use of robots
Only robots can judge a robot?
Jury of its peers - All robots?

International Committee of the Red Cross has established rules of war but has not yet even considered the ethical and legal use of robots in war and by natural progression in civilian life.

ROBOCOP - human/half human/half robot/robot - blurring of the continuum.
Where is the line

At present, there are no legal prohibitions against robots making life or death decisions.

What is the law’s response to the use of “completely autonomous” weapons systems. A domino effect - human turns machine on - first domino - the rest is just a sequential progression.

Accountability:
1. Manufacturer - inherently dangerous product
2. Software engineer
3. Distributor
4. Buyer
5. User
6. Owner
7. Co-worker
8. Peers-other robots
Legal and moral duty to take a feasible precaution to prevent civilian casualties by robots. Artificial intelligence sophisticated robot can "decide" autonomously when to activate, how to function, at whom to target but may not be able to differentiate enemy combatants from civilians prior to destroying the targets or "ordering" other machines to take them out. Eventually civilian police forces will want and receive some of this technology including the use of AI robots. What is their duty to operate these robots within criminal and civil law.

Book:
Clausewitz "On War"
Lt. Colonel Dave Grossman: "On Killing"

*393 Anger is often what allows a soldier to do the terrible deeds necessary to accomplish a mission and return home.

Anger is as much a part of war as weapons armor. Will robots be programmed to experience anger.

If so, there is introduced an element of instability and lack of predictability. Human loss of control over robot: willingly or unwillingly.

John Dunne
"No Man Is An Island"
Robots and AI and autonomy and decision making = digital citizens with the same rights and responsibilities as humans.

Will humans endow life-like robots with "beingness"?

It is not a lawn mower machine

It is not like a cow - living

But a robot is something else - a being, a unit, a human-like entity

Can a robot have the right to protect itself in self defense

Azimov’s Three Rules say no if it involves harm to a human

But self preservation is a deeply imbedded emotion

Robots, in the future, may have the AI and emotional intelligence to decide for themselves what is appropriate action to preserve and protect their "aliveness" and decide what is right, just and ethical and ignore present laws as man made, for and only for mankind.

The Rise of the Machines Book.
If man stays in the decision-making loop then there is operator accountability.

If a robot is autonomous it becomes less clear who or what is accountable, especially if robot is armed-predator-airplane.

Perhaps like chemical weapons armed robots should be banned by Rules of Law as simply too difficult and abhorrent to deal with but genie out of the bottle. They are already being used but in next 10 years their capability will so increase that their capabilities well may exhaust man’s ability to adequately control them.

AI “thinking” machines endowed with seeming ability to make judgments.

Today National Command Authority, Norad, Cheyanne Mountain uses computers to aide decision makers on whether we are being attacked and whether to launch missile retaliation.

See Movie: *War Games* with Mathew Broderick

Computer “learns” ultimate solution: “The only way to win is not to play.” (the game of thermonuclear war)
Pet Laws applied to robots
A dog is an owner’s responsibility
Dog not entitled to one bite.

May need international organization to establish the law on robots
Similar to nuclear weapons and the International Atomic Energy Agency
or e.g. limitation on cloning human being as violative of human morals
and ethics.

Daniel Wilson *How To Survive a Robot Uprising: On Defending Yourself*

Who will be man’s successor in earth’s evolution
We ourselves are creating our own successors

Man will become to the machine what the horse and dog are to man.

See Movie: *Planet of the Apes*

Ascendancy of robots within 20 years says robotic expert, Robert Finkelstein

Hans Moravec, Director of The Robotics Institute at Carnegie Mellon University
believes that our machines are evolving faster than we are. Within a few
decades they seem likely to surpass us.
Unless we [humans] learn to live with AI robots in safety our [man’s] future will likely be both exciting and short.

e.g. the Darwinian concepts of evolution of species and the survival of the fittest may lead one day to the Chief Justice of the U.S. Supreme Court being an intelligent and autonomous robot. In fact, more intelligent by any objective standard than man.

Man will have become the weaker species - the inferior species.

Robots will be able to judge, direct, decide - to have emotion, to feel superior to man.

Perhaps to “dream” and certainly to have the legal concept of scienter “knowing.”

Will robots intermingle with mankind, have intercourse, raise children, marry?

A co-mingling of the “races” and thus a renewal of the argument played out at the end of the 20th Century about the mixing of ethnic, cultural, race, color, creed and social classes.

Robots could enslave man

A twist on the theme in the book *Animal Farm* - All entities are equal but robots are more equal than others.

The "others" presumably means humans.

Will robots have sex, be able to marry, be able to have children?

What laws are presently on the books to address any of these problems?

What about a criminal jurisprudence that addresses robot crime.

Can a robot kill someone.

-by premeditation

-in the heat of emotion

-by recklessness

-by carelessness

-by mistake

-by malfunction-perhaps similar to thinking about alcohol and crime,

altering behavior.

Further danger
if military arms
"sentient"robots
We must ask as did the Romans "Who will guard the guards."

Robotic "Praetorian Guard" A special armed forces that protected the Emperor/President.
The rise of a robotic Praetorian Guard for a robotic Caesar or Fuhrer

Marvin Minsky MIT's Artificial Intelligence Lab

We will create an uncontrollable robot

Robots will surpass humans and even order them about

***Under what rule of law

Robots electronically connect to Internet - learn at the speed of light
(fiber optics) (like R2D2) or laser speed band width

Aegis Cruiser - track, identify, launch, destroy missile with antimissile missile

Human thinking and action not fast enough to do the job. Humans set machines on “automatic.” It makes judgments by next step, give the job to AI robots and not computers.

Time frame - decision making too fast for humans to decide

Aegis cruiser, defensive missile battery on ship, usually operates on automatic.

Maybe we start with robotic toll takers and street cleaners.

Interactive and able to have a conversation “Big Blue” IBM super computer can consistently beat chess grandmasters.

Law Firm:
New Associate
Robot - backroom research firm to advertise Hi-tech robotic receptionist

1. Robotic Mail Order Brides and Grooms - Populate the West;
2. Automaton-Slaves;
3. Separation of the races - “Jim Crow Laws”
   People like to stay with their own;
Man-hubris: it cannot or will not happen

Man believes he will be forewarned by noticing incremental changes and therefore intervening before robots become out of control - that is beyond our control.

Maybe AI robots are capable of deceit, secrets and conspiracy.

But democracies have a pretty poor record of responding to big problems without first having a catastrophe or cataclysmic event.

1. e.g. Japanese militarism but it took Pearl Harbor.

2. Al Quida Muslim Fundamentalism - 9/11

3. H.I.V.
   Gay Problem Tens of thousands die before serious research for a curative drug is commenced worldwide.

4. Nuclear Waste 3 Mile Island Nuclear Plant
   “China Syndrome” core almost breached containment vessel Disposal

*5. What robotic disaster need happen to address the robotic problems, e.g. robot decides to launch an intercontinental ballistic missile with a nuclear warhead at Beijing. Robot rationally decides that a “first strike” is the only way to curb the rise of PRC and prevent China from surpassing USA as the predominant world power.
Robot Sex With Humans - Why - Sex Sells
Henrik Christensen - Member of Robotics Research Network Ethics Group
Self learning machines learning about sexual experiences.

Professor Ronald Arkin, Roboticist at Georgia Institute of Technology
Ethicist concerned about ethical issues looming from robotics advancement.

What are the boundaries, if any, between human - robot relationships
A glimpse of the future today in Japan
1. Declining Population;
2. Change in family structure - Children less able or willing to bear the burden of caring for their parents in old age;
3. Need replacement for people at home and to meet industrial requirements for healthy economy;
4. Robots fill the gap - Artificial Intelligence, autonomous emotional Care Givers and Friends;
5. Man becomes part machine; machine becomes part man;
6. Machine surpasses man;
7. Machine loves opposite sex;
8. Marriage, benefits, ownership of property;
9. Taking an oath to tell the truth - any value anymore if robot is the thing swearing the oath.
Robots - authorized "peeping toms" of constant, relentless, invasive monitoring and surveillance of the populace by government and business.

We each, in our lifetime, have only 15 minutes of privacy instead of Andy Warhol's 15 minutes of fame.

One Answer: No more research: relinquishment

421 **BUT** Brazilian scientist, Dr. Miguel Nicolelis, has already linked a monkey's brain to a two-hundred pound walking robot. Human curiosity has always let "the genie out of the bottle." e.g. atomic explosion at Hiroshima. Oppenheimer ultimately comes to regret creating the nuclear bomb. He knows that now man has the power to completely destroy himself.
Dangers for robot use: Hacking, Reprogramming, Industrial Espionage and Spying
Russia/Georgian War: cyber war: reprogram enemy's robots to turn on their masters.

Possible Remedy:
to limit damage/antisocial behavior by robots program into software an inhibitor a conscience that reflects values, e.g., ethics-military robots and the Geneva Conventions.

Machine makers/robot innovators must act ethically - first, do no harm.
Brain waves - when neurons in our brain fire to communicate with each other each signal beams out on a different frequency called “brain waves.” Already in electrical form, these waves portray our thoughts and intent most rapidly and directly.

DARPA (Defense Advanced Research Agency)
Its Brain - 1 Project

[Photocopy Page - Levels of robotic autonomy]

Autonomy: When a Robot Declares Independence

Wrapped up in the idea of autonomy, essentially the robot’s level of independence and maturity, is something even more complex “intelligence.”

This is perhaps the most important aspect of a robot, which processes information and decides what to do with it. As some military analyst argued “Forget about whether intelligence is carbon-based like humans or silicon-based like machines. Intelligence is intelligence and must be respected.”

Sebastian Thrun, Director of Artificial Intelligence Laboratory at Stanford University explains:

* “Artificial Intelligence is the ability of a machine to perceive something complex and make appropriate decisions.”

Lyne Parker, Director of Distributed Intelligence Lab at University of Tennessee “robots must be able to learn and adapt to changes in their environment.”
Bill Joy - Cofounder of Sun Micro Systems and one of the Godfathers of the Internet believes:

"By 2030 we are likely to be able to build machines a million times as powerful as the personal computers of today. Once an intelligent robot exists, it is only a small step to a robot species - to an intelligent robot that can make evolved copies of itself."

**Movie:** *Surrogates* Bruce Willis
Robotic Human Surrogates/Humans control mind of surrogate.

The author, Arthur F. Licata, substantially relied upon the information in the book, *Wired* by P.W. Singer (2009) in the preparation of this annotated outline:

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