Artificial Intelligence with a focus on practical applications.

Practical Applications of Computer Technology
Information Systems

AI Languages

AI/Intelligent Systems

 Perception — vision, speech
 Natural Language Processing — understanding, generation, translation
 Commonsense Reasoning
 Robotics
 Game Playing
 Mathematics
 Expert Systems
 Learning
 Intelligent Network Agents (Softbots)
 Semantic Web
 Decision Support Systems

Decision making

Real-World Applications
 How to implement these concepts

Also

1. Planning
 2. Learning (symbolic, neural networks)
 3. Constraint Satisfaction
 4. Game Playing
 5. Robotics
 6. Natural Language Processing — understanding
 7. Perception — vision, speech
What is AI?

Artificial intelligence (AI) is the design and study of computer programs that behave intelligently. These programs are constructed to perform as would a human or an animal whose behavior we consider intelligent.

Dean, Allen, and Aloimonos

Artificial Intelligence (AI) may be defined as the branch of computer science that is concerned with the automation of intelligent behavior.

Luger and Stubblefield

Approaches to doing AI

Symbolic
Non-symbolic
PDP neural nets, connectionism
Situated Action

Approaches to thinking AI

Humans that act symbolically
Humans that think symbolically
Systems that think like humans
Systems that act like humans

Definitions of AI

Systems that think like humans
Systems that think rationally
Systems that act like humans
Systems that act rationally

Russell and Norvig
My Interests

1. Automated Reasoning
   ▶ modal logics
2. Knowledge Representation and Reasoning
   ▶ actions and their effects on the world and on the knowledge of agents.
3. Computational Linguistics/Cognitive Science
4. Agents, Semantic Web
5. Agents, Semantics

Deduction

1. Janet likes anyone who is rich.
2. Programmers are rich if they use Prolog.
3. John is bald.
5. John is a programmer.
7. Fred is a man.

Does Janet like John?

Java

Development began in 1991 within Sun Microsystems as a language to be used for small consumer devices.

▶ Java Language Specification
▶ Java FAQ
▶ Java White Paper
▶ http://java.sun.com/docs/books/tutorial/index.html
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Java was first demonstrated in 1995 and then released in 1996.

▶ Java was first demonstrated in 1995 and then released in
▶ Project Greenfield into a language for the Internet.
▶ Language to be used for small consumer devices.

Development began in 1991 within Sun Microsystems as a language to be used for small consumer devices.

▶ Java

Texas

1. Janet likes anyone who is rich.
2. Programmers are rich if they use Prolog.
3. John is bald.
5. John is a programmer.
7. Fred is a man.
8. Fred is rich.
9. Jan is rich.
10. Fred is a chauvanist.
12. Janet likes anyone who is rich.

Is Fred a chauvanist?
Java Characteristics

- Simple
- Object Oriented
- Distributed
- Robust
- Secure
- Portable
- Interpreted
- High Performance
- Multithreaded
- Dynamic
- Dynamic

Java Example

```java
class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello, world");
    }
}
```

```bash
> javac HelloWorld.java
> java HelloWorld
Hello, world
```

Applet

```java
import java.applet.
import java.awt.

/** This applet just says "Hello World! */
public class FirstApplet extends Applet {
    // This method displays the applet.
    // The class that does the drawing is called Graphics.
    public void paint(Graphics g) {
        g.drawString("Hello World", 25, 50);
    }
}
```

```
<APPLET code = "FirstApplet.class" width=150 height=100>
</Applet>
```
```java
class Fibonacci {
    /** Print out the Fibonacci sequence for */
    /** values < 50 */
    public static void main(String[] args) {
        int lo = 1;
        int hi = 1;
        System.out.println(lo);
        while (hi < 50) {
            System.out.println(hi);
            hi = lo + hi;
            lo = hi - lo;
        }
    }
}
```