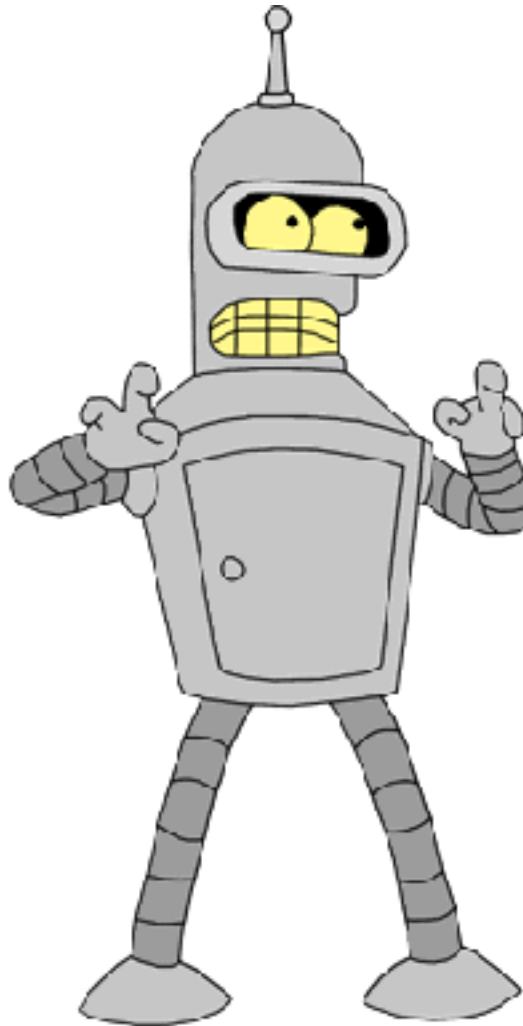


Artificial Intelligence

Artificial Intelligence



Artificial Intelligence

Study and design of machines that can think like a human being

Attempt to understand human intelligence

Artificial Intelligence

But *how* do you define intelligence?

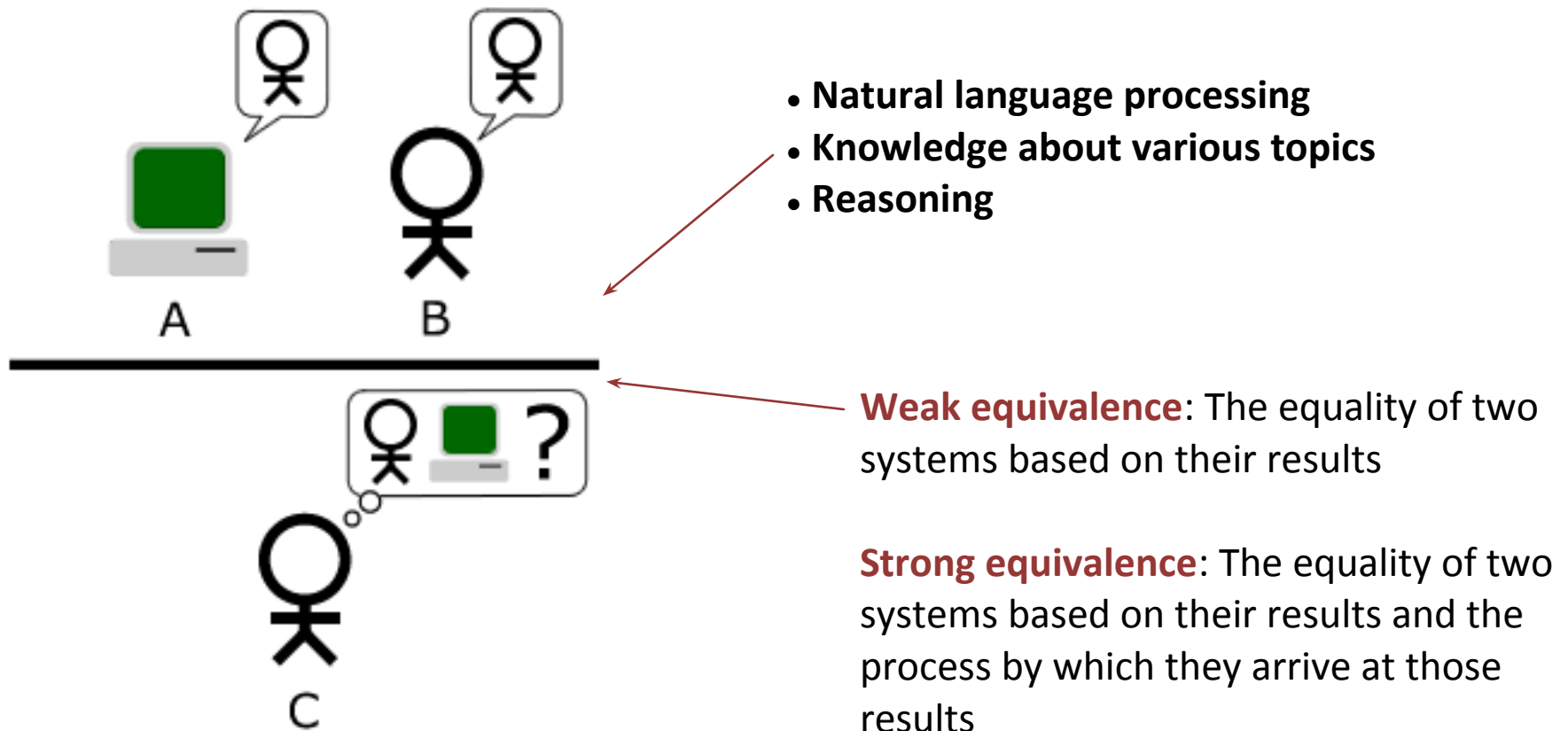
Umbrella term

Abstract thought, understanding, communication,
reasoning and learning, planning and problem solving

Goal: understand primary issues involved and the
challenges

Example: Turing Test

A behavioral test to determine whether a computer system is intelligent



Foundations of AI

Psychology

How do humans and animals think and act?

Computer Science/Engineering

How to build an efficient computer system?

Linguistics

How does language relate to thought?

Data Sources

Natural language

Mathematical notation

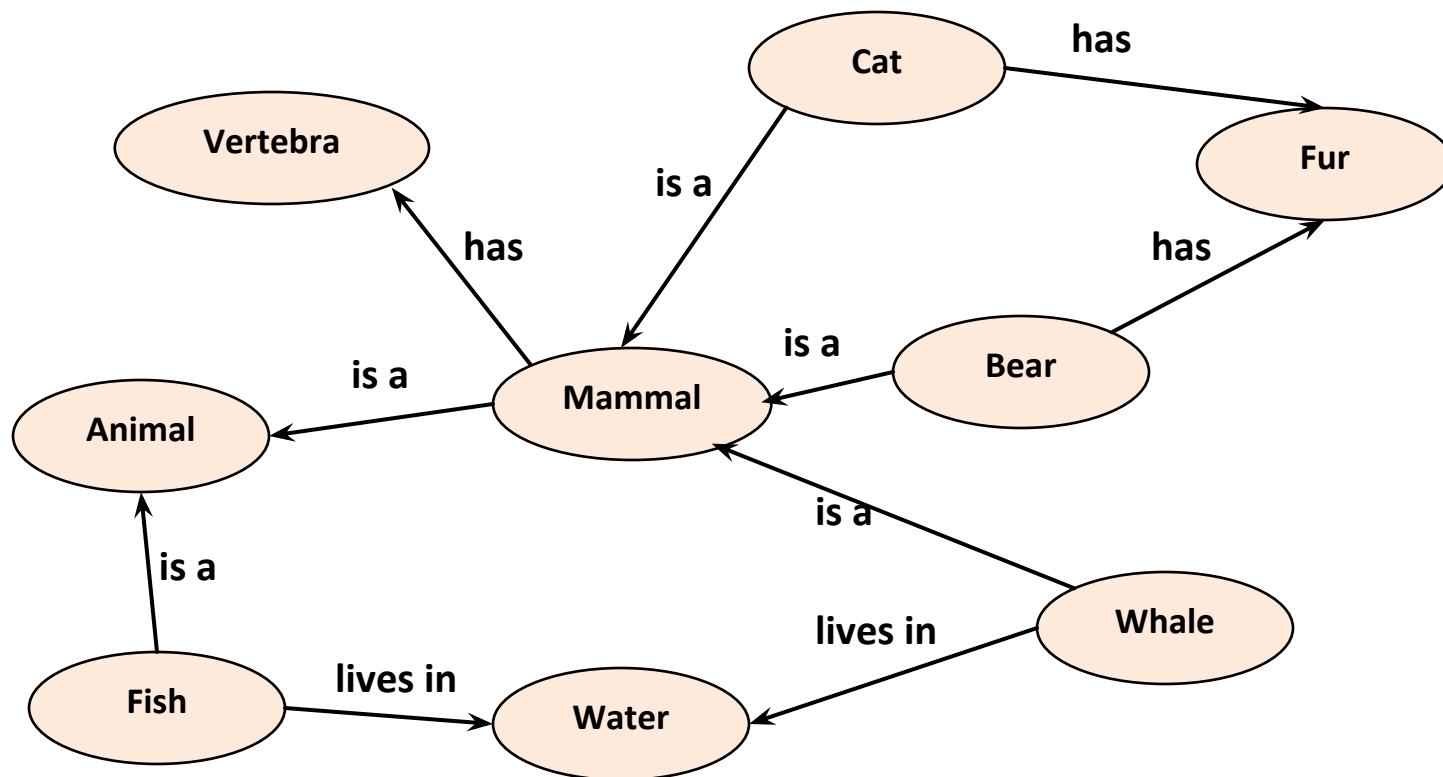
Imagery data

Written text

Music

Semantic network

A graph or network that presents meaningful relationships among objects/concepts



Thought Question

Think of **five** questions that you might issue as the interrogator of a Turing test. Why would a computer have difficulty answering them well? Please explain your reasoning.

Search Trees

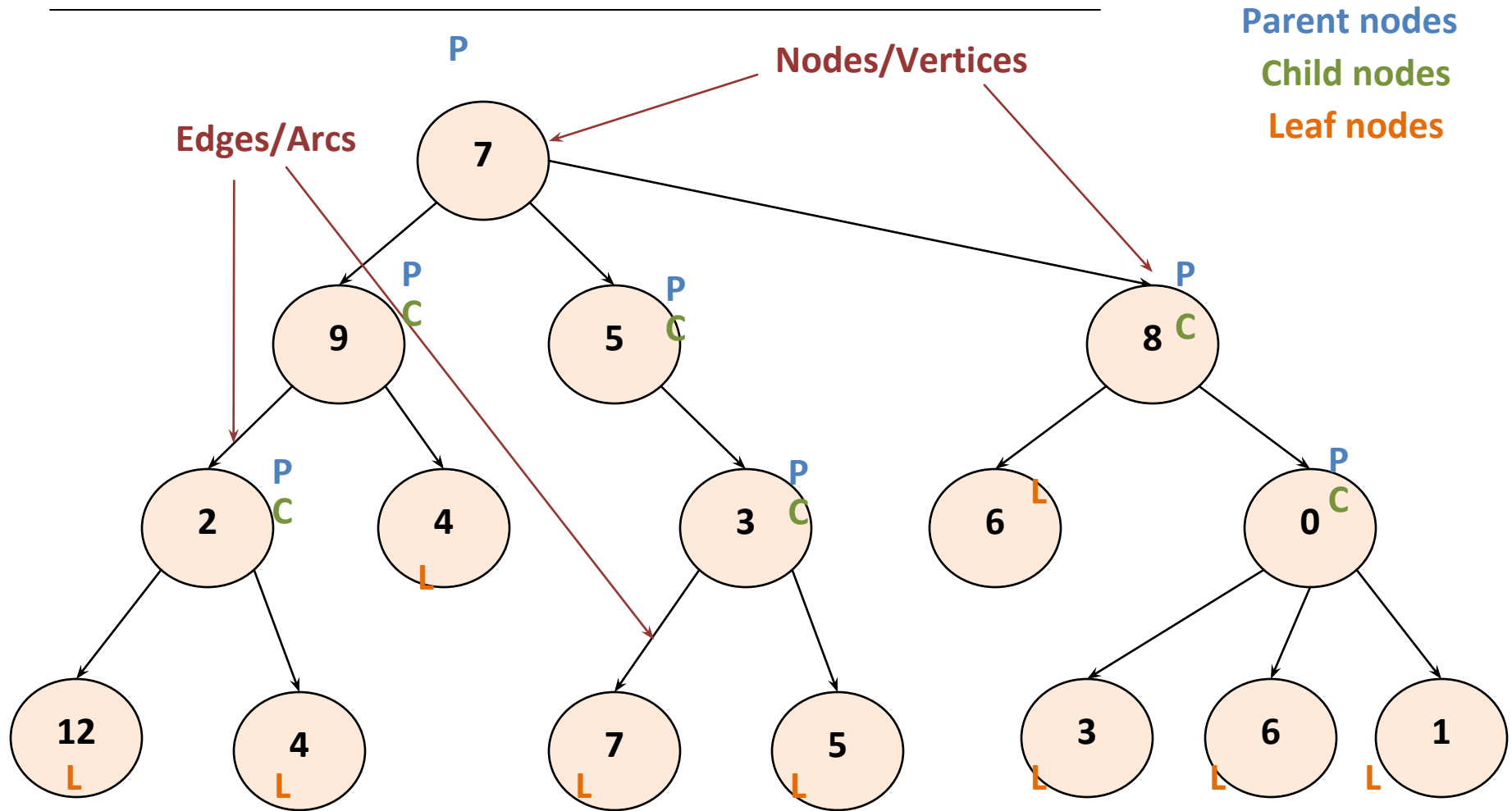
Hierarchical structures that represents the alternatives of situations/choices

Nodes/Vertices: Points in a tree that contains some form of data

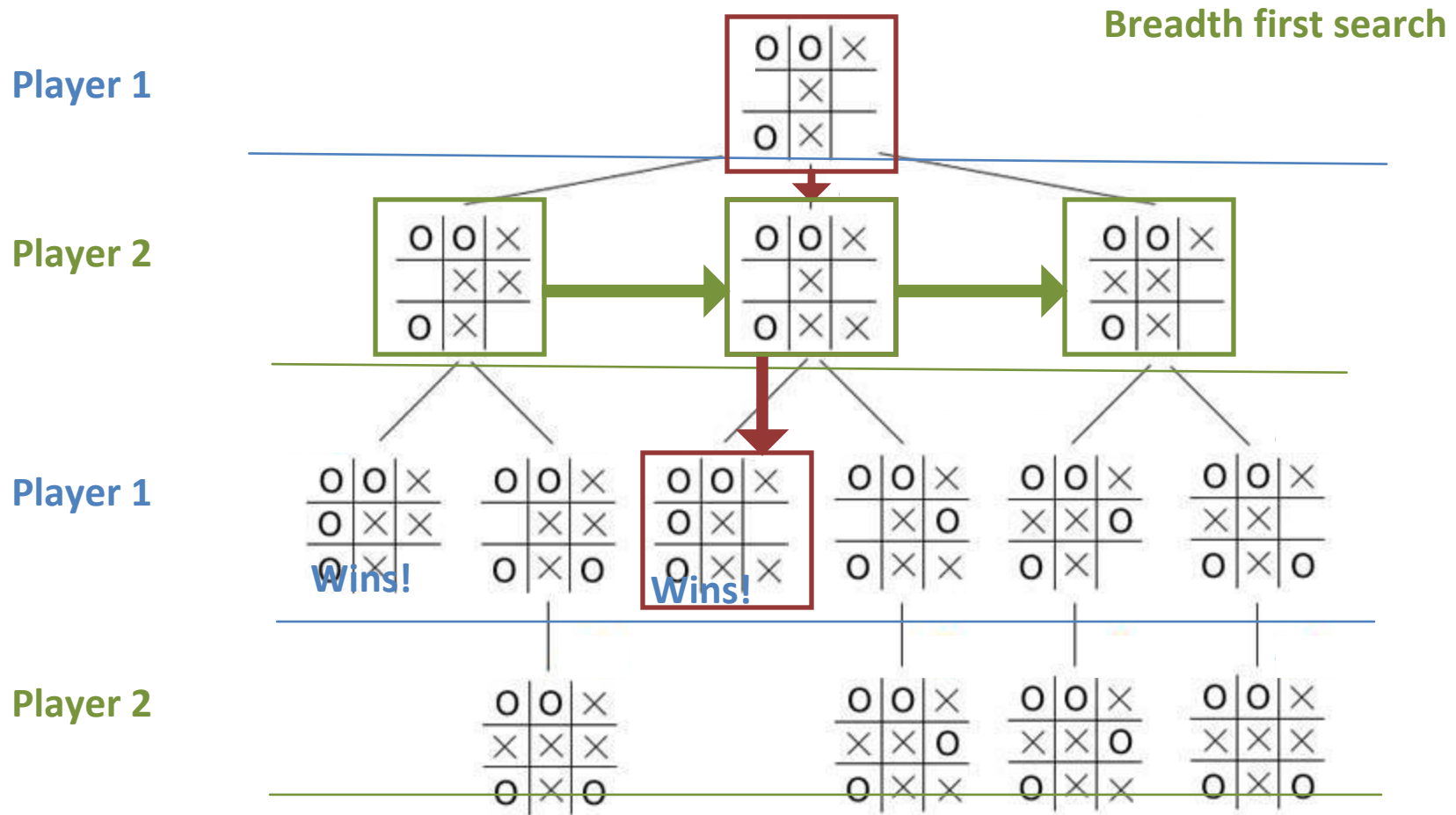
Edges/Arcs: Link between nodes in a search tree

Game tree: is a graph whose nodes are the positions in a game and whose edges are moves

Search Trees



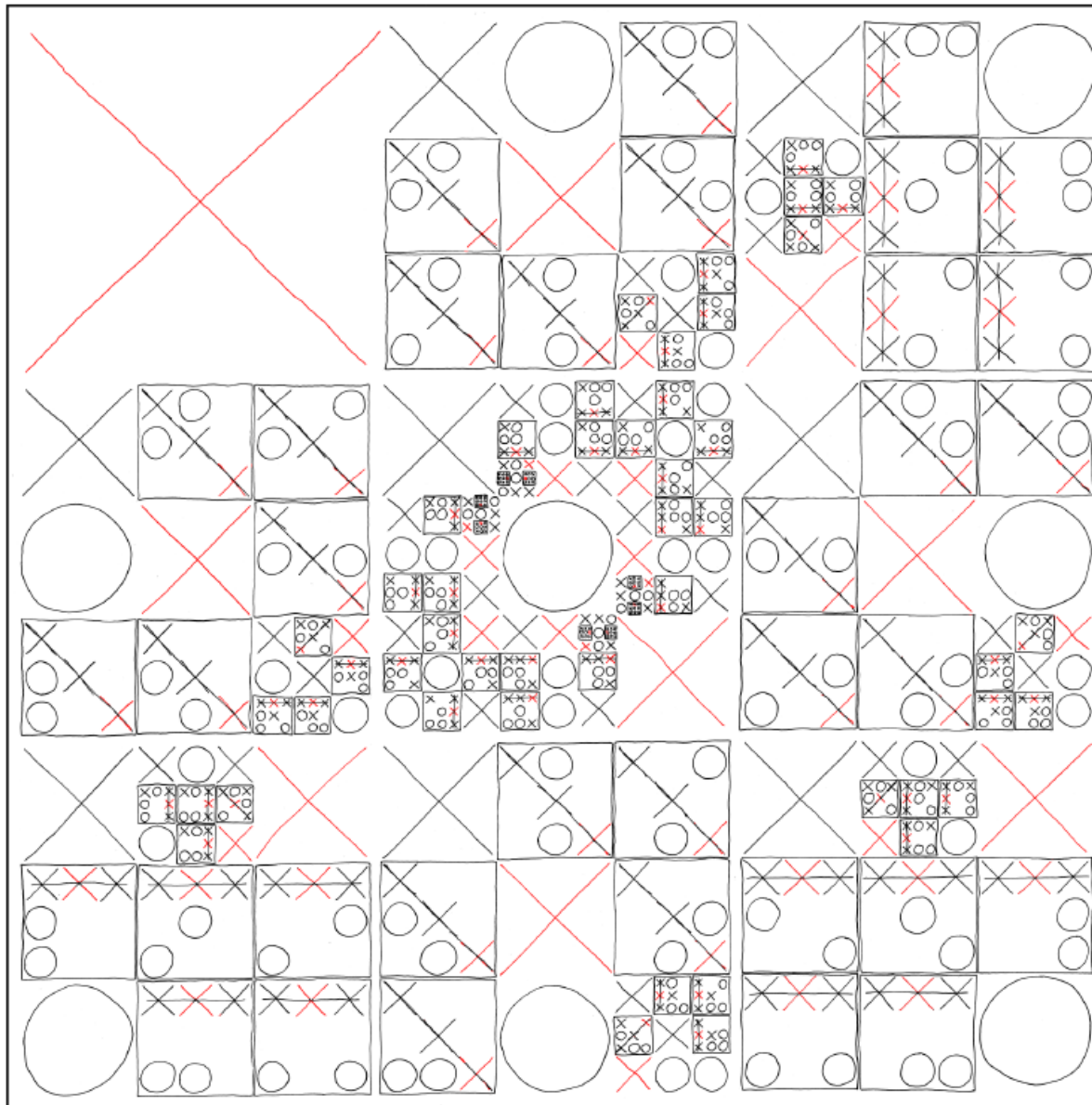
Game Trees



COMPLETE MAP OF OPTIMAL TIC-TAC-TOE MOVES

YOUR MOVE IS GIVEN BY THE POSITION OF THE LARGEST RED SYMBOL ON THE GRID. WHEN YOUR OPPONENT PICKS A MOVE, ZOOM IN ON THE REGION OF THE GRID WHERE THEY WENT. REPEAT.

MAP FOR X:



A* Search

State of the art method in searching a tree

A "Greedy" and "Best First Search" method

Each possible next node in a graph is considered based on a heuristic (guess of future cost) and current cost.

Simple yet powerful

Visual Example

http://upload.wikimedia.org/wikipedia/commons/5/5d/Astar_progress_animation.gif

