**Motivation:**

- Games have been played for a millennia.
- Wall paintings over 5000 years old have been found in Egypt.
- People are playing the same games they were back then, but only now, are we able to strongly solve them.
- The GamesCrafters research and development group was formed to explore the fertile area of combinatorial and computational game theory.

**Games We Solve:**

- Two players (Left & Right)
- No chance, such as dice or shuffled cards
- Both players have perfect information
  - No hidden information, as in Stratego & Magic
- The game must be finite - it must end

**Moves / Positions:**

- **Winning Move:** Either wins the game, or leaves opponent with losing moves.
- **Losing Move:** Either loses the game, or leaves the opponent with winning moves.
- **Tying Move:** Either makes a tie, or leaves opponent with tying and losing moves.
- Using these definitions:
  - **Win:** A position in which there exists a winning move.
  - **Lose:** A position in which all moves are losing moves.
  - **Tie:** A position in which all moves are tying and losing.

**Research Projects:**

- **Maximization:** An iterative, parallelizable, retrograde solver, which can use optimized level files of actual positions visited to optimize the search
- **ODeepaBlue:** A parallelization architecture that utilizes cluster computing and Map-Reduce programming paradigm
- **GUI high-resolution resizeable skins, delta remoteness, visual value history, game tree traversal, solving progress bar, true game size, redo, and load save games**
- **Network play with eHarmony pairing and network database server**
- **Bit-perfect and zero memory DB access**
- **Open positions and analysis database, with game graph visualizations**
- **Generic game libraries and GUI language**
- **Game histories and taxonomies researched, and an auto-updated web site with current analysis results**
- **Goldification:** GUI upgrade to Change!, Ice Blocks, Wuzhi, Mancala, Mu Torore, Nim, Queensland, Tac Tix, Rubik’s Magic, Dino Dodgem, Lite-3, Chung Toi, Othello

**How We Do It:**

The value of a game is determined by a brute-force exhaustive search of the game tree. The value of a particular board configuration, or position is based on the values of its children, i.e., the positions that are one legal move away. A position has a value of either Win, Lose, or Tie. Moves are also labeled with one of these three values.