Definition

Metagaming is match-independent game processing, i.e. game processing that is done independent of any particular opponent or any particular state.

Objective of metagaming - to optimize performance in playing specific matches of the game.

Usually done offline, i.e. during the startclock or between moves or in parallel with regular game play.
Examples

Boring:
Headstart on Game-Graph Search
Endgame book

Statistical:
Machine Learning

Structural:
Change of Framework (e.g. state machines to propnets)
Game Reformulation (e.g. game decomposition)

Engineering:
Compilation (machine language, fpga’s)

Headstart

Incremental Search techniques allow a player to begin searching even before the game begins.

It is as if, for the first move, the player can think for playclock + startclock seconds.

Haley Technique - set it up in a separate thread and have it running all of the time.
Endgame Book

Startclock:
Starting from terminal states, work backward to states that lead to those states, storing scores and best actions (universal plan).

Runtime:
Use cached score in search. If your player is forced into one of these states, it simply performs the best action. In either case, no further search is necessary.

Useful when there are few goal states and when backward branching is lower than forward branching. Problem - finding end states and backing up.

Machine Learning

Example - Comparative Analysis of Heuristics

(1) Select heuristic (e.g. mobility, focus).

(2) Play random games using that heuristic for self, compute mean terminal value, assign that value to the heuristic.

(3) Compare values for different heuristics to select coefficients in weighted linear evaluation function.
Structural Analysis

Methods discussed so far take time proportional to the size of the game graph.

Game descriptions with smaller representations possible.

In some cases, analysis can be done in time proportional to these smaller game descriptions.

More on this in the weeks to come.