# Evaluation, Search, Planning, and beyond

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## Current Research Interests

- **Evaluation Function Learning**
- Selective Search
- **Generic Game Server**
- **AI for RTS Games**

## Evaluation Function Learning

- Assessing state values
- Guiding search
- Tuning numerical parameters is often easy
- Where do features come from?
- Idea: inductive feature generation + regression
- Can be directly applied to domains with limited abstraction (e.g. Othello)
- **Plan: Model Enhancements, more applications**

## Generic Game Server

- Players and game services connect to central server
- **Meeting venue** for games researchers, programs, and players
- **One GUI** for all games
- Currently just board games:
  - Ataxx Checkers Chess Dots-and-Boxes Domineering Go Hex Othello PhutBall
- Plan: Enhance C++ class hierarchy, port the applet to C++

## Real-Time Strategy Games

- Very popular PC games. Million-sellers!
  - –WarCraft, StarCraft (Blizzard)
  - –Age of Empires (Ensemble Studios)
- Players set up **economy**, build **armies** and struggle over **resources** in a 2.5D world in real-time.
- Problems: **weak AI + commercial servers**

## What makes RTS games hard?

- Imperfect information
- Hundreds of objects
- Micro-actions, tricks of the trade don't work
- Real-time action! 5+ simulation cycles/sec

Computer opponents are weak because they don't

adapt, look-ahead, grasp spatial and temporal relations, collaborate, ...

**Easy for humans!**

## RTS game projects

- RTS programming environment, **server**
- State space abstraction & **planning**
- Opponent modeling, **learning**
- TD learning of **low-level behavior**
- **Path Finding**: Find safe routes fast
- Dealing with incomplete information

**"low hanging fruit"**

**many opportunities to improve the state of the art**

## Real-Time Decision Support Meetings

Fridays 14:00-15:00

CSC 333

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