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TEAM 2MC1 – MORE THAN A PLAYER

Overview

1. Workflow during a game
2. Structure of our player
3. Selected aspects of the implementation
4. Conclusion

1. Workflow during a game

Metagaming

- Rule Reordering
- Conjunction Reordering

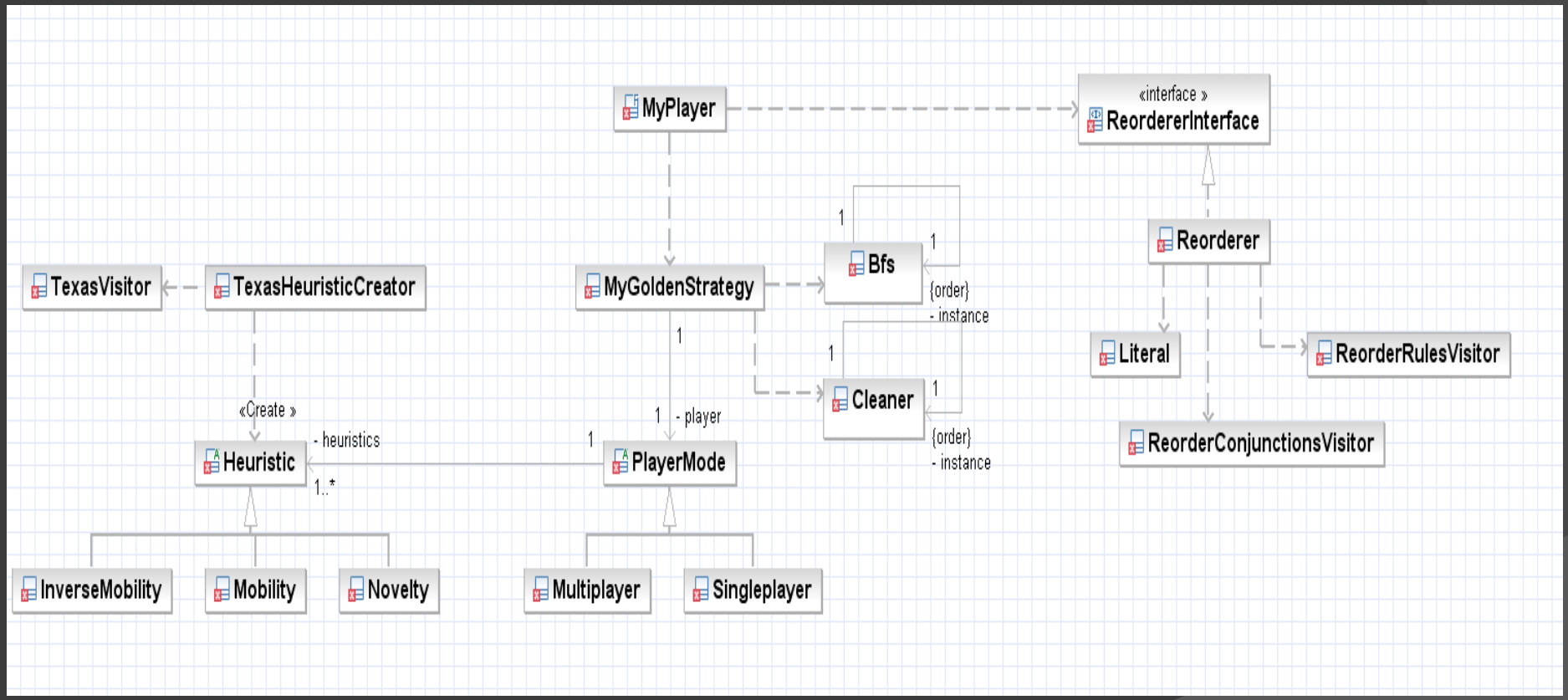
Preparation

- Heuristic creation and selection
- Preparation of the state space (Iterative Deepening)

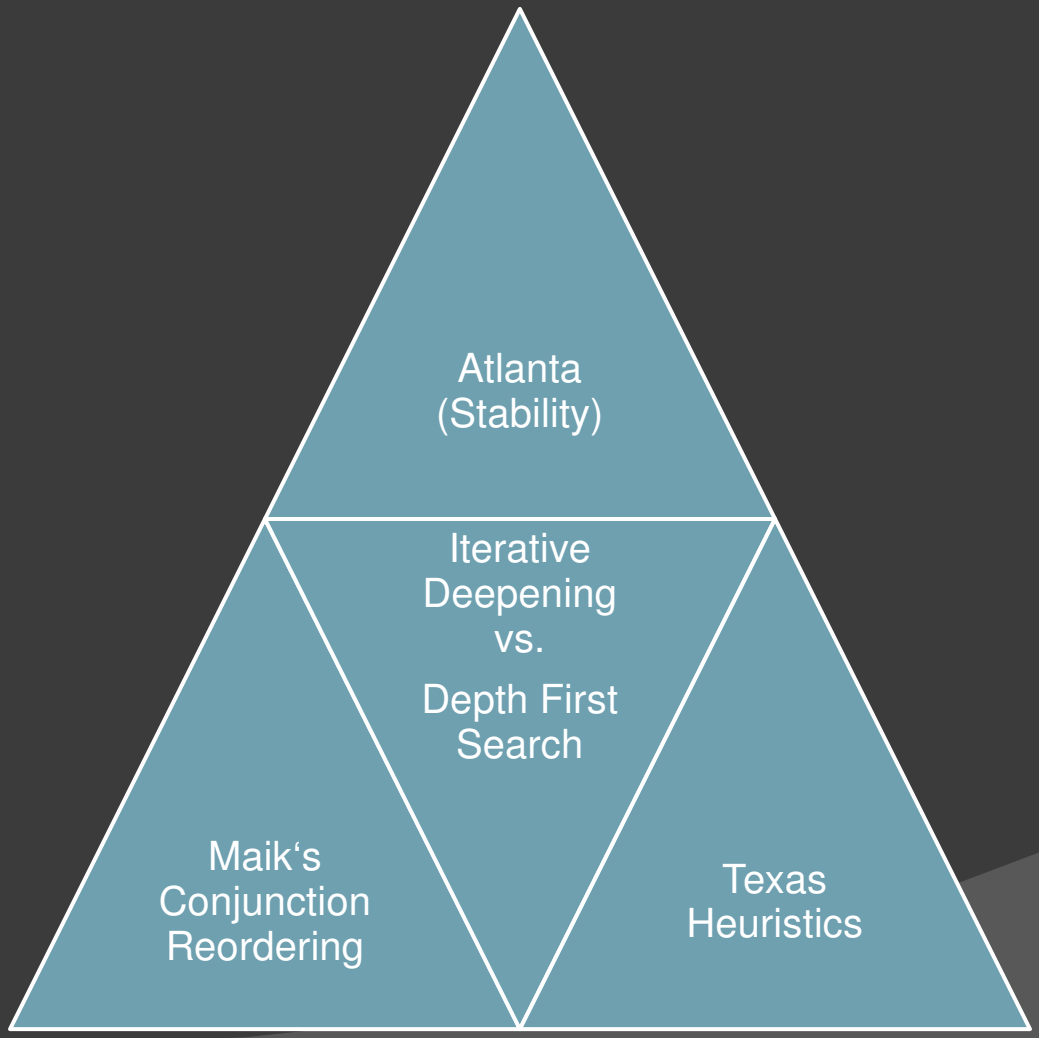
Gaming

- Extending the state space (Depth First Search)
- Retourning the best move

2. Structure of our player



3. Selected aspects of the implementation



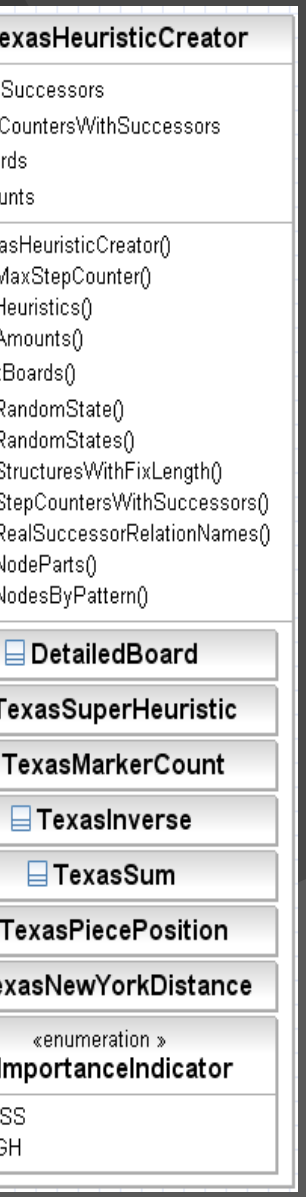
3. Selected aspects of the implementation

- Maik‘s Conjunction Reordering :
  - Algorithm by Watson Research Center NY
  - Reorder based on: dependency, grounded variables
  - care for variable safety

3. Selected aspects of the implementation

- Texas Heuristics (based on the Player of the University of Texas, July 2006) :
  - Identify Successor & Step Counter
  - Identify the (ordered) Board, Markers and Pieces
  - Create up to 1000 heuristics

- Select the best heuristic by a method, which is similar to the Monte Carlo Tree Search :
  - Follow the “golden way” of each heuristic and determine the reached goal score
  - The best 3 heuristics are used for the final mixed heuristic with the weights 66%, 30% and 4%



3. Selected aspects of the implementation

Atlanta (Stability) : Return always a valid response		
Redo Reordering if the occurs problems with the new Rule Set	**Arbitrary moves** if we don‘t know the best move for the current state	**Memory Observation** Cleaner thread started, if the memory exceeds 70%

3. Selected aspects of the implementation

- Iterative Deepening vs. Depth First Search:

	Iterative Deepening	**Depth First Search**
Used in our player …	… during preparation period	… during gaming period
Our goal	Find the nearest solution	Find possible goal states
Why?	Good for SP-Games and fast victories	Good for MP-Games, that need a certain field of vision
Extensions	Use of Alpha-Beta Pruning (if it's a 2 player, zero sum & turn taking game)	

4. Conclusion

- GGP : Great possibility to learn more about the realization of “thinking machines”
- Possible Improvements :
  - Goal Distance Heuristic
  - Better metagaming
  - Optimization for multi-core processors