Spiele in der Informatik

8. April 2024

Themenliste

Folgende Themen können im Seminar 'Spiele in der Informatik' im Sommersemester 2024 vergeben werden. Jede Zeile beinhaltet den Titel des Themas, Referenzen zu möglichen Quellen und eine grobe Einschätzung zur Schwierigkeit des Themas. Ein ★-Thema ist einfacher als ein ★★★-Thema. Die Termine der entsprechenden Vorträge richten sich im Groben nach der Sortierung der Themen.

- Einführung in die Spieltheorie

  1. Grundlagen der Spieltheorie und das Nash-Equilibrium [1] ★
  2. Matrix-Spiele und lineare Programmierung [1] ★
  3. Der Minimax-Algorithmus und Alpha-Beta-Pruning [1], [2] ★

- Fixpunkttheorie und Zwei-Spieler-Spiele

  4. Bisimulationsspiele [3], [4] ★★
  5. Energy Games [5], [6] ★
  6. Einfache stochastische Spiele [7], [8] ★★
  7. Paritätsspiele [9] ★★★

- Weitere Spiele

  8. 'Cops and Robbers' auf Graphen [10] ★★
  9. Nebenläufige Erreichbarkeitsspiele [11] ★★
  10. Routing-Spiele [12] ★★★

- Verwandte Themen

  11. Zero-Knowledge-Protokolle [13]–[15] ★★
  12. Auktionstheorie [16], [17] ★★
  13. AlphaGo [18], [19] ★★★

- Komplexitätsanalyse von Spielen

  14. Minesweeper ist NP-vollständig [20] ★★
  15. Rush Hour ist PSPACE-vollständig [21] ★★
  16. Tetris ist NP-vollständig [22] ★★★

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