

Quantitative Modelle der Informatik

10. Oktober 2022

Themen

Folgende Themen können im Seminar “Quantitative Modelle der Informatik” im SS 2022 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.

• Probabilistische Systeme und Metriken

1. Markow-Ketten [11], [21] (Ch.11) ★
2. Hidden Markow Models [26, 28] ★★
3. Stochastische Petri-Netze [25, 8] (Ch.8) ★★
4. Bayes'sche Netze [12, 32] ★★
5. Probabilistische Bisimulation [24], [7] (Ch.10.4.2) ★★
6. Probabilistisches Model-Checking [7] (Ch.10) ★★
7. Metrische Transitionssysteme [15] ★
8. Verhaltensmetriken für probabilistische Systeme [31, 4, 5] ★★
9. Simple Stochastic Games [13, 30] ★
10. Probabilistische Automaten [29, 14] ★★
11. PRISM, ein probabilistischer Model-Checker [23, 1] ★★

• Gewichtete Automaten

12. Grundlagen gewichteter Automaten [17] (Ch.1, 6.1-6.2) ★
13. Algorithmen für gewichtete Automaten [17] (Ch. 6.3-6.8) ★★
14. Ein probabilistischer Algorithmus für Sprachäquivalenz [22] ★★
15. Gewichtete Automaten für die Verarbeitung natürlicher Sprache [17] (Ch.14) ★★

• Weitere Themen

16. Energy Games [10, 16] ★
17. Zeitautomaten [3], [7] (Ch. 9) ★★★
18. UPPAAL, ein Tool für Zeitautomaten [9, 2] ★★
19. Grundlagen des Quanten-Computing und Quanten-Signalübertragung, [27] ★★★
20. Quantenprogrammierung in Quipper [19, 20] ★★★
21. Faktorisierung ganzer Zahlen in Polynomzeit mit Quantencomputern, [27] ★★★

References

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- [2] UPPAAL, an integrated tool environment for modeling, validation and verification of real-time systems modeled as networks of timed automata. <https://uppaal.org/>.
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