

# Quantitative Modelle der Informatik

4. April 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 [7], [16] (Ch.11) ★
2. Hidden Markow Models [19, 21] ★★
3. Probabilistische Bisimulation [18], [5] (Ch.10.4.2) ★★
4. Probabilistisches Model-Checking [5] (Ch.10) ★★
5. Metrische Transitionssysteme [10] ★★
6. Verhaltensmetriken für probabilistische Systeme [24, 2, 3] ★★★
7. Simple Stochastic Games [8, 23] ★★
8. Probabilistische Automaten [22, 9] ★★

- **Gewichtete Automaten**

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

- **Weitere Themen**

14. Energy Games [6, 11] ★★
15. Zeitautomaten [1], [5] (Ch. 9) ★★★
16. Grundlagen des Quanten-Computing und Quanten-Signalübertragung, [20] ★★★
17. Quantenprogrammierung in Quipper [14, 15] ★★★
18. Faktorisierung ganzer Zahlen in Polynomzeit mit Quantencomputern, [20] ★★★

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