



# Seminar Topics

## *Probabilistic Programming*

### (Winter 2024/25)

First name: \_\_\_\_\_

Surname: \_\_\_\_\_

Nickname (for website): \_\_\_\_\_

Matriculation no.: \_\_\_\_\_

Study programme:     BSc Informatik     MSc Informatik     Other: \_\_\_\_\_

Supervisor languages:     German     English

Please choose your three preferred topics from the following list (1st/2nd/3rd choice):

No.	Title	1.	2.	3.
<b>A. Semantics</b>				
1	Paradoxes of probabilistic programming			
2	Exact Recursive Probabilistic Programming.			
3	Lilac: A Modal Separation Logic for Conditional Probability			
4	Outcome Logic			
5	A pre-expectation calculus for probabilistic sensitivity			
<b>B. Verification</b>				
6	Positive Almost-Sure Termination: Complexity and Proof Rules			
7	Strong Invariants Are Hard			
8	Sound and Complete Proof Rules for Probabilistic Termination			
9	Almost-Sure Termination by Guarded Refinement			
10	On Lexicographic Proof Rules for Probabilistic Termination			
11	Reasoning about Grover's quantum search algorithm			
<b>C. Program Analysis</b>				
12	Equivalence and Similarity Refutation for Probabilistic Programs			
13	Compiling Probabilistic Programs for Variable Elimination with Information Flow			
14	Bit Blasting Probabilistic Programs			
15	Inference of Probabilistic Programs with Moment-Matching Gaussian Mixtures			