Interested? BSc/MSc/HiWi@FAI

Winter term course Automatic Planning:

- Heuristic functions: Partial delete relaxation, abstractions, landmarks, critical-path heuristics, cost partitionings.
- Analyzing heuristic functions: Compilability between heuristic functions, search space surface analysis.
- Optimality-preserving state-space reduction methods: Partial-order reduction, symmetry reduction, simulation-based dominance pruning.
- International Planning Competition: Languages, systems, results.
- Practical experience: You'll implement your own planning system and participate in a planning competition at the end of the course.

Active research in my research group FAI:

- Star-Topology Decoupling: A new state-space decomposition technique that can yield vast savings on problems with a client-server nature. Currently: Model checking, liveness properties, weak memory models.

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Active research in my research group FAI: (continued)

- NoGood learning: The first technique able to learn sound and generalizing knowledge from dead-end states during state space search. Currently: Probabilistic planning.
- Planning and ML: Using neural networks (NN) to learn heuristic functions and/or action policies. Model checking and visualizing NN action policies.
- Explainable AI Planning (XAIP): Analyzing plan-property dependencies to explain the space of plans. User studies, NASA collaboration, deeper "Why?" questions, identifying relevant plan properties automatically, ...
- Minecraft instruction generation (collab CoLi department): Hierarchical planning methods combined with natural language generation to plan instruction texts for constructing complex objects in Minecraft.
- Automated security testing (collab CISPA): Modeling attackers on networks, email infrastructure, etc. to analyze possible attacks; modeling defenses to assess cost-security trade-offs.