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31st IEEE International Conference on Emerging Technologies and Factory Automation

Call for Papers - SS 06 Capability- and Skill-based Engineering of Manufacturing Systems

Organized and Chaired by

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FOCUS. As customer requirements change increasingly often, flexible and adaptive automation approaches are needed. These require explicit descriptions of the functions production systems provide and products require. Recent research uses capabilities and skills based on holistic data models. Capabilities describe abstract functions a system can perform, while skills represent their executable implementations that create effects between defined initial and target states. To automatically satisfy requirements, tasks and domain constraints must be matched with available capabilities using techniques like AI planning or reasoning. The resulting process plans are then orchestrated through skills, simulated, optimized, and finally executed.

TOPICS

- Modeling of effects, capabilities, skills and services: data modeling, modeling languages,
- knowledge graphs, rule engines, knowledge-based systems, AI-based modeling, Asset
- Administration Shell (i.e., Ontologies, DSLs, Variability Models, OPC UA, ...)
- Capability matching algorithms: (semi)-automated planning, capability-task-matching,
- satisfiability checks, knowledge graph exploration, capability-effect-matching, verification of
- effect sequences
- Skill-based production: generation / modeling of process plans, orchestration, execution
- Process plan simulation: optimization, simulation techniques for skills
- Engineering methods: automated code generation, model-based programming, automated
- generation of models
- Organization of marketplaces: e.g. supply chains in data spaces via services

- **AIM.** This Special Session aims at bringing together professionals from industry and academia to share cutting-edge concepts, recent developments, research results, and practical achievements in the area of capability- and skill-based engineering of manufacturing systems.
- **CONFERENCE FORMAT**. The conference will comprise multi-track sessions for regular papers, to present significant and novel research results with a prospect for a tangible impact on the research area and potential implementations.

AUTHOR'S SCHEDULE (2026)

Regular and special sessions papers

Submission deadline	April 19
Acceptance notification	May 25
Deadline for final manuscripts	July 4

Work-in-progress/Industry practice papers

Submission deadline	May 31
Acceptance notification	June 19
Deadline for final manuscripts	July 4