

Fundamentals of Systems Modeling

Budapest University of Technology and Economics
Critical Systems Research Group

The Critical Systems Research Group (FTSRG – <https://ftsr.mit.bme.hu/en/>) has been conducting research in the field of model-based system design, verification and validation, and model-driven development techniques since 1994. FTSRG provides professional services and courses in the field of modeling, verification, safety-critical systems, and complex CPS applications. Our experienced team participated in both industrial and also research projects. Our courses are taken by international (Bosch, thyssenkrupp Components Technology, Knorr-Bremse) and also domestic companies.

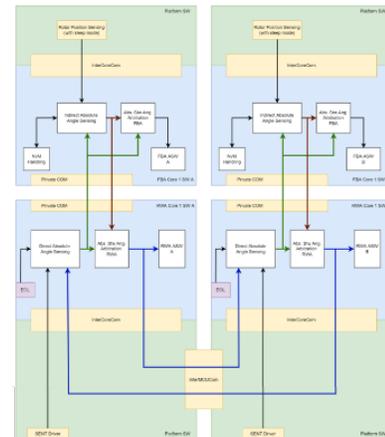
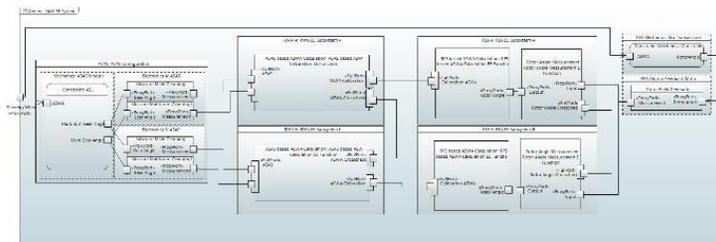
Course Overview

Goal:	Learn the fundamentals of modeling in software and systems engineering
Length:	2 days, 2 × 6 × 45 minutes
Level:	Introductory course, beginner level
Keywords:	Modeling, data modeling, structural modeling, behavior modeling, statecharts, activity, process, model analysis

Syllabus:

- Introduction to modeling
- Data and structure modelling
- Behavior modeling with statecharts and activity modeling
- Model analysis
- Success stories

Optional: practical sessions (modeling tools are subject to discussion)



Presenters:

András Vörös, PhD. is an associate professor at the Budapest University of Technology and Economics. His main research interest is formal methods and model-driven software and systems engineering. He received a Best Software Science paper award at ETAPS 2018. He served as a PC member of FTSCS 2016 and FTSCS 2018 (<http://www.ftscs.org/>), and he is a reviewer of various international conferences such as MODELS, FASE, ICGT, DSN, and SRDS. He delivered a talk at the RiSE Seminar (TU Wien) and HUSTEF 2018 (Testing Techniques for Critical Deep Learning Applications). He is a lecturer of the professional course "Model-driven system development based on UML/SysML" for industrial partners.



Vince Molnár, PhD. is an assistant professor at the Budapest University of Technology and Economics, Hungary. His main research field is model-based development and formal methods, with the primary focus on the design and verification of safety-critical systems. He is the leader of the development of the [Gamma Statechart Composition Framework](#). He participated in the EU projects [EMBrACE](#) and [ADVANCE](#) and is the technical lead in the [OpenSCALING](#) project. He was a member of the SysML v2 Submission Team and is now leading the Conformance and Formal Methods Working Groups of OMG's [Systems Modeling Community](#). He is an active member of the Semantics and Execution Working Groups as well.



Bence Graics, PhD. is a research fellow at the Budapest University of Technology and Economics, Hungary. His main research field is the model-driven development and verification of component-based reactive systems using formal methods. He has been the main developer of the open-source [Gamma Statechart Composition Framework](#) since 2016, a modeling framework for the component-based design and verification of reactive systems. He participated in the EU projects [EMBrACE](#) and [ADVANCE](#). He also participated in the [VKE](#) industrial project. He presented his work at multiple international conferences, such as ICSE'18, MODELS'20, DepCoS'21, FMICS'23 and FACS'23, as well as in the Software and Systems Modeling (SoSyM) and Systems Engineering (SE) journals.

