

# PALLADIO UPDATES

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SSP 2022 STATUS REPORT

# MOST INFLUENTIAL PAPER AWARDS

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- JSS 2020: "The Palladio Component Model for Model-driven Performance Prediction" has been awarded as one of the four finalist for the Journal of Systems and Software's "Most Influential Paper Award".
- ICPE 2020: "Automatically Improve Software Architecture Models for Performance, Reliability, and Costs Using Evolutionary Algorithms" by Anne Koziolk (Martens), Heiko Koziolk, Steffen Becker and Ralf Reussner has been awarded the „ICPE 10-years Most Influential Paper Award“.
- ICSA 2021: "PerOpteryx: automated application of tactics in multi-objective software architecture optimization" by Anne Koziolk, Heiko Koziolk, and Ralf Reussner has been awarded the „ICSA'21 10-years Most Influential Paper Award“.

# STRATEGIC OUTLOOK

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- Metamodel refactoring
  - Split metmodel in core and extensions
  - Major impact on all dependant tooling

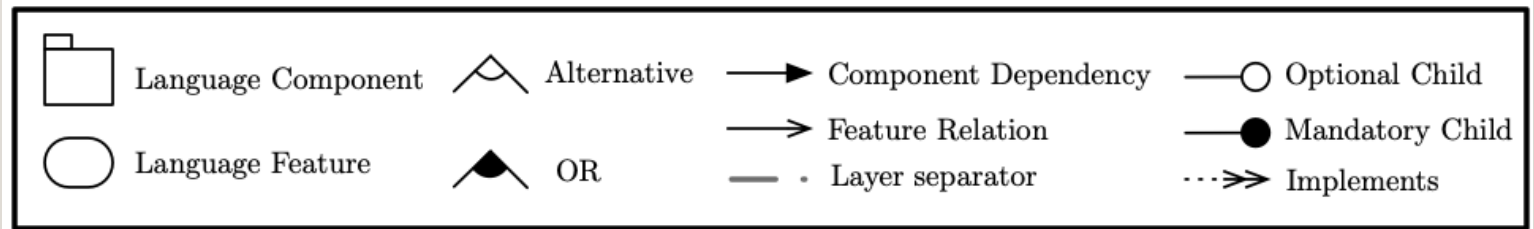
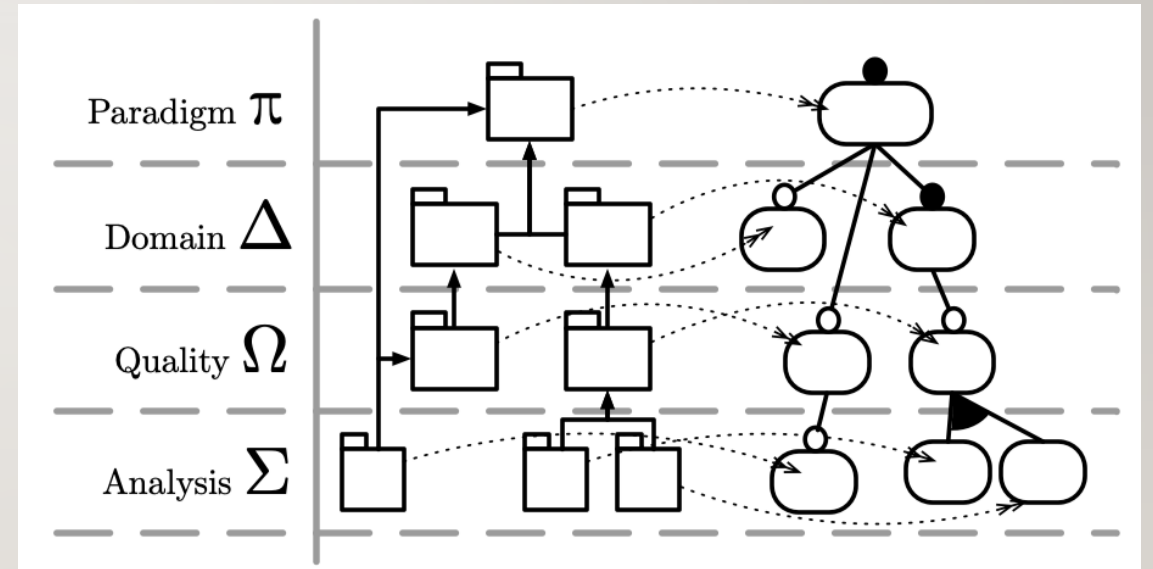
# MOTIVATION

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- Changes in the PCM and its simulators get more and more complex (Co-Evolution)
- Not all features of the PCM are needed and used in all simulators like SimuLizar or SimuCom
- Ongoing works on the PCM or its simulators are mainly dealing with maintenance

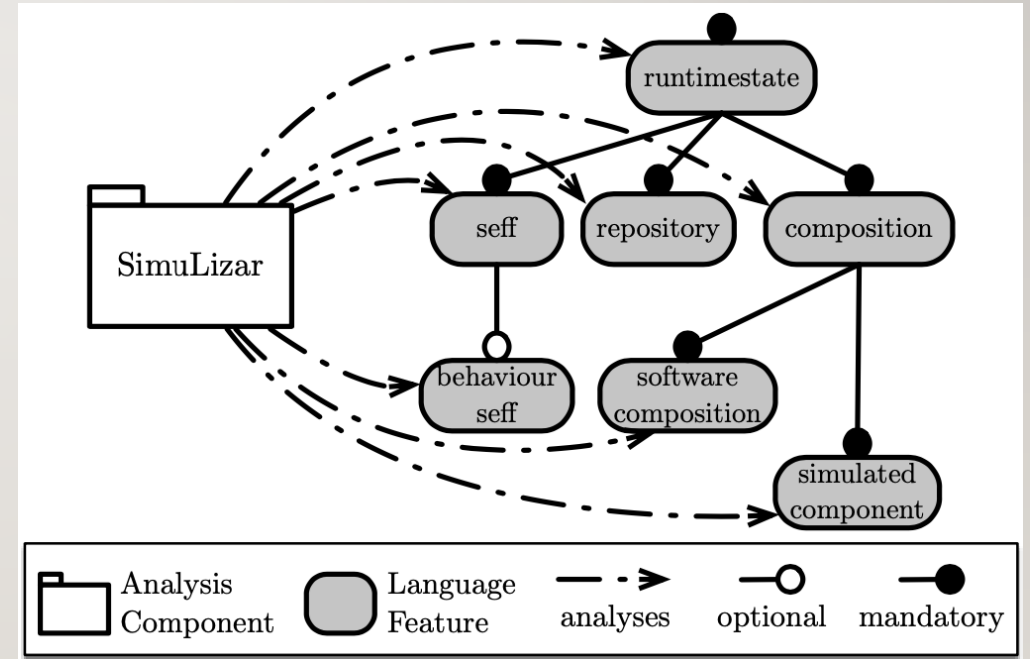
# MODULARIZATION OF THE PCM

- Split metamodel in dedicated features
- Introduce a layered architecture
- Feature configurations can be reused goal directed
- Deployment of features used in specific settings will be possible
- Simplified maintenance

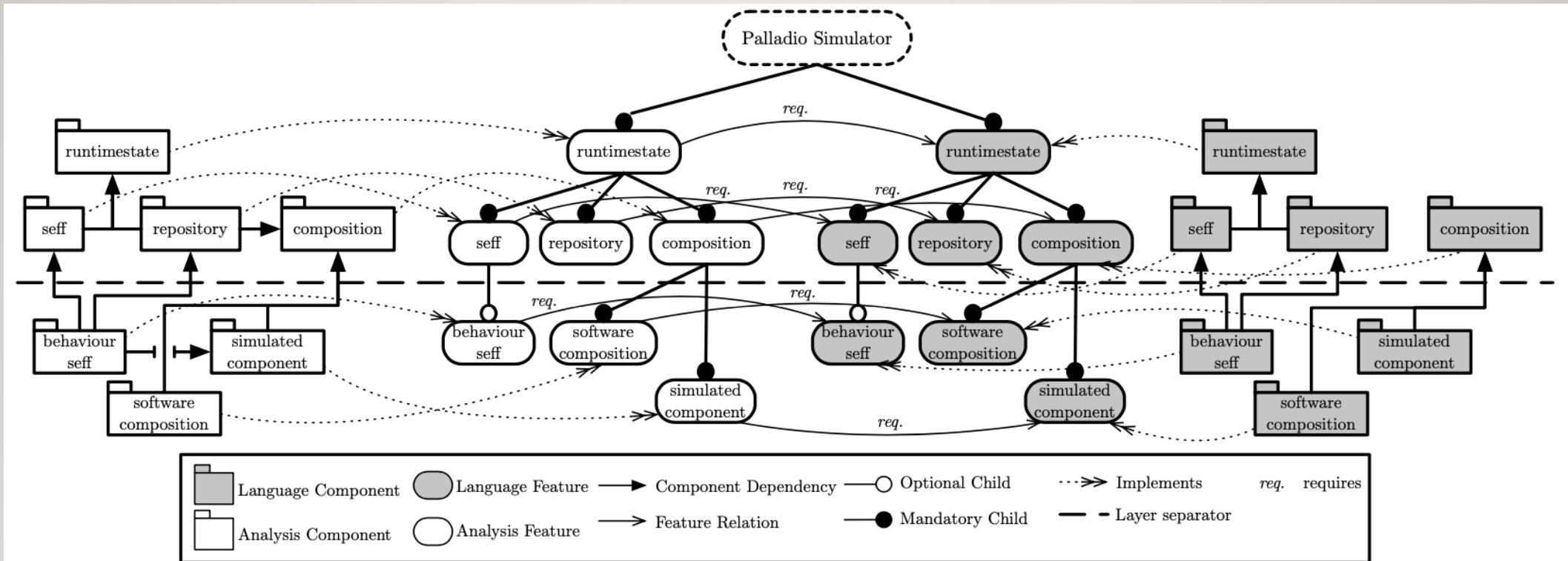


# MODULARIZING PCM AND SIMULATORS

- Split simulators in dedicated features
- Introduce a layered architecture
- Feature configurations can be reused goal directed
- Deployment of features used in specific settings will be possible
- Simplified maintenance



# MODULARIZING PCM AND SIMULATORS



# TIMELINE

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until 2019: Development of a module concept for DSMLs like the PCM

until 2023: Development of a module concept for model-based analyses like SimuLizar

from 2023: Start of the research project FeCoMASS\* in collaboration with RWTH Aachen

\*<https://fecomass.github.io/fecomass/>





# USAGE OF PALLADIO

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- In SofDCar [1]
  - Elasticity of OTA Update Processes
- With SICK
  - Extension of CIPM [2] for Lua

[1] <https://sofdcar.de>

[2] Continuous Integration of Performance Models <https://sdq.kastel.kit.edu/wiki/CIPM>

# UNDER THE HOOD

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- New Simulator *Slingshot*
  - Experimental composable and extensible simulator
  - Event-based → Scalable
  - Contract-based → Integrated verification and documentation facilities
  - Supports Basic-PCM elements, reconfigurations, measurements and (upcoming) planning
- New and Revisited Extractors
  - Extraction and continuous extraction, incremental model updates
  - Planned support for reliability properties by extracting failure probabilities

# UNDER THE HOOD CONT.

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- Confidentiality analyses
- Build system maintenance and new JDK (i.e. JDK 17) support