



DAGSTUHL
ARTIFACTS SERIES

Volume 11 | Issue 2 | June, 2025

Special Issue of the 39th European Conference on Object-Oriented
Programming (ECOOP 2025)

Edited by

Karine Even-Mendoza

Raphaël Monat

Yannick Zakowski

ISSN 2509-8195

DARTS Special Issue Editors

Karine Even-Mendoza 

King's College London, UK
karine.even_mendoza@kcl.ac.uk

Raphaël Monat 

Inria & University of Lille, France
raphael.monat@inria.fr

Yannick Zakowski 

Inria Paris, France
yannick.zakowski@inria.fr

ACM Classification 2012

Software and its engineering

Published online and open access by

Schloss Dagstuhl – Leibniz-Zentrum für Informatik
GmbH, Dagstuhl Publishing, Saarbrücken/Wadern,
Germany.

Online available at

<https://drops.dagstuhl.de/darts>.

Publication date

June, 2025

License

This work is licensed under a Creative Commons Attribution 4.0 International license (CC BY 4.0): <https://creativecommons.org/licenses/by/4.0>.



In brief, this license authorizes each and everybody to share (to copy, distribute and transmit) the work under the following conditions, without impairing or restricting the authors' moral rights:

- Attribution: The work must be attributed to its authors.

The copyright is retained by the corresponding authors.

Aims and Scope

The Dagstuhl Artifacts Series (DARTS) publishes evaluated research data and artifacts in all areas of computer science. An artifact can be any kind of content related to computer science research, e.g., experimental data, source code, virtual machines containing a complete setup, test suites, or tools.

Contact

Schloss Dagstuhl – Leibniz-Zentrum für Informatik
DARTS, Editorial Office
Oktavie-Allee, 66687 Wadern, Germany
publishing@dagstuhl.de

Digital Object Identifier

10.4230/DARTS.11.2.0

<https://www.dagstuhl.de/darts>

■ Contents

Preface	
<i>Karine Even-Mendoza and Raphaël Monat and Yannick Zakowski</i>	0:vii
Artifact Evaluation Process	
.....	0:ix
Artifact Evaluation Committee	
.....	0:xi

Artifacts

Ensuring Convergence and Invariants Without Coordination (Artifact)	
<i>Dina Borrego, Nuno Preguiça, Elisa Gonzalez Boix, and Carla Ferreira</i>	1:1–1:7
Bottom-Up Synthesis of Memory Mutations with Separation Logic (Artifact)	
<i>Kasra Ferdowsi and Hila Peleg</i>	2:1–2:3
Multiparty Asynchronous Session Types: A Mechanised Proof of Subject Reduction (Artifact)	
<i>Dawit Tirore, Jesper Bengtson, and Marco Carbone</i>	3:1–3:5
Contract Systems Need Domain-Specific Notations (Artifact)	
<i>Cameron Moy, Ryan Jung, and Matthias Felleisen</i>	4:1–4:2
Compositional Static Value Analysis for Higher-Order Numerical Programs (Artifact)	
<i>Milla Valnet, Raphaël Monat, and Antoine Miné</i>	5:1–5:5
Declarative Dynamic Object Reclassification (Artifact)	
<i>Riccardo Sieve, Eduard Kamburjan, Ferruccio Damiani, and Einar Broch Johnsen</i>	6:1–6:3
Practical Type-Based Taint Checking and Inference (Artifact)	
<i>Nima Karimipour, Kanak Das, Manu Sridharan, and Behnaz Hassanshahi</i>	7:1–7:2
A Theory of (Linear-Time) Timed Monitors (Artifact)	
<i>Mouloud Amara, Giovanni Bernardi, Mohammed Aristide Foughali, and Adrian Francalanza</i>	8:1–8:3
Compositional Bug Detection for Internally Unsafe Libraries: A Logical Approach to Type Unsoundness (Artifact)	
<i>Pedro Carrott, Sacha-Élie Ayoun, and Azalea Raad</i>	9:1–9:2
The Algebra of Patterns – Rocq Proofs (Artifact)	
<i>David Binder and Lean Ermantraut</i>	10:1–10:2
Efficient Neural Network Verification via Order Leading Exploration of Branch-and-Bound Trees (Artifact)	
<i>Guanqin Zhang, Kota Fukuda, Zhenya Zhang, H.M.N. Dilum Bandara, Shiping Chen, Jianjun Zhao, and Yulei Sui</i>	11:1–11:3
Lightweight Diagramming for Lightweight Formal Methods: A Grounded Language Design (Artifact)	
<i>Siddhartha Prasad, Ben Greenman, Tim Nelson, and Shriram Krishnamurthi</i>	12:1–12:11

39th European Conference on Object-Oriented Programming (ECOOP 2025).

Editors: Karine Even-Mendoza, Raphaël Monat, and Yannick Zakowski

Dagstuhl Artifacts Series, Vol. 11, Issue 2, Artifact No. 0, pp. 0:v–0:xii



DAGSTUHL

ARTIFACTS SERIES

Dagstuhl Artifacts Series

Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

Incremental Computing by Differential Execution (Artifact)	
<i>Prashant Kumar, André Pacak, and Sebastian Erdweg</i>	13:1–13:8
WebGlitch: A Randomised Testing Tool for the WebGPU API (Artifact)	
<i>Matthew K. L. Wong and Alastair F. Donaldson</i>	14:1–14:4
Reusing Caches and Invariants for Efficient and Sound Incremental Static Analysis (Artifact)	
<i>Mamy Razafintsialonina, David Bühler, and Valentin Perrelle</i>	15:1–15:5
A Lightweight Method for Generating Multi-Tier JIT Compilation Virtual Machine in a Meta-Tracing Compiler Framework (Artifact)	
<i>Yusuke Izawa, Hidehiko Masuhara, and Carl Friedrich Bolz-Tereick</i>	16:1–16:4
GSOHC: Global Synchronization Optimization for Heterogeneous Computing (Artifact)	
<i>Soumik Kumar Basu and Jyothi Vedurada</i>	17:1–17:7
Quantifying Cache Side-Channel Leakage by Refining Set-Based Abstractions (Artifact)	
<i>Jacqueline L. Mitchell and Chao Wang</i>	18:1–18:4

■ Preface

ECOOP has a long-standing tradition of offering artifact evaluation dating back to 2013. This year, the artifact evaluation has focused the scope of the artifact evaluation process to accepted papers only—in contrast with the ECOOP tradition of evaluating artifacts at the same time as papers are reviewed.

In order to ensure a thorough and efficient artifact evaluation process, we recruited a large and diverse artifact evaluation committee that included a total of 54 artifact reviewers. The artifact submissions were due a few days after papers were accepted at ECOOP. Due to the aforementioned change in the artifact evaluation process, we received a total of 21 submissions this year (out of all *accepted* papers), down from 64 last year (out of all *submitted* papers). From these 21 submissions, 8 were awarded the functional badge only, and 10 were awarded both the functional and the reusable badges (highest qualification).

Due to this year’s exceptionally tight calendar constraints for artifact evaluation, and in order to address potential hardware shortcomings, each artifact has been assigned four reviewers instead of the traditional three. The reviewing phase began with a kick-the-tires review and author response, during which authors had the opportunity to clarify or address technical issues encountered with their submissions. Full reviews have been provided a few weeks later.

Since 2023, we have followed the ACM’s badging policy¹. Details about the evaluation process and results can be found in the ECOOP 2025 DARTS proceedings.

The smooth and thorough artifact evaluation process would not have been possible without the members of the committee, who handled the artifact review workload with great dedication. We would like to thank them for their valuable work, feedback to authors, and inspiring discussions! We would also like to thank the ECOOP 2025 program committee chairs Jonathan Aldrich and Alexandra Silva for the pleasant and productive interactions over the coordination of the paper and artifact review processes, and the Dagstuhl Publishing team for their proactive and highly responsive assistance during the preparation of this DARTS volume.

Karine Even-Mendoza
King’s College London

Raphaël Monat
Inria Lille & University of Lille

Yannick Zakowski
Inria Paris

Artifact Evaluation Co-chairs

¹ <https://www.acm.org/publications/policies/artifact-review-and-badging-current>

■ Artifact Evaluation Process

Following ECOOP’s long standing tradition of artifact evaluations, the artifact review process for ECOOP 2025 builds on a wealth of experiences and insights from previous years and adopts concepts that have proven successful, such as the ‘kick-the-tires’ review phase and the adoption of the ACM’s badging scheme.

In order to streamline and reduce the variance in the process, we asked authors to fill out a detailed submission form², explicitly listing all experimental claims from their paper alongside steps to reproduce those claims. We further provided the artifact evaluation committee with a detailed reviewing template³.

Selecting the Committee

We distributed and publicized a self-application form to select artifact evaluation committee members. In general, members ranged from junior PhD students to postdocs with a few years of experience, as well as industry practitioners. Most members we selected had previous experience in performing artifact evaluation. We ensured the committee was diverse, both in terms of expertise, gender and geographical location. In particular, we made sure our committee would have a wide range of expertise addressing all potential topics related to ECOOP.

Badges

We wish to highlight that for an artifact to be granted the “functional” badge, the ACM policy requires it to be “Complete [meaning that] to the extent possible, all components relevant to the paper in question are included”. Following last year’s tradition, we have continued to enforce this constraint for ECOOP 2025. In our experience, this is a stricter interpretation than most other artifact evaluation committees. We hope that this move – following ACM’s policy – will raise the bar and overall improve the quality of artifacts.

² <https://zenodo.org/records/15046467>

³ <https://zenodo.org/records/15046382>

■ Artifact Evaluation Committee

Gianluca Aguzzi
University of Bologna

Aditya Anand
Indian Institute of Technology Bombay

Martina Baiardi
University of Bologna

Jim Bauwens
Vrije Universiteit Brussel

Jérôme Boillot
École Normale Supérieure, Inria Paris

Yazhuo Cao
King's College London

Yanju Chen
University of California, Santa Barbara

Aidan Dakhama
King's College London

Maxence Demougeot
IRIT

Adhitha Dias
Purdue University

Davide Domini
University of Bologna

Alexandre Doyen
Université Paris-Saclay, CEA, List

Johannes Dösing
Technische Universität Dortmund

Sophie Ebersold
Université de Toulouse - IRIT

Ayşe Irmak Ercevik
King's College London

Nicolas Farabegoli
University of Bologna

Eduardo Fernandes
Polytechnic School of the University of São Paulo (Poli-USP)

Marco Giunti
University of Oxford

Yujiang Gui
UNSW, Australia

Dongjie He
Chongqing University

Ningyu He
The Hong Kong Polytechnic University

Asmae Heydari
Tabar Karlsruhe Institute of Technology (KIT)

Xuejing Huang
IRIF

Zunchen Huang
CWI

Grant Iraci
University at Buffalo

Md Mahir Asef Kabir
Virginia Tech

Marian Lingsch-Rosenfeld
LMU Munich

Teodors Lisovenko
Ca' Foscari University of Venice

Chengwei Liu
Nanyang Technological University

Jing Liu
UC Irvine & MPI-SP

Tarek Mahmud
Texas State University

Austin Mordahl
The University of Illinois Chicago

Malte Mues
Bergische Universität Wuppertal

Nuntipat Narkthong
Northeastern University

Melane Navaratnarajah
King's College London

Adel Noureddine
Université de Pau et des Pays de l'Adour

39th European Conference on Object-Oriented Programming (ECOOP 2025).

Editors: Karine Even-Mendoza, Raphaël Monat, and Yannick Zakowski

Dagstuhl Artifacts Series, Vol. 11, Issue 2, Artifact No. 0, pp. 0:xi–0:xii



Dagstuhl Artifacts Series

Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

Luca Olivieri
Ca' Foscari University of Venice

Yuxin Qiu
University of California, Riverside

Weihao Qu
Monmouth University

Baber Rehman
University of Hong Kong

Hamza Remmal
EPFL

Neea Rusch
Augusta University

Farhan Saif
University of Illinois Chicago

Iti Shree
King's College London

Avaljot Singh
University of Illinois, Urbana-Champaign

Rob Sison
UNSW Sydney

Aosen Xiong
University of Waterloo

Jifeng Xuan
Wuhan University

George Zakhour
Universität St. Gallen

Giacomo Zanatta
Ca' Foscari University of Venice

Gennaro Zanfardino
University of L'Aquila

Guanqin Zhang
University of New South Wales

Zenong Zhang
The University of Texas at Dallas

Yi Zhou
Carnegie Mellon University