June 7, 2022 Berlin, Germany



Advancing Computing as a Science & Profession



COP '22

Proceedings of the 14th International Workshop on

Context-Oriented Programming and Advanced Modularity

Edited by:

Yudai Tanabe, Jens Lincke, Robert Hirschfeld, Atsushi Igarashi, Hidehiko Masuhara

Sponsored by:

ACM SIGPLAN

Co-located with:

ECOOP '22



The Association for Computing Machinery 1601 Broadway, 10th Floor New York, New York 10019, USA

ACM COPYRIGHT NOTICE. Copyright © 2022 by the Association for Computing Machinery, Inc. Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Publications Dept., ACM, Inc., fax +1 (212) 869-0481, or permissions@acm.org.

For other copying of articles that carry a code at the bottom of the first or last page, copying is permitted provided that the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, +1-978-750-8400, +1-978-750-4470 (fax).

ACM ISBN: 978-1-4503-9986-9

Cover photo by Florian Wehde on Unsplash.

Message From the Chairs

Contextual information plays an ever-increasing role in our information-centric world. Current-day software systems adapt continuously to changing execution and usage contexts, even while running. Unfortunately, mainstream programming languages and development environments still do not support this kind of dynamicity very well, leading developers to implement complex designs to anticipate various dimensions of variability.

Context-Oriented Programming directly supports variability at the programming level, depending on a wide range of dynamic attributes. It enables run-time behavior to be dispatched directly on any detected properties of the execution or user context. Since more than a decade, researchers have been working on a variety of notions approaching that idea. Implementations ranging from first prototypes to mature platform extensions used in commercial deployments have illustrated how multidimensional dispatch can be supported effectively to achieve expressive run-time variation in behavior.

This volume contains the papers presented at COP 2022: the 14th International Workshop on Context-oriented Programming held on June 7, 2022 as part of ECOOP in Berlin. Authors presented their work in 30 min talks, and everyone engaged in lively discussions that extended beyond the end of the scheduled time. There were 7 submissions. Each submission was reviewed by at least 3 program committee members. The committee decided to accept 6 papers.

Our post-workshop proceedings allowed authors to reflect on the feedback they got from the program committee and the workshop participants and improve their submission.

We would like to thank our program committee, all workshop attendees, and most importantly our authors for their contributions, constructive criticism, hard work, and willingness to share their ideas.

— Jens Lincke, Yudai Tanabe, Robert Hirschfeld, Atsushi Igarashi, and Hidehiko Masuhara

Presented Papers

Layer Activation Mechanism for Asynchronous Executions in JavaScript Hiroaki Fukuda, Paul Leger and Nicolás Cardozo
Explicit Tool Support for Implicit Layer Activation
Modeling Flexible Monitoring Systems with a Role-Based Control Loop
Guard the Cache: Dispatch Optimization in a Contextual Role-Oriented Language
Generating Virtual Scenarios for Cyber Ranges from Feature-Based Context-Oriented Models: A Case Study
A Step Toward Programming with Versions in Real-World Functional Languages44 Yudai Tanabe, Luthfun Anshar Lubis, Tomoyuki Aotani and Hidehiko Masuhara

Web

https://2022.ecoop.org/home/COP-2022

Program Committee

Elisa Gonzalez Boix, Vrije Universiteit Brussel, Belgium Hiroaki Fukuda, Shibaura Institute of Technology, Japan Tetsuo Kamina, Oita University, Japan Paul Leger, Universidad Católica del Norte, Chile Yu David Liu, State University of New York at Binghamton, USA Natsuko Noda, Shibaura Institute of Technology, Japan Harumi Watanabe, Tokai University, Japan Benoît Duhoux, Université catholique de Louvain (UCL), Belgium Kenji Hisazumi, Shibaura Institute of Technology, Japan Mehdi Bagherzadeh, Oakland University, USA Nicolás Cardozo, Universidad de los Andes, Colombia David H. Lorenz, The Open University of Israel, Technion, Israel Gary Leavens, University of Central Florida, USA Kim Mens, Université catholique de Louvain, Belgium Atsushi Igarashi, Kyoto University, Japan Yudai Tanabe, Tokyo Institute of Technology, Japan Jens Lincke, Hasso Plattner Institute, Germany Robert Hirschfeld, Hasso Plattner Institute, University of Potsdam, Germany Hidehiko Masuhara, School of Computing, Tokyo Institute of Technology, Japan

Organizers

Yudai Tanabe, Tokyo Institute of Technology, Japan Jens Lincke, Hasso Plattner Institute, University of Potsdam, Germany Robert Hirschfeld, Hasso Plattner Institute, University of Potsdam, Germany Atsushi Igarashi, Kyoto University, Japan Hidehiko Masuhara, School of Computing, Tokyo Institute of Technology, Japan