



**PLoP® 2023 Conference Proceedings**  
**30<sup>th</sup> CONFERENCE ON PATTERN LANGUAGES OF PROGRAMS**

**October 22–25, 2023, Allerton Park, Monticello, Illinois, USA**

# Proceedings

**Editors: Valentino Vranić, Kyle Brown, Joseph Yoder, and  
Richard Gabriel**



PLoP® 2023 was held in cooperation with the ACM



PLoP® Conferences are sponsored by the Hillside Group.  
PLoP® is a registered trademark of The Hillside Group.

# Copyright Page

PLoP 2023 was held in cooperation with the ACM.

The Pattern Languages of Programs (PLoP®) conference is a premier event for pattern authors and pattern enthusiasts to gather, discuss and learn more about patterns and software development. PLoP® conferences are promoted and sponsored by The Hillside Group. The Hillside Group, through PLoP® and other activities, promotes the use of patterns and pattern languages to record, analyze, and improve software and its development, and supports any new practices that help achieve these goals.

Preliminary versions of these papers went through writers' workshops at Pattern Languages of Programs (PLoP) '23 October 22–25, 2023, Allerton Park, Monticello, Illinois, USA. Permission to make digital or hard copies of all or part 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. To copy otherwise, to republish, to post on servers or to redistribute to lists, requires prior specific permission. Copyright is held by the authors.

**ISBN: HILLSIDE 978-1-941652-19-0**

Made in the USA

# Table of Contents

Preface	4
Keynotes	6
Focus Groups	6
Lightning Talks	6
Papers	7
Conference Organization	10

# Preface

After three years of being organized remotely, the Conference on Pattern Languages of Programs (PLoP) came back to the place of its origin, legendary Allerton Park, where it was established by The Hillside Group. In its 30th edition, it again gathered people who wish to improve the quality of life through designing and using social and technical systems in a more humane way, effectively articulating professional and other creative practices, and sharing this tacit knowledge more broadly. To achieve this, PLoP conferences promote the use of patterns and pattern languages, as well as the underlying theory of the nature of order. Originating in the work of Christopher Alexander on building architecture, these ideas have been further developed in computer science, fundamentally changing the perception of software development. Much of the pioneering work in this area originated at this and other PLoP conferences throughout the world.

Patterns and pattern languages have expanded to many other areas and PLoP 2023 continued to recognize this by accommodating 30 papers targeting learning, usage of mathematical tools, well-being and life organization, pattern history, reflection, and expression, culture and mythological aspects, marketing, and so on, as well as software development topics, such as organizational patterns, digital transformation, resource management, cybersecurity, artificial intelligence and large language models, and even quantum computing.

All these papers underwent a two month open reviewing and mentoring process we call shepherding. At the conference, each paper was discussed in a writers' workshop, where a group of authors (and possibly additional participants) discusses each paper for about an hour in the presence of its author or authors, who, however, are only allowed to listen. These proceedings bring the final versions of 29 papers (one paper was withdrawn) revised after the conference according to what the authors learned in writers' workshops. The proceedings also include two focus group reports reviewed by the program committee members.

Apart from writers' workshops, the 30th PLoP had a really rich program with five keynotes, seven focus groups, six lightning talks, an art school and games, and even a short play built using drama patterns. The keynotes were very diverse and thought-provoking. Grady Booch joined us remotely and talked about a pattern language for the brain. Alistair Cockburn came to tell us how no one actually reads the patterns we write, which certainly made us think of how to make our patterns more digestible. Rebecca Wirfs-Brock and Lise Hvatum talked about the inspirational value of patterns. Indu Alagarsamy presented software resilience patterns inspired by the real world. Eduardo Guerra talked about using hypothesis engineering to manage uncertainty in software architectures.

In focus groups, participants gained practical experience with sharing cherished qualities of pattern languages, fearless change patterns, a pattern language for nurturing an exciting life, academic writing patterns, learning about organizational patterns from drama patterns, prompt patterns for large language models, and sustainable productivity patterns. Lightning talks brought a five-minute insight into new frontiers in pattern languages of practices, how

conflicts are what make patterns alive, how pattern languages can be brought through pattern cards, objects, coins, songs, and manga, how serious games seriously miss patterns, how pattern language creation is rooted in Husserl's Phenomenology, and adding emojis in code.

PLoP 2023 attracted attendees ranging from those who stood upon establishing this series of conferences to newcomers. We all interacted closely in a typical inclusive PLoP environment, where everyone feels welcome. All in all, PLoP 2023 proved that this series of conferences should continue.

Valentino Vranić and Kyle Brown, PLoP 2023 Program Chairs

## Keynotes

"A Pattern Language for the Brain" by Grady Booch

"The Take-Home Value of a Pattern is Its Name & Other Observations from 30 Years of Patterns Use" by Alistair Cockburn

"Go Build Your Thing—and in the Process Inspire Others to Do the Same" by Rebecca Wirfs-Brock and Lise Hvatum

"Software Resilience Patterns: Ideas from the Real World" by Indu Alagarsamy

"Using Hypotheses Engineering to Manage Uncertainty in Software Architectures" by Eduardo Guerra

## Focus Groups

"CheriSharing: Sharing Cherished Qualities of Pattern Languages" by Sawami Shibata, Kento Takamura, and Takashi Iba

"Fearless Change Patterns Game & App: Taking your patterns to the next level" by Mary Lynn Manns

"Future-Self Immersion with Using A Pattern Language for Nurturing an Exciting Life" by Rio Nitta, Takako Kanai, Mizuki Ota, Sae Adachi, and Takashi Iba

"Improving Your Papers with Academic Writing Patterns" by Sae Adachi and Takashi Iba

"Learning about Organizational Patterns from Drama Patterns" by Valentino Vranić, Aleksandra Vranić, and Branislava Vranić

"Prompt Patterns for Large Language Models" by Doug Schmidt

"Sustainable Productivity Patterns" by Ceci Fernandes and Antonio Gerent (Panda)

## Lightning Talks

"New Frontiers in Pattern Languages of Practices" by Takashi Iba

"Conflicts Make Patterns Alive" by Valentino Vranić

"Exploring New Ways of Expressing and Delivering Pattern Languages: Endeavors of Pattern Card, Object, Coin, Song, and Manga" by Takashi Iba

"Serious Games Seriously Miss Patterns" by Branislava Vranić

"Philosophical Foundations of Pattern Language Creation: Rooted in the "Science of Essence" in Husserl's Phenomenology" by Takashi Iba

"Adding Emojis in Code" by Eduardo Guerra

# Papers

## **Group Seljuk Being**, led by Richard P. Gabriel

### **"Leading a Software Architecture Revolution"**

by Marden Neubert and Joseph W. Yoder

### **"AHA! Strategies for Gaining Insights into Software Design"**

by Mary Shaw

### **"Using Japanese Yokai Culture as a Pattern Language in a Corporate Case Study"**

by Wataru Kurihara and Atsushi Hasegawa

### **"Patterns for Returning Multiple Results"**

by Andrew P. Black

### **"A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT"**

by Jules White, Quchen Fu, Sam Hays, Michael Sandborn, Carlos Olea, Henry Gilbert, Ashraf Elnashar, Jesse Spencer-Smith, and Douglas C. Schmidt

## **Group Turtles in the Border**, led by Neil Harrison

### **"Circle of Trust and Responsibility"**

by Neil Harrison

### **"Organizational Patterns: Looking Back Nearly 30 Years"**

by Neil Harrison

### **"Unveiling Connections: Integrating Climate Studies and Cybersecurity Education"**

by Mary Tedeschi

### **"Patterns of Patterns II"**

by Joseph Corneli, Noorah Alhasan, Leo Vivier, Alex Murphy, Raymond S. Puzio, Abby Tabor, Sridevi Ayloo, Charlotte Pierce, Mary Tedeschi, Manvinder Singh, Kajol Khetan, and Charles J. Danoff

### **"Pattern Manga: Attractively Expressing Patterns of a Pattern Language in Manga Style"**

by Takashi Iba, Hiroaki Tanaka, Sae Adachi, Mizuki Ota, and Urara Tajima

## **Group Saph Mihrab with Plum Blossoms**, led by Rebecca Wirfs-Brock

### **"Applying Pattern Language from Places to Programs and Practices: Unveiling the Exploratory Journey of the Study and Community through Oral History and Autoethnography"**

by Takashi Iba

### **"Exploring the Generative Nature of Patterns"**

by Lise Hvatum and Rebecca Wirfs-Brock

### **"CheriSharing Patterns: A Pattern Language for Sharing Cherished Qualities of a Community"**

by Sawami Shibata, Kento Takamura, Yuki Maeda, and Takashi Iba

### **"Patterns for Deepening Understanding with Peers in a Pattern Language for Value-Creation Marketing"**

by Takashi Iba, Miho Masai, Yuuri Abe, and Yuji Kosaka

## **Group Endless Repeating Design**, led by Steve Berczuk

### **"SCM Pattern Looking Back and Forward"**

by Steve Berczuk

### **"Pattern Language for the Modeling Practices of MATLAB and Simulink"**

by Hiroki Itoh and Yasuo Hosotan

### **"Patterns for Software Systems in Low-Resource Environments"**

by Abayomi Agbeyangi and Hussein Suleman

### **"Well-Being Patterns: A Pattern Language for Well-Being at Work"**

by Erika Inoue, Kazuki Hioki, An Hikino, Yutaka Otsuka, Tatsuo Hidaka, Masatada Kobayashi, and Takashi Iba

### **"Patterns for Low-Code Developer Experience"**

by Daniel Pinho, Ademar Aguiar, and Vasco Amaral

## **Group Waving Border**, led by Valentino Vranić

### **"Patterns of Organizing Remote Users with Agile Teams"**

by Mohammad Daud Haiderzai and Valentino Vranić

### **"Digital Transformation: Exploring Organizational Patterns at the Intersection of Society, Culture, and Technology"**

by Mohammad Yusuf Momand and Valentino Vranić



**"Creating a Pattern Language of Practices from Corporate Values, Part 2: The Case of Rakuten Group's Corporate Value Statement of Five Principles for Success"**

by Haruto Aoki, Erika Inoue, Sawami Shibata, Yukiko Ochiai, Tatsuo Hidaka, Masatada Kobayashi, and Takashi Iba

**"A Pattern Language for Filipino Youth to Live a Self-Reliant Life"**

by Takako Kanai, Mizuki Ota, and Takashi Iba

**"Generator Patterns: A Way of Being That Fascinates Others with the Attractive World and Generates Discoveries and Excitement"**

by Kaito Shiota, Kiyoka Hayashi, Aoi Imai, Hiroaki Tanaka, and Takashi Iba

**Group Flaming Animal Spirit with Vultures, led by Kyle Brown**

**"Patterns for Quantum Circuit Cutting"**

by Marvin Bechtold, Johanna Barzen, Martin Beisel, Frank Leymann, and Benjamin Weder

**"Towards a Software Architecture Training Pattern Language"**

by Wilson Libardo Pantoja Yopez, Julio Ariel Hurtado Alegria, Luis Mariano Bibbo, Alejandro Fernandez, and Ajay Bandi

**"Security Argument patterns for Deep Neural Network Development"**

by Marwa Zeroual, Brahim Hamid, Morayo Adedjouma, and Jason Jaskolka

**"Software Engineering Patterns for Machine Learning Applications (SEP4MLA) – Part 5 – Explainable Proxy Model"**

by Hironori Washizaki, Foutse Khomh, Yann-gaël Guéhéneuc, Hironori Takeuchi, Satoshi Okuda, and Naotake Natori

**"Classification of Human-Human and Human-AI Pair Programming Effects and Expansion for AI Pair Programming Patterns"**

by Yuma Takai, Hironori Washizaki, Nobukazu Yoshioka, and Yoshiaki Fukazawa

**Focus Group Reports**

**"Future-Self Immersion Workshop with Using a Pattern Language for Nurturing an Exciting Life: Focus Group Report"**

by Rio Nitta, Takako Kanai, Mizuki Ota, Sae Adachi, and Takashi Iba

**"Learning about Organizational Patterns from Drama Patterns"**

by Valentino Vranić, Aleksandra Vranić, and Branislava Vranić

# Conference Organization

## Program Co-Chairs

Valentino Vranić (Slovak University of Technology in Bratislava, Slovakia)

Kyle Brown (IBM, USA)

## Conference Chairs

Joseph Yoder (The Refactory, USA)

Richard Gabriel (Dreamsongs, USA)

## Games

Christian Kohls (TH Köln, Germany)

## Submission System

Michael Weiss (Carleton University, Canada)

## Program Committee

Ademar Aguiar  
Indu Alagarsamy  
Rosana Braga  
Kyle Brown  
Y C Cheng  
Filipe Figueiredo Correia  
Eduardo Fernandez  
Richard Gabriel  
Alejandra Garrido  
Alfredo Goldman  
Eduardo Guerra  
Neil Harrison  
Cecilia Haskins

Pavel Hruby  
Takashi Iba  
Christian Kohls  
MaryLynn Manns  
James Noble  
Waheedullah Sulaiman Khail  
Valentino Vranić  
Eugene Wallingford  
Hironori Washizaki  
Michael Weiss  
Rebecca Wirfs-Brock  
Joseph Yoder

## Shepherds

Ademar Aguiar  
Y C Cheng  
Eduardo Fernandez  
Richard Gabriel  
Alejandra Garrido  
Alfredo Goldman  
Eduardo Guerra  
Mohammad Daud Haiderzai  
Neil Harrison  
Cecilia Haskins  
Kiyoka Hayashi  
Stefan Holtel  
Pavel Hruby  
Lise Hvatum

Takashi Iba  
MaryLynn Manns  
Antonio Maña  
James Noble  
Waheedullah Sulaiman Khail  
Jenny Quillien  
Thomas Raser  
Rebecca Rikner  
Joseph Yoder  
Shakirullah Waseeb  
Hironori Washizaki  
Hans Wegener  
Michael Weiss  
Rebecca Wirfs-Brock