

October 22–27, 2011  
Portland, Oregon, USA



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# SPLASH

# OWARD'11

Proceedings of the 10th ACM Symposium on

**New Ideas, New Paradigms, and Reflections  
on Programming and Software**

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**ISBN: 978-1-4503-0941-7**

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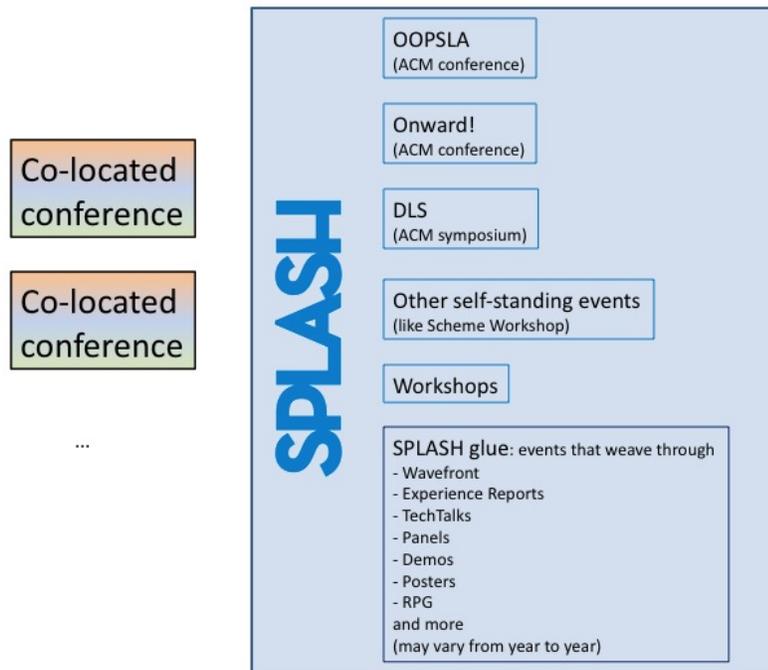


*Introducing the ACM International Conference on  
Systems, Programming, Languages, and Applications:  
Software for Humanity (SPLASH)*

Welcome to SPLASH! SPLASH is the new umbrella for OOPSLA, Onward!, and the Dynamic Languages Symposium. This year, SPLASH also hosts the Scheme Workshop. As usual, a couple of other conferences chose to co-locate with SPLASH; this year, we have the conference on Generative Programming and Component Engineering (GPCE) and the Pattern Languages of Programming conference (PLoP).

SPLASH has emerged from OOPSLA with the underlying drive to expand from it and to include more contributions than those that were typically accepted at OOPSLA. This transition didn't have a master plan; we tried several models for SPLASH and its relation to OOPSLA and Onward!. One of them was the "federated conference" model, like the ACM FCRC, where several existing conferences co-locate in the same place at about the same time. But that didn't feel quite right—there has always been a strong connection between OOPSLA, Onward!, and DLS. Separating them while co-locating them might make them compete with each other, which would be exactly the opposite of what we intended SPLASH to be.

We realized that conferences have many possible views: there are at least internal and external views. The internal view is what the ACM uses for accounting and administration purposes; for this internal view, separation is a good thing, because it keeps every single event financially independent and accountable. This is what the federated conferences model does. The external view is what the attendees see; from the attendees' point of view, separation of all these events in the form of separate registration fees is bad, because people prefer to flow freely from session to session without having to make upfront plans about what to attend. We realized that we needed an accounting model that served the attendees better than the federated conferences model does. So let me explain SPLASH with a picture:



In the picture, the SPLASH box and the co-located conference boxes denote accounting borders. What this means is that SPLASH accommodates several conferences and symposia (OOPSLA, Onward!, DLS, etc.) within one single accounting box; participants see a simple registration fee that doesn't separate the

different events, and whose price is proportional to the number of days that a participant decides to attend. As a consequence, during the SPLASH days, participants can freely roam to whatever sessions they want without having to register for individual events, which is exactly what all of us want to do!

There is one final detail concerning this arrangement: even though we are grouping conferences under the SPLASH administrative and accounting umbrella, we don't want to disturb the intellectual autonomy and branding of those conferences. We want the SPLASH conferences to continue to make their own decisions regarding topics, scope, and criteria for content selection, as well as produce their own separate proceedings. This is crucial for the success of the SPLASH model and the success of each of its conferences.

In short: SPLASH gives full autonomy to the different conferences in it, while minimizing their administrative overhead and serving participants the full spectrum of options about which parts to attend under one single registration fee. On top of this, it also supports the more traditional co-location model with other conferences that, for one reason or another, wish to remain financially independent. We hope that in the future more conferences join *the SPLASH* in whatever way they see fit.

Design conferences as you may, SPLASH is the premier conference for researchers, practitioners, educators, and students who are passionate about all aspects of software construction and delivery, and who seek to find deep insights about software that go beyond the shiny surfaces of the latest trends. There is no question that software is having a tremendous impact in Society. The SPLASH community should be proud of the fact that many of the technologies and methodologies that underlie modern software have emerged here at OOPSLA. I decided to choose a theme this year that captures the change in the order of magnitude of computing that happened over the past few years: *The Internet as the world-wide Virtual Machine*. We're operating at the global scale now. These days software systems are rarely designed in isolation; they connect to pieces written by 3<sup>rd</sup> parties, they communicate with other pieces over the Internet, they use big data produced elsewhere, they touch millions of interacting users through an ever larger variety of physical devices...in other words, the "machine" is now a global computing network. What does this entail for software development itself?

In this publication, you will find the collection of proceedings of the several sponsored conferences, as well as many papers and summaries of sessions that have a more informal arrangement within SPLASH. I believe we have assembled an impressive technical program, and I hope you enjoy it!

Organizing SPLASH was lot of work. The talent and enthusiasm of all the volunteers made it all possible. I am thankful, first of all, to the Organizing Committee — without them the conference would not have happened. I am grateful to the Program Chairs of the SPLASH conferences, symposia, workshops, and tracks who enlisted a large number of reviewers, and I am grateful to each and every one of those reviewers. Reviewing other people's papers is a time-consuming, largely thankless, task that ensures the intellectual health of any community. I am also grateful to the SPLASH Steering Committee for their guidance, to our corporate supporters for their trust, and to SIGPLAN and the ACM for sponsoring SPLASH.

**Crista Videira Lopes**  
SPLASH 2011 General Chair  
*University of California, Irvine*

## *Onward! 2011 General Chair's Welcome*

It is my pleasure to welcome you to the 10<sup>th</sup> Onward!. This year marks its first year as a *bona fide* SIGPLAN symposium; its proper name is **ACM Symposium on New Ideas in Programming and Reflections on Software**. Its familiar name, though, remains **Onward!**—with the exclamation point.

“New ideas in programming” means that we are interested in ideas that can move us forward or radically sideways. A good Onward! paper has two characteristics: readers will wish they had thought of it, and they will believe “it might just work.” We don’t expect detailed proof the idea will work, but we don’t accept pure claims. Onward! papers are well written, well argued, and compelling. They are generally bigger than technical papers, more radical, more visionary, wider ranging, more thought provoking, more frustrating even. Here is what they are **not**: ordinary OOPSLA papers with lousy validation.



“Reflections on software” means that sometimes the way forward begins by looking back and thinking hard, finding new (and better) ways to view what has gone before, in order to provide a new vector. We call such papers “essays.” Essays are reflective, often personal, and cover a lot of ground in unexpected ways. Essays are hard to write. Very hard to write. Over the years we have had a good number submitted, but only a scarce few accepted. Here is what they are **not**: ordinary OOPSLA papers with lousy validation.

We welcome submissions about every and any aspect of programming, software, and software engineering. When what you want to say doesn’t fit into the research papers or essays bucket, you can submit a film.

This year we accepted seven out of 23 research papers and five films for presentation and publications. While authors of research papers are proficient at writing technical papers, the essay form has proven to be more difficult, and this year, though we had 13 submissions, none were taken. We decided, then, that this year’s essays track take the form of a writers’ workshop in which a couple of good essayists will coach budding writers in the essay form.

Our keynote speaker is Markus Püschel who is well known for his work on **Spiral**, an automatic performance programming framework for a small, but important class of functions called linear transforms. In his talk he will draw attention to the performance / productivity problem for mathematical applications and make the case for a more interdisciplinary attack.

I wish to thank my organizing committee:

Eelco Visser, Research Papers Chair  
David West, Essays Chair  
Bernd Bruegge, Films Chair  
Pascal Costanza, Workshops Chair  
Tobia Pape, Web Chair  
Constanze Langer, Designer  
Richard P. Gabriel, Steering Committee Chair<sup>†</sup>

I am looking forward to an interesting and inspiring symposium.

**Onward!**

Robert Hirschfeld  
*Hasso-Plattner-Institut Potsdam*  
Onward! General Chair

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<sup>†</sup> Ever vigilant but (mildly) annoying.

## Onward! Program Chair's Welcome

It is my pleasure to welcome you to Onward! 2011, the ACM Symposium on New Ideas in Programming and Reflections on Software. At Onward! we are interested in papers that describe work with potential to change significantly the field. But Onward! is not a venue for just any old thing; an Onward! paper must say something substantially original, and must be sufficiently important and interesting to deserve the attention of the programming and software communities. An Onward! paper must present some supporting evidence, not pure conjecture. Evidence may be in the form of a compelling argument or analysis, a sketch of validity, or an initial implementation. The scope of an Onward! paper can be broad: It can be a single idea, a new approach, or a new paradigm. It can talk about programming languages, programming methodologies, process, software engineering, collaboration, and anything to do with programming and creating software. But above all, an Onward! paper must be well thought out, well-written, and compelling in its argument.

This year Onward! welcomed, in particular, papers reflecting on the future of software language design. Collectively the software language community is exploring the space of language designs. It often takes many years for a design (a point in this space) to be implemented, applied, and evaluated. Language design is very much an art. Can we speed up the process by more systematic methods? What properties do good language designs have? What are good language design patterns? How can we evaluate language design at an early stage, i.e., before an implementation exists? Can we (and should we) incorporate method from human-computer interaction in the evaluation of language designs? Can we use user-centered design methods to inform language design? Can programming language designers learn from the design methodologies of other disciplines such as architecture and industrial design? Are there principled ways to guide and evaluate software language designs other than empirical experiment and mathematical proof? What assumptions do we hold so dearly about programming languages that it would be heresy to question them?

The Programme Committee consisted of Jean Bézivin, Dave Clarke, Jonathan Edwards, Tim Finin, Robert Hirschfeld, Ralf Laemmel, Oscar Nierstrasz, Klaus Ostermann, Alex Payne, Lori Pollock, Jeremy Siek, Guy Steele, Tom Van Cutsem, Eelco Visser (chair), Markus Voelter, and Tao Xie. Additional reviews were provided by external reviewers Richard Gabriel, Jeehyun Hwang, Andoni Lombide Carreton, Jens Nicolay, Rahul Pandita, Fabrizio Perin, Jorge Ressia, Christophe Scholliers, Niko Schwarz, Yoonki Song, Andrei Varanovich, Toon Verwaest, Erwann Wernli, and Xusheng Xiao.

This year we received 23 submissions, of which 7 were accepted for publication in the proceedings and presentation at the conference. Together the Programme Committee and external reviewers wrote 74 reviews with at least three reviews per paper. The result is an exciting program including contributions to programming with touch devices, scripting of virtual worlds, interaction design for software languages, and the application of natural language concepts in programming languages.

Organizing *Onward!* required hard work from many individuals. I am very thankful for all the work performed by the Program Committee and the external reviewers, the organizing committee headed by General Chair Robert Hirschfeld, and last but not least, the authors of all submitted papers. I am grateful also to the Onward! Steering Committee for their guidance and support and to SIGPLAN and ACM for sponsoring the conference. Finally, I would like to thank all of the people who took part in *Onward! 2010*. Thank you!

**Eelco Visser**

Onward! 2011 Program Chair

*Delft University of Technology, Delft, The Netherlands*

## Onward! Essays Welcome

It is my pleasure to welcome you to *Onward! Essays* - a forum for interesting, challenging, and provocative ideas and insights. An essay is a narrative, often personal, of a new idea, how it came into being and any implications arising from the idea. It is well argued, but does not require the kind of detail expected of a technical paper.

While SPLASH and Onward! authors are adept at writing technical papers, the essay form has proven to be more elusive. This year the Essays Track will take the form of a writer's workshop followed by presentation and publication. This means more work, with tight deadlines, for the authors and the Essays Committee.

Onward! Essays has a tradition of introducing ideas that become important themes in future conferences. Join us for the opportunity to be among the "first to know," or to stimulate your own thinking and ideas, or simply to begin an engaging discussion.

I want to thank the members of the Essays Committee for their diligent and thoughtful work. This year's format meant even more work than was expected when they accepted the assignment and they deserve special recognition for their efforts.

**David West**

SPLASH 2010 Onward! Essays Chair  
*New Mexico Highlands University*

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