Dahl-Nygaard Prizes, 2016

The Dahl-Nygaard Prize Committee recommends that the prizes for 2016 be awarded to:
Senior Prize: James Noble (reserve: Gilad Bracha)
Junior Prize: Emina Torlak (reserve: Arjun Guha)

The prizes

James Noble

James Noble obtained his Ph.D. from the Victoria University of Wellington, New Zealand, in 1996 where he is Professor of Computer Science. He is a Fellow of the Institute of IT Professionals New Zealand, a Member of the Association for Computing Machinery, the British Computer Society and the Institute of Electrical and Electronics Engineers. He held a James Cook Research Fellowship from the Royal Society of New Zealand in 2015 and 2016. James is the founding Editor-In-Chief of the journal Transactions on Pattern Languages of Programming (Springer). He was the PC Chair of ECOOP 2012.

James has a world-leading reputation for his work on object-orientation. He has published over 300 papers. He is notable for his pioneering work in programming language design, especially through his contributions to novel type systems such as ownership types and pluggable types. He has contributed to object-oriented and aspect-oriented approaches to software design, design patterns and the analysis of software corpus, software visualisation and visual languages, user interaction and agile development methodologies. His writing on the philosophy of computer science is thoughtful and thought-provoking.

James is also an energetic and tireless member of the programming languages community. The Grace language, of which he is co-designer, is designed to introduce beginners to object-oriented programming in the simplest possible way. His service to the community is exemplary and exhaustive, as a thorough and supportive thesis advisor, and as a member of numerous program committees.

Emina Torlak

Emina Torlak obtained her M.Eng. (thesis: *Subtyping in Alloy*) and Ph.D. (thesis: *A Constraint Solver for Software Engineering Advisor,* 2009), both from MIT, advised by Daniel Jackson. She has held posts at IBM Research, LogicBlox and the University of California, Berkeley. Since 2014, she has been an assistant professor at the University of Washington, USA.

Emina has worked on developing tools and methodologies to help build better software more easily. She has built automated tools for analyzing and synthesizing all kinds of software artifacts, including specifications, programs, executions, test data, and memory models. She

has looked at how to refactor Java programs in a principled way, and at how to check memory model specifications such as that of the Java Memory Model.

Her *Kodkod* constraint solver for relational logic has been used in a wide range of applications, including code checking and test-case generation. It has had several significant applications in the object-oriented domain. For example, the MemSAT project relies on Kodkod for checking the complete Java Memory Model against its published test cases, the PBnJ project uses KodKod to extend Java with executable specifications, and the Rubicon project uses KodKod to enable reasoning about all Ruby objects of a given type without the need for explicit mock objects. In addition, KodKod forms the foundation of Alloy, a widely used language and tool for describing and exploring relational models. Kodkod has supported 11 PhD and MSc theses.

The decision making process

The committee considered all the nominees that had been proposed, either this year or last year. The committee drew on the text of nominations, metrics such as citation counts, and their own knowledge and judgement. The committee is very much aware of the limitations of metrics and considered these to be useful additional information but not a replacement for judgement.

In the first phase, the committee discussed nominations online, before shortlisting any names that they felt should go forward. I did not impose a limit on the size of the shortlist. I also asked committee members to put forward any names they felt merited further consideration regardless of conflicts. Here, the aim was simply to avoid further discussion of candidates who did not have sufficient support from the committee. Thus, no conflict had any bearing on the award of prizes.

Decisions on the Senior and the Junior prizes were made separately. For the Senior prize, it was unfortunate that half the committee had conflicts with one or other of the remaining candidates. However, we considered that this was a predictable consequence of having a small but well-connected committee. I address this below.

As the only members without conflicts with any shortlisted candidate, Frank Tip and I met on Skype to discuss the Senior Prize. We considered that both Gilad Bracha and James Noble would make fine prize winners. The runner-up would be a leading contender for the prize next year. However, our unanimous decision was to award the Senior Prize to James Noble. The whole committee supports this decision.

The whole committee met to consider the candidates shortlisted for the Junior prize. Again, we felt that there were many fine candidates; we would like to see these considered in future years, especially as their research has time to mature and its impact deepen. Our decision was to award the Junior Prize to Emina Torlak.

Recommendations

1. The nomination process.

The process for gathering nominations for the Dahl-Nygaard prizes is much more informal than that used for other prizes. While some nominations clearly stated the case for a candidate, in other cases the nominations were very brief. Indeed, we felt that some nominations were asking the committee to make the case for the candidate! We note that both ACM SIGPLAN and ACM SIGSOFT have more formal systems, that seek stronger nominations, require names of others who might be asked to comment on a nomination, and are backed by web-based systems.

There are few nominations for the prizes (at least in the last two years). Many of the nominations come from either committee members, the AITO executive, or other AITO members. This is not healthy for the long-term future of the prize. We believe that the prizes should be better promoted, for example at other OO or PL conferences, and maybe through an article on the history of the prize and its winners in, say, CACM. It should be made explicit that nominations are welcomed at any time of the year, and there should be a website dedicated to this.

We **recommend** that AITO consider introducing a more robust nomination process that should achieve the following.

- Require more detailed nominations that clearly set out the reasons for an award. This might also include a draft text for the citation, if the candidate were successful.
- Require the nominator to provide the names of others who should be approached to review the nomination;
- Be supported by a web-based system. This system should allow nominations to be made at any time of the year, and automatically solicit the supporting letters. We think it likely that either SIGPLAN or SIGSOFT would allow us to clone their system.

2. Conflicts of interest.

It was unfortunate that half of this year's committee had conflicts with a candidate in final contention for the Senior prize. However, this is a predictable consequence of having a small but well-connected committee. Of course, having a larger committee may make it harder/longer to reach a decision. An alternative might be to postpone the appointment of the prize committee until after the deadline for nominations. However, it would be difficult to identify conflicts without revealing the nomination list.

We **recommend** that AITO consider increasing the size of the prize committee. An odd number of committee members might help to avoid ties.

3. Eligibility for the Junior prize.

We are concerned that the fixed period of seven years since PhD graduation for the Junior prize may not provide a level playing field for all candidates, especially women who may have taken maternity leave in this period. Candidates may also have other circumstances that limit their contribution. Evaluatory systems such as the UK's Research Excellence Framework have detailed mechanisms to support equality, diversity and inclusivity. For example, rather than having to provide their 4 best outputs, researchers with special circumstances are permitted to submit fewer without penalty. Of course, it is much simpler to obtain (and verify) details of special circumstances when researchers essentially self-nominate (as in the REF) than for AITO when it seeks suggestions for prizes.

We **recommend** that AITO consider how to better support equality of opportunity in the award of the Junior prize.

Richard Jones (chair)
Andrew P. Black
Frank Tip
Tobias Wrigstad