# UC San Diego News Center

February 01, 2017    |    By Doug Ramsey

# Alumnus Honored for Work on Object-Oriented Programming Languages

A University of California San Diego alumnus in Computer Science, Ross Tate (Ph.D. '12), is one of two professors selected to receive the Dahl-Nygaard Prizes for 2017. The prizes are awarded annually by the Association Internationale pour les Technologies Objets (AITO).

Tate will accept the award at the 31st European Conference on Object-Oriented Programming (ECOOP) in June, set to take place in Barcelona, Spain. Now a professor of computer science at Cornell University, Tate will received the Dahl-Nygaard Prize for a "younger researcher who has demonstrated great potential for following in the footsteps of two pioneers in the area of programming and simulation."

*Computer Science and Engineering alumnus Ross Tate (Ph.D. '12) is a professor of computer science at Cornell University.*

The late Ole-Johan Dahl and Kristen Nygaard did foundational work on object-oriented programming, particularly with the Simula language – widely considered one of the most important inventions in software engineering. Both Dahl and Nygaard died in 2002.

AITO cited Ross Tate's "fundamental contributions to type systems with applications to object-oriented languages."

In highlighting his contributions, the association reached back to his landmark work while still a graduate student at UC San Diego. Published in 2011 at the Conference on Programming Language Design and Implementation (PLDI), Tate found that "although wildcards as in Java are undecidable in theory, programmers only use specific flavors of wildcards, which keeps them decidable in practice."

According to AITO, the 2017 prize also recognizes that Tate has had a "strong industrial impact via his involvement in the production languages Ceylon (Red Hat) and Kotlin (JetBrains)." For Red Hat, Tate says his "role on the team is primarily as type-system advisor, making sure Ceylon's powerful features all work together cohesively." He is also a type-system advisor to the JetBrains team, but notes that the "two projects are very different, both in how they operate, and in what they are working towards."

Then-Ph.D. student Tate did his dissertation at UC San Diego under CSE Prof. Sorin Lerner on "Equality Saturation: Using Equational Reasoning to Optimize Imperative Functions".

After completing his Ph.D. in 2012, Tate immediately joined the Cornell faculty and continued his research on wildcards and type systems. According to AITO, he later proposed that "F-bounded polymorphism can be replaced by simpler concepts that were sufficient for the use that programmers made of generics in a large corpus" (as outlined by Tate and co-authors in a paper presented at PLDI 2014).

Tate also discovered that Java wildcards and Scala path-dependent types, in combination with implicit null pointers, make the languages unsound. That discovery was presented in 2016 at the Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA) in Amsterdam. The UC San Diego alumnus also wrote a popular article on the unsoundness issue for the *Hackernoon* website. In "Java is Unsound: The Industry Perspective," Tate notes that the OOPSLA article was written for academics, so he drafted the popular article to discuss the issue – primarily focusing on Java –from the point of view of general developers in industry. (See related links below to read Tate's *Hackernoon* article.)

AITO also awards the Dahl-Nygaard Prize to a "senior researcher with outstanding career contributions". For the 2017 Senior prize, the association picked Google software engineer Gilad Bracha, citing his "outstanding work on many topics relevant to the field of object-orientation, including mixins, Java generics, Strongtalk and Newspeak."

---

MEDIA CONTACT

**Doug Ramsey**, , dramsey@ucsd.edu

UC San Diego's Studio Ten 300 offers radio and television connections for media interviews with our faculty, which can be coordinated via studio@ucsd.edu. To connect with a UC San Diego faculty expert on relevant issues and trending news stories, visit https://ucsdnews.ucsd.edu/media-resources/faculty-experts.