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ON CAMPUS AND AROUND THE WORLD



JuliaCon attendees gather in the amphitheater outside of MIT's Computer Science and Artificial Intelligence Laboratory.

## JuliaCon draws global users of a dynamic, easy-to-learn programming language

Now three years old, the Julia programming language is helping to solve problems in areas such as economic modeling, spaceflight, and bioinformatics.

**Deshpande Center for Technological Innovation**  
**July 18, 2016**

"Julia is a great tool." That's what New York University professor of economics and Nobel laureate Thomas J. Sargent told 250 engineers, computer scientists, programmers, and data scientists at the third annual JuliaCon held at MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL).

If you have not yet heard of Julia, it is not a "who," but a "what." Developed at CSAIL, the MIT Department of Mathematics, and throughout the Julia community, it is a fast-maturing programming language developed to be simple to learn, highly dynamic, operational at the speed of C, and ranging in use from general programming to highly quantitative uses such as scientific computing, machine learning, data mining, large-scale linear algebra, and distributed and parallel computing. The language was launched open-source in 2012 and has begun to amass a large following of users and contributors.

This year's JuliaCon, held June 21-25, was the biggest yet, and featured presentations describing how Julia is being used to solve complex problems in areas as diverse as economic modeling, spaceflight, bioinformatics, and many others.

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“We are very excited about Julia because our models are complicated,” said Sargent, who is also a senior fellow at the Hoover Institution. “It’s easy to write the problem down, but it’s hard to solve it — especially if our model is high dimensional. That’s why we need Julia. Figuring out how to solve these problems requires some creativity. The guys who deserve a lot of the credit are the ones who figured out how to put this into a computer. This is a walking advertisement for Julia.” Sargent added that the reason Julia is important is because the next generation of macroeconomic models is very computationally intensive, using high-dimensional models and fitting them over extremely large data sets.

Sargent was awarded the Nobel Memorial Prize in Economic Sciences in 2011 for his work on macroeconomics. Together with John Stachurski he founded [quantecon.net](#), a Julia- and Python-based learning platform for quantitative economics focusing on algorithms and numerical methods for studying economic problems as well as coding skills.

The Julia programming language was created and open-sourced thanks, in part, to a 2012 innovation grant awarded by the MIT Deshpande Center for Technological Innovation. Julia combines the functionality of quantitative environments such as Matlab, R, SPSS, Stata, SAS, and Python with the speed of production programming languages like Java and C++ to solve big data and analytics problems. It delivers dramatic improvements in simplicity, speed, capacity, and productivity for data scientists, algorithmic traders, quants, scientists, and engineers who need to solve massive computation problems quickly and accurately. The number of Julia users has grown dramatically during the last five years, doubling every nine months. It is taught at MIT, Stanford University, and dozens of universities worldwide. Julia 0.5 will launch this month and Julia 1.0 in 2017.

Presenters at JuliaCon have included analysts, researchers and data scientists at the U.S. Federal Reserve, BlackRock, MIT Lincoln Laboratory, Intel, Conning, and a number of universities around the world. In addition to a community of 500 contributors, Julia’s co-creators include Alan Edelman, professor of applied mathematics at MIT; Jeff Bezanson SM '12, PhD '15; Viral Shah, co-founder of Julia Computing; and Stefan Karpinski, co-founder of Julia Computing.

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