# AIChE Webinar Series

*Computing & Systems Technology Division (CAST) Welcomes*


## *Joel Andersson*

Visiting Assistant Scientist at
University of Wisconsin-Madison


THE UNIVERSITY of WISCONSIN MADISON

## *Dynamic Optimization Modeling using CasADi*

We introduce CasADi, an open-source numerical optimization framework for C++, Python, MATLAB and Octave. Of special interest are optimization problems constrained by differential equations, i.e. optimal control problems, both in an online and in an offline context. CasADi offers a flexible approach to optimal control, providing building blocks that simplifies the process of implementing efficient algorithms for optimal control, using methods such as direct multiple shooting and direct collocation. Since its inception in late 2009, CasADi has been used successfully for academic teaching as well as in applications from multiple fields, including process control, robotics and aerospace.
In this presentation we give a general introduction to the tool and discuss some key features that sets it apart from other optimization modeling tools; namely (1) efficient and fully automatic sensitivity analysis for initial-value problems in ordinary differential equations (ODE) and differential algebraic equations (DAE) and (2) structure-exploiting nonlinear programming.

Bio
Joel Andersson is a postdoctoral researcher in the group of James B. Rawlings at the Department of Chemical and Biological Engineering at the University of Wisconsin-Madison. After obtaining M.Sc. degrees in Engineering Physics and Engineering Mathematics from Chalmers University of Technology, he was a computational mathematician at the Institute of Biotechnology at the Jülich Research Center, followed by graduate studies in the group of Moritz Diehl at the Department of Electrical Engineering at KU Leuven. After obtaining his PhD degree, he worked as a self-employed industrial consultant using the main outcome of his PhD studies; the open-source optimization framework CasADi. His main interests are in the areas of computational methods for numerical optimization, in particular numerical optimal control, algorithmic differentiation and nonlinear model predictive control.

**Join Webinar on Nov 14, 2017 at 11 AM Eastern Time (EDT) at http://goo.gl/5ySqO4**

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