Contribution ID: **105**   Type: **Talk**

Efficient C++ Derivatives Through Source Transformation AD With Clad

Tuesday 25 July 2023 16:10 (20 minutes)

Clad enables automatic differentiation (AD) for C++. It is based on LLVM compiler infrastructure and is a plugin for Clang compiler. Clad is based on source code transformation. Given C++ source code of a mathematical function, it can automatically generate C++ code for computing derivatives of the function. Clad supports a large set of C++ features including control flow statements and function calls. It supports reverse-mode AD (a.k.a backpropagation) as well as forward-mode AD. It also facilitates computation of hessian matrix and jacobian matrix of any arbitrary function.

In this talk we describe the programming model that Clad enables. We explain what are the benefits of using transformation-based automatic differentiation in high-performance static languages such as C++. We show examples of how to use the tool at scale.

Author: VASILEV, Vassil (Princeton University (US))

Presenter: VASILEV, Vassil (Princeton University (US))

Session Classification: Progress in Computer Science

Track Classification: Computer Science