

# Mini-Workshop: Differentiable Programming for High-Performance, Data-Intensive Computations

## *Introduction*



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# Welcome

Automatic Differentiation (AD) refers to a general way of taking a program which computes a value, and automatically constructing a procedure for computing derivatives of that value by applying the chained rule of differential calculus. Implementations can alter the computational complexity from program input values to its output values which leads to superior execution performance. AD is an essential tool in numerous scientific and industry domains.

Goals of the Mini-Workshop:

Share Knowledge

Understand broader AD problems and application domains

Networking

Form future partnerships

# Agenda

[17:00-17:15] Introduction

[17:20-17:40] Post-Optimization Automatic Differentiation by Synthesizing LLVM

[17:50-18:10] Domain-Specific Automatic Differentiation for GLSL with LLVM

[18:20-18:40] Clad — Automatic Differentiation for C++ Using Clang

[18:50-19:10] Use of auto-differentiation within the ACTS toolkit

[19:30-19:50] Wrap-up / next steps

20+5'/talk ~ 3 hours intensive but exciting content!

# Quick Round of Introduction

How about — Name, Organization, Experience in the field, What do you need AD for, What do you expect from this event...

[Depending on the attendance we can do it via voice, or zoom chat]

**Thank you.**