

# **XAD Hackathon 2024: Push the Boundaries of Computing!**

## **Join Us to Innovate and Win Big!**

**When:** 11-17<sup>th</sup> November 2024

**Where:** 1337 (Khouribga Campus)

**Codebase:** [XAD on GitHub](#)

We're thrilled to host the XAD Hackathon at 1337! This event invites the brightest minds in software development, data science, and quantitative finance to enhance XAD, an advanced open-source C++ automatic differentiation tool essential for high-performance computing.

**Challenge:** Enhance the computational performance of XAD by at least 10% across selected applications.

**Goal:** Amplify XAD's contributions, visibility, and scout top-tier talent.

## **Why Participate?**

- **Compete for Cash Prizes:**

- **1st Place:** MAD 30,000
- **2nd Place:** MAD 20,000
- **3rd Place:** MAD 10,000

Note: Cash prizes will only be awarded if the computational performance of XAD is enhanced by at least 10% across the selected applications.

- **Learn and Grow:** Take advantage of expert-led workshops and mentorship sessions designed to enhance your skills and prepare you for the hackathon. We're offering two pre-hackathon workshops that will provide you with the tools you need to succeed:

- **Algorithmic Differentiation:** Learn how algorithmic differentiation of computer programs works and get an overview of XAD's internals.
- **Test-Driven Development (TDD) in C++:** Gain a solid understanding of TDD principles and how to apply them effectively in C++ projects.
- **C++ Profiling and Performance Tuning:** Learn how to optimise your code's performance with advanced profiling techniques and tuning strategies.

In addition to these pre-hackathon sessions, there will also be workshops during the hackathon itself, giving you ongoing opportunities to learn, refine your project, and receive guidance from experts.

- **Community and Networking:** Connect with like-minded individuals.

## **Participant Prerequisites:**

- Familiarity with Automatic Differentiation; start here: [Automatic Differentiation Background](#)
- GitHub account for contributions

- Skills in C++, performance tuning, and calculus
- Teams of up to 3 members, aiming for at least 10 teams and maximum of 12 teams

### **Evaluation Criteria:**

- Start from the current main branch of XAD
- Adhere to XAD coding style guidelines
- Pass all CI/CD tests on all platforms
- Match baseline derivatives with a max relative error of  $10^{-5}$
- Full test coverage for new code
- Adherence to copyright laws
- Expert approval of code quality and correctness
- Consistent use of XAD version across all applications
- Unmodified core compute code of test applications

**Winning:** Achieve the best average performance improvement of at least 10% across three selected applications.

**Registration:** Please register via [this form](#) by 29<sup>th</sup> September 2024. A pre-selection challenge will take place shortly after the registration deadline.

### **Timeline:**

- 29<sup>th</sup> September: Registration deadline
- 30<sup>th</sup> September – 6<sup>th</sup> October: pre-selection challenge
- 11<sup>th</sup> October: Automatic differentiation workshop
- 18<sup>th</sup> October: Test-driven development workshop
- 25<sup>th</sup> October: Profiling and performance-tuning workshop
- 11<sup>th</sup>-17<sup>th</sup> November: Hackathon

**Organisers:** The XAD Hackathon 2024 is proudly co-organised by **Xcelerit** and **1337**.

**Let's hack the limits of computational efficiency together - see you at the XAD Hackathon 2024!**

**About Xcelerit:** Xcelerit is a leading provider of cutting-edge analytics solutions for Quantitative Finance, Engineering, and Research. Their mission is to accelerate the pace of business, innovation, and scientific discovery. With extensive experience, Xcelerit offers comprehensive solutions including expert training, advisory, and bespoke products. The company has been recognised as a finalist in the Red Herring Europe Top 100 and Global 100 awards and is the only two-time winner of HPCwire's "Best use of High Performance Computing in Financial Services" award. Xcelerit's clients include leading firms in investment banking, asset management, and insurance, and the firm collaborates closely with technology giants like IBM, Intel, and Nvidia.