



# Intern with Oracle Labs Graph-in-DB!

The Graph-in-DB team at Oracle Labs, which focuses on adding graph support to the Oracle Database, has open internship positions available.

## Oracle

Oracle, a global provider of enterprise cloud computing, is empowering businesses of all sizes on their journey of digital transformation. Oracle Cloud provides leading-edge capabilities in software as a service, platform as a service, infrastructure as a service, and data as a service.

Oracle's application suites, platforms, and infrastructure leverage both the latest technologies and emerging ones – including artificial intelligence, machine learning, blockchain, and Internet of Things – in ways that create business differentiation and advantage for customers. Continued technological advances are always on the horizon.

## Oracle Labs

Oracle Labs is the advanced research and development arm of Oracle. We focus on the development of technologies that keep Oracle at the forefront of the computer industry. Oracle Labs researchers look for novel approaches and methodologies, often taking on projects with high risk or uncertainty, or that are difficult to tackle within a product-development organization. Oracle Labs' research is focused on real-world outcomes: our researchers aim to develop technologies that will someday play a significant role in the evolution of technology and society. For example, chip multithreading and the Java programming language grew out of work done in Oracle Labs.

## Oracle Labs Graph-in-DB

Graphs constitute a powerful tool to efficiently leverage latent information stored inside data connections. As the number of connections grows exponentially in today's increasingly common Big Data, being able to process graphs at scale is more and more relevant.

Oracle Labs Graph-in-DB is a project that aims at adding scalable graph processing support in the Oracle Database. Graph-in-DB is an ambitious project which leverages knowledge from various domains of computer science, such as databases, graphs, algorithms and data structures, tuning and performance, multicore and distributed computing, machine learning, and compilation. It involves a significant research and design effort, as well as challenging engineering tasks. The Graph-in-DB project is also a great opportunity to gain unique software development experience as it takes place in an exceptionally large and complex system.

## Internship Details

Internship topics include, but are not limited to:

- Exploring scalable execution of graph algorithms and queries over graphs that are partitioned across several machines.
- Exploring latest techniques to autonomously exploit available graph indexes in complex analytical queries.
- Exploring hybrid execution (on-disk + in-memory) of graph queries and algorithms.
- Extending a compiler for a graph-centric domain-specific language.
- Exploring possible performance optimizations for graph algorithms and queries, as well as graph loading.

As an intern, you will participate in the design, implementation and evaluation of at least one component of the system, and you will give informal and formal presentations on the progress and results obtained during the course of the internship.

## Qualifications

The successful candidate is expected to complete the internship using a wide and diverse set of skills.

## Required Skills

- Thorough understanding of computer science fundamentals including data structures, algorithms and complexity analysis
- Good problem-solving skills
- **Advanced C programming**

## Preferred Skills

- Familiarity with version control systems
- Good understanding of SQL
- For compiler-related topics: software language development experience through hands-on coding in a language workbench such as Spoofox, MPS, or xText

## Desired Skills

- Notions of database architecture
- Previous experience with development in a large system

For more information about the internship, contact Jean-Pierre Lozi ([jean-pierre.lozi@oracle.com](mailto:jean-pierre.lozi@oracle.com)).

“Oracle Labs is a great place to perform meaningful research which can directly impact the industry. Projects are well supervised, and the people are always there to help you in order to end up with a successful project.”

**Mikael Morales**  
Former EPFL student,  
6-month intern

## Related Topics

Our group at Oracle Labs further offers various internship topics in the following areas:

- Automated Machine Learning with Explainability (AutoMLx)
- Automating OCA Verification of GitHub Pull Requests
- BPF Linux Schedulers
- Extending a Distributed Graph Engine (Oracle Labs PGX)
- Extending a Web-Based Enterprise Data Science Platform
- Graph Machine Learning at Oracle
- Machine Learning and Data Analysis Techniques for Domain Global Graphs
- Machine Learning for Optimizing Oracle Database Performance
- Machine Learning Processing in DB Systems
- Oracle Database Multilingual Engine - Modern Programming Languages in the Database

If you are interested in more than one of these areas, it is sufficient to apply once. In our interview process, we are going to take all your areas of interest into account.