



# PostDoc in Computer Science: mQoL-Lab DevOps Software Developer for Mobile Sensing

**Deadline: 9 December 2022**

## Main responsibilities include:

- Managing own research within the QoL Lab scope (including students, papers, proposals etc.)
- Suggesting additional mQoL-Lab specifications and determining operational feasibility
- Executing full lifecycle software development and deployment in real-life settings with users

## Summary

We are looking for a motivated post-doctoral student who will contribute as a senior researcher and a developer (DevOps) to the design, development, and deployment of the mQoL-Lab software infrastructure (mqol.unige.ch) created for research purposes at the Quality of Life (QoL) technologies laboratory at the University of Geneva, Switzerland. The QoL Lab (qol.unige.ch) is a pioneer in mixed-method (quantitative-qualitative) studies combining ubiquitously advanced data collection methods (from smartphones, wearables and via various self-report methods), machine learning processes and data analytics to quantify and enhance daily human behaviours, wellbeing, and quality of life in the long term. This position includes designing of own research projects within the QoL lab scope and gathering the user requirements, defining system functionalities, and operationalizing these by writing Kotlin, Flutter, and Python code, as well as its proper documentation. The candidate must also have experience with databases (NoSQL and SQL type), platforms like Firebase, Docker for deployment and Git for code versioning and development workflow. Ideal candidates have experience developing smartphone applications for Android and/or iOS. The candidate must be able to translate the research needs into technical requirements.

The candidate is expected to document their own research in quality papers, written in a collaboration with the QoL's group members. This role sits centrally within the lab, offering a diverse perspective and a vast array of challenges, such as consulting on the technical feasibility of the existing research projects and new research proposals. We embrace testing and learning by continuously experimenting, analysing and improving our infrastructure which has helped the QoL Lab become an expert in mobile sensing and wellbeing research "in the wild".

## Formal Requirements

At this time, **only applications from EU/Swiss students** can be considered. Applicants should hold a PhD degree in computer science or related fields with a strong publication record. Courses, projects and experience in statistics, machine learning, data mining, computer networks, mobile/web technologies, or algorithmic programming applied in the health- or biology-related domains are welcome. The French language skill is welcome.

The initial contract will be signed for one year with the possibility of prolongation for another year. There is a probation period of 3 months.

## Application Elements and Procedure

- Detailed CV and Publication List including Google Scholar profile link (up to date)
- Motivation letter including summary of own research project (1 page)
- Diploma and transcripts of records (BSc, MSc and Ph.D.)
- Other information for consideration, e.g., Github repository address
- Full contact details (name, full affiliation, and email) of 3 relevant referees

The application, in English, in one file, must be submitted electronically to Prof. Katarzyna Wac with the subject line "PostDoc in Computer Science Dec 2022"

The University of Geneva is committed to creating an inclusive work environment with a diverse workforce. All qualified applicants will receive consideration for employment without regard to race, religion, gender, sexual orientation, national origin, disability, or age.

## Frequently Asked Questions

What is the technical context are the projects you will tackle?

The QoL Lab has developed its own Android mobile sensing software<sup>1</sup> to collect passive and active (self-reported, peer-reported, via a PeerMA method<sup>2</sup> and performance-reported) data from smartphones (Android) and passive (e.g., physical activity, heart rate, sleep) and active (e.g., ECG) data from wearables. The mQoL-Lab infrastructure supports the data collection based on an open-source solution (ParsePlatform). We are now extending our mobile sensing solution to iOS. As such, we are developing a new mobile sensing application in Flutter to support both operating systems and reduce the maintenance of two different code bases. You will participate in the development of this application in the context of your research.

What does the position entail?

You will need to define your own research project and contribute to the design and iterative development of the existing mQoL-Lab infrastructure. You will need to understand the problem presented by the stakeholders (i.e., collaborating experts from clinical or other domains) and propose a clear design to solve them. You will need to clearly communicate with a non-technical public, adapting your presentation and narrative to suit the stakeholders. The day-to-day activities at the lab will change based on the projects and the deadlines linked to publications submission, grant proposals and studies timelines.

What are the main duties and responsibilities?

With your research, you will contribute to the design, development, and evaluation of extensions for mobile sensing applications and backend infrastructure supporting the QoL group's research. The mobile application is deployed in Flutter and integrates multiple sensing components to collect the study participants' data in situ. As such, one challenge you will have is to optimize the passive data sensing, without impacting the smartphone user's day-to-day interactions with their device. The backend supporting the data collection is written in Kotlin.

The QoL Lab works with sensitive and private data of the research studies' participants. The protection of these data, enabling our research, is one of our priorities. You will be responsible for designing and maintaining applications with a high level of protection against data leakage.

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<sup>1</sup> A. Berrocal, V. Manea, A. D. Masi, and K. Wac, "mQoL Lab: Step-by-Step Creation of a Flexible Platform to Conduct Studies Using Interactive, Mobile, Wearable and Ubiquitous Devices," *Procedia Computer Science*, vol. 175, pp. 221–229, Jan. 2020, doi: 10.1016/j.procs.2020.07.033.

<sup>2</sup> A. Berrocal, W. Concepcion, S. D. Dominicus, and K. Wac, "Complementing Human Behavior Assessment by Leveraging Personal Ubiquitous Devices and Social Links: An Evaluation of the Peer-Perceived Momentary Assessment Method," *JMIR mHealth and uHealth*, vol. 8, no. 8, p. e15947, 2020, doi: 10.2196/15947.