
INTERNSHIP/MASTER THESIS in Zurich. Join our team as intern and you will find a young, dynamic and culturally diverse working environment.

PRIVACY -PRESERVING MACHINE-LEARNING FOR THE INSURANCE INDUSTRY

DESCRIPTION SUMEX builds an innovative and market leading solution for Swiss medical invoice verification. Major accident and health insurers in Switzerland rely on SUMEX to detect mistakes and irregularities in medical invoices.

For our next-generation SUMEX Analytics Platform, we are going to offer machine learning (ML) services that are trained on the combined data of multiple insurers. This collaborative approach provides higher value than traditional ML models, which are trained on isolated data repositories.

However, the insurance market in Switzerland is competitive and subject to strict data protection regulations. Different insurers (data controllers) may be unable or unwilling to share data about their customers (data subjects). Therefore, we want to explore the design of a distributed, and privacy-preserving Federated Learning (FL) platform.

With this initiative we aim to offer new ML services to Swiss insurers that:

- › Provide high business-value.
- › Encourage potentially competing data controllers to offer data access.
- › Protect the data of the data subjects from unauthorized access.

Challenges: This is a joint project of ELCA's data science team and the SUMEX analytics team. You will closely collaborate with both. To be successful, you will need to learn about medical invoicing and understand the Analytics Platform's architecture. It will be crucial to catch up with the current state of research. This will allow you to tackle at the same time the problems of data privacy and improving the performance of SUMEX's ML services.

What you will learn: You will take the role of a junior data scientist exploring the emerging field of privacy-preserving federated learning. You will experiment with state-of-the-art ML approaches to tackle real-world problems. You will evaluate the models and assess how collaborative learning benefits the participants.

Keywords: Machine-Learning, Deep Learning, Federated Learning, Collaborative Learning, Distributed Learning, Data Security, Data Privacy

OBJECTIVES

- › Design a PP-FL concept for the SUMEX Analytics Platform
- › Implement & Evaluate a Prototype ML Service based on existing FL technology.
- › (Extension) Implement & Evaluate privacy preserving protocols for the prototype.

KNOWLEDGE / SKILLS REQUIRED

- › Knowledge: Machine Learning, Distributed Computing, Probability Theory
- › Skills: Python, ML Frameworks, Software Engineering, Willingness and ability to understand the scientific background

ABOUT ELCA ELCA is one of Switzerland's biggest Information Technology Companies. Since the company was founded in 1968, we have offered our customers a single source for the complete spectrum of IT services including consulting, development and operations. Our team of over 1700 specialists advises companies on the best use of modern information technologies, develops and implements efficient and stable solutions and applies our know-how to ensure excellence in use. The company, with branches in Lausanne, Geneva, Berne, Zürich, Basel, Rapperswil-Jonas, London, Munich, Amsterdam, Paris, Madrid, Ho Chi Minh City and Mauritius (off shore development), Granada (near-shore development) all operating according to a common process framework.

IF YOU ARE INTERESTED in applying for this position, please send us your complete application (CV, Cover letter, letters of reference, B.Sc./M.Sc. transcripts, diplomas and certificates).

