



**SWISS
DIGITAL NETWORK**

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DIGITAL INNOVATION ACADEMY

EMPOWERING PEOPLE WITH ESSENTIAL DIGITAL SKILLS

DIGITAL INNOVATION ACADEMY

The Academy comprises experienced trainers, academicians, engineers, and scientists who work collaboratively with Swiss and international university experts to develop training courses and materials. The courses cover key digital capabilities such as **Site Reliability Engineering (SRE), Machine Learning Operations (MLOps), and Innovation.**

Our Academy is committed to **democratizing access to digital transformation knowledge and skills** to empower businesses and organizations of all sizes.

Empower Yourself with Cutting-edge Digital Skills and Knowledge

At Digital Innovation Academy, we empower individuals and organizations to thrive in the fast-paced digital world. Our academy is designed to equip you with the **skills, tools, and mindset** necessary to succeed in the digital age.

We offer a wide range of courses and programs that cater to your needs, whether you are a beginner looking to develop foundational skills or an experienced professional seeking advanced training.

Our expert instructors are industry leaders and academics with extensive experience in their respective fields; they bring **real-world knowledge and expertise** to the classroom.

Our courses are designed to be **flexible and customized** to your needs and environments and to leverage your team's learning experience.

Learning is a lifelong process, and we are committed to helping you stay current and competitive in the rapidly evolving digital landscape.

Our courses, workshops, and coaching sessions can be delivered **online or on-site, are public or customized training programs.**

We take your professional constraints into consideration to fit your unique needs.



Machine Learning for DevOps



OBJECTIVES



Help professionals in DevOps, SRE, Testing and CI/CD field to use ML techniques and algorithms to automate quality analysis and troubleshooting during the DevOps processes as well as predict and prevent potential issues before they occur.

BENEFITS



Allow DevOps teams to leverage the insights generated by ML models to make informed decisions about how to optimize and improve their processes (quality, speed, agility and cost effectiveness).



Prerequisites

- Python
- Being comfortable with command Line
- Prior programming experience (at least 1+ year)



Audience

- DevOps, CI/CD, Testing & SRE Engineers
- Software Researchers interested in DevOps & machine learning fields.

Why learn ML for DevOps



- Activity data from 'DevOps tools' (like Git, Jenkins, etc.) provides visibility into the delivery process.
- Applying ML can uncover anomalies in that data – large code volumes, long build times, slow release rates, late code check-ins

Tracking Application Delivery

Testing & QA

By analyzing output from testing tools, ML can intelligently review QA results, detect novel errors, and effectively build a test pattern library based on discovery

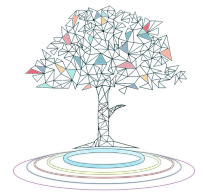
DevOps teams can use ML to analyze 'normal' patterns – user volumes, resource utilization, transaction throughput – and subsequently detect 'abnormal' patterns (e.g., DDOS conditions, memory leaks, race conditions, etc.).

Managing production

Preventing production failures

- ML can go well beyond straight-line capacity planning in preventing failures.
- ML can map known good patterns of utilization to predict, for example, the best configuration for a desired level of performance.

Your learning journey



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Module 1

Introduction to ML for DevOps

- How to apply ML in DevOps
- Build and compare end-to-end ML models for service reliability prediction
- Understand and learn how to use Machine Learning concepts

Module 2

Time series

- Discover Time series concepts and different models
- Use forecasting as a predictive model in Time Series analysis

Module 3

NLP (Natural Language Processing)

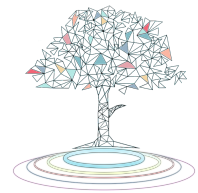
- Understand the concepts of Natural Language Processing
- Build an NL end-to-end application (from modeling to packaging)

Optional

Certification

+ 1 day training to prepare the CDOSS

Learning modules



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Introduction to ML for DevOps

1

1 Why ML for DevOps

Understanding the significance of applying Machine Learning to DevOps processes is the foundational insight that sets the stage for the entire course.

2 Introduction ML Concepts

Exploring the key concepts of machine learning, including regression, classification, and clustering, providing a comprehensive foundation for practical applications.

3 Lab: Building ML Models



Participants will engage in a hands-on session to build and compare end-to-end ML models for service reliability prediction.

2

Time Series

1 Introduction to time series concepts and models

Exploring the key concepts and advanced models within the domain of time series analysis, laying the groundwork for practical applications.

2 Lab: time series forecasting



Engage in a hands-on session focused on time series forecasting, providing participants with insights into advanced data modeling and predictive analytics.

3

Natural Language Processing (NLP)

1 Introduction to NLP Concepts

An in-depth exploration of the concepts underpinning Natural Language Processing, providing a strong foundation for practical application.

2

NLP Log Classification Lab (Security)



Engage in a hands-on session focused on log classification and security measures within the context of NLP.

3

Creating RestAPI for NLP Model

Participants will dive into the development of a RestAPI for NLP Models using FastApi, gaining practical skills for real-world applications.

Labs & Techniques



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Lab 1 - The QWS

1

Applications - the DataSet can be used for

Service Quality Classification

Algorithms

- Logistic regression
- Knn
- Decision tree
- Random Forest



Regression use case:
Service Reliability Prediction

Algorithms

- Linear regression
- Huber regression

Clustering use case:
Service Quality Clustering

Algorithms

- kmeans
- meanshift

2

Lab 2 - Ec2 CPU utilization



Context

This DataSet is introduced in Kaggle.

Benchmark: [Labeled Anomaly Detection TS \(kaggle.com\)](https://www.kaggle.com/datasets/awoiaf97/labeled-anomaly-detection-ts)

Description

The data contains 3 attributes:

- Timestamp
- Value
- Label

Applications

This DataSet will be used for: Time series Workshop

- Algorithms: Autoregressive Moving Average (ARMA); Autoregressive Integrated Moving Average (ARIMA); Prophet

Lab 3 - The Web Logs DataSet

3

Context

This DataSet is introduced in Kaggle. It contains logs informations of a web application.

Applications

This DataSet will be used for: NLP Workshop
(Log Classification)

- Text Representation
- One hot encoder
- Bag of words
- N-Gram
- TF-IDF
- Word
- Embeddings (Word2Vec, GloVe, Fast Text)





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CONTACT US

To enroll in our Machine Learning for DevOps Course or for any questions,
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