Deutsches Forschungszentrum
für Künstliche Intelligenz
German Research Center for Artificial Intelligence

Master's Thesis (m/f/d) in the AI-DISCO Project

Change-Aware Anomaly Detection for Monitoring Distributed Edge-Cloud AI Systems

Within AI-DISCO, the DFKI Intelligent Networks research department investigates monitoring for distributed AI services. Model updates and deployment changes can alter normal operating conditions and trigger false alarms. This thesis explores anomaly detection that uses these changes as context.

The research question

Can incorporating known model and deployment changes reduce false alarms when monitoring distributed AI services while maintaining fault detection rates and detection speed?

Your tasks

- Prepare time series of selected data, model and operational metrics, and link them to recorded model and deployment changes.
- Implement statistical and established ML baselines. Develop an ML approach that incorporates change context through features or detector adaptation.
- Build a reproducible benchmark for one AI service. Evaluate planned changes and controlled faults, including cases where both occur together.
- Evaluate false alarm and detection rates, detection delay and monitoring overhead. Test generalisation to previously unseen changes.

Your qualifications

- Master's student in AI, computer science, data science or a related field
- Python experience and basic ML knowledge. Interest in time series analysis or anomaly detection
- Independent scientific working style and a good command of English

What we offer

Individual technical guidance at DFKI and insights into AI monitoring within AI-DISCO. You will study a clearly defined use case and develop a benchmark and an evaluated ML prototype to support the WP5 monitoring strategy.

Interested in this thesis?

Send your CV, current transcript of records and earliest possible start date to jan.novacek@dfki.de.
For questions about the topic, contact Dr. Jan Novacek at +49 631 2057 57092.

The German Research Center for Artificial Intelligence (DFKI) combines scientific research with application-oriented development in artificial intelligence.

We welcome applications from people of all genders and backgrounds.



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Thesis arrangements

Planned duration: six months
Start date by agreement

University supervision and formal examination requirements must be agreed before registration.

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