

KhuK-Pläne

Big Data Analytics

Basierend auf den Entwicklungen von Erum-Data-Pilot (IDT-UM) möchten die KhuK-Teilnehmer die begonnenen Projekte weiterentwickeln und verbessern.

Eines der Schwerpunktthemen ist Big Data Analytics für FAIR und ALICE.

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Big Data Analytics Proposal

Teilnehmende Institute (keine vollständige Liste)

- GSI
- Helmholtz Institut Mainz
- Goethe Universität/FIAS Frankfurt
- Johannes Gutenberg Universität Mainz
 - TU Darmstadt
 - (Ruhr-Universität Bochum)
 - Universität Münster
 - Universität Heidelberg
 - Universität Dortmund

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Big Data Analytics Proposal

Arbeitsthemen (keine vollständige Liste)

- online processing at Tier0
- applications of multivariate analysis (MVA) and machine learning (ML) methods to data analysis
- novel deep learning approaches for track finding
- adapt algorithms for being able to use vectorisation (SIMD registers)
- data structures allowing parallel streams
- Detektorpermanentüberwachung via ML

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Big Data Analytics/Weitere Themen

- Detektorkalibrierung und Monitoring in Echtzeit mit neuronalen Netzen, optimiert mit GPU-Hilfe

Speziell: Korrektur von Raumladungseffekten in ALICE TPC

- Bridges from QCD to experimental data sets in hadron physics (M. Lutz, TUD)
- ...

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Big Data Analytics/Weitere Themen

- PI: A. Redelbach / V. Lindenstruth (FIAS)
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- Topic: Data reduction
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- Highly efficient data selection and usage of resources has a key role to
- process the increasing amounts of data in today's experiments. In fact,
- data reduction forms the basis for future discoveries in various fields of
- science in the era of next-generation big data. Reduction of data volumes
- at different stages at hardware and software level requires in-depth
- studies of computing platforms. Focusing particularly on high-performance
- aspects, **we will develop algorithms for data selection and reduction**
- **targeting cross-disciplinary solutions.** Based on our experience in the
- development of the ALICE High Level Trigger and also the First-level Event
- Selector at the FAIR Green-IT data center, we will generalise our previous
- developments and mechanisms for data reduction. Applications in a broad
- range of sciences are envisaged, ranging from the fields of KHuK, KET and
- KAT to life sciences.

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Big Data Analytics/Weitere Themen

- Development of Generic Tracking Algorithms (I. Kisel, J. Albrecht, R. Strozka, S. Hansmann-Menzemer)
- Universität Dortmund, Universität Heidelberg, FIAS
- Für CBM, LHCb
- Siehe Vortrag in dieser Session