Daniil Ponomarenko

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Work Experience

CERN, ATLAS **May 2022 – current**

TRT Run Coordinator *Genève, Switzerland*

- Entrusted with a critical leadership role, securing seamless real-time operations of the TRT subsystem, and ensuring optimal functionality and accurate data acquisition throughout ATLAS runs.
- Served as the principal interface between the TRT project and ATLAS, facilitating smooth communication, collaborative efforts, and synchronisation between project directives and operational activities.
- Proactively intercepted all operational exceptions, adeptly prioritising and delegating them to relevant TRT experts, ensuring timely and effective resolution to maintain uninterrupted run consistency.
- Executed thorough daily analyses of shifters' reports and data quality, alongside various other reports, ensuring all operations and data integrity were strictly in adherence to established protocols and standards and ensuring continuous, flawless TRT operation.
- Crafted and disseminated daily and weekly operational plans that were pertinent to the TRT crew, ensuring clear task directives, efficient resource allocation, and adherence to project timelines.

CERN, ATLAS **November 2016 – current**

TRT Data Acquisition Expert *Genève, Switzerland*

- Spearheaded the development and meticulous maintenance of both online and offline software associated with the TRT Trigger & Data Acquisition (TDAQ), including rigorous testing, commissioning, operation, and ongoing system maintenance.
- Awarded the ATLAS Outstanding Achievement Award in 2020 in recognition of contributions to TDAQ upgrades, enabling TRT operation at high occupancy and trigger rate.
- Played a crucial role during LS3 system enhancements, conducting a meticulous refactoring of TRT TDAQ software using CPPcheck and Valgrind to ascertain its precision and stability.
- Minimised TRT dead time and mitigated data losses by optimising TRT TDAQ software logic, ensuring smoother operation and improved data integrity during crucial operational periods.
- Collaborated closely with TRT hardware developers to address emerging issues.
- Facilitated TRT integration with other ATLAS sub-systems as an on-call expert, and actively participated in daily operational activities, consistent software maintenance, and operative hardware replacement under demanding conditions.
- Teamed up with other experts to guarantee unwavering support and steady operation of the TRT system, delivering 24/7 assistance and expertise.
- Engaged in crucial operations within radiation zones, including the ATLAS toroid area, consistently ensuring project continuity by undertaking work during nighttime, Sundays, and public holidays.
- Regularly enhanced and updated the TRT Documentation Portal, a critical resource for the TRT TDAQ team, ensuring a streamlined, accessible, and comprehensive repository of playbooks and instructions.
- Provided guidance and mentorship to new TRT fellows and students, bolstering team expertise and facilitating knowledge transfer.

CERN, Test beam studies of the TRD prototype **May 2016 – August 2021**

Data Acquisition Expert & IT Infrastructure Specialist *Genève, Switzerland*

- Engaged in comprehensive dialogue to understand physicists' requirements, translating complex scientific needs into actionable technical specifications and ensuring that the TDAQ infrastructure adequately supported all experimental prerequisites.
- Implemented and deployed an ATLAS-based TDAQ infrastructure for the TRD prototype, incorporating both data acquisition and advanced monitoring features.
- Acquired hands-on experience with standard form factors and bus protocols, specifically in employing NIM logic for trigger configurations. Proficiently used a VME-based CORBO Trigger Unit, alongside two QDCs and one TDC, achieving 64 channels and 16 multi-hit channels respectively.
- Developed and maintained custom Data Quality monitoring infrastructure using C++, ensuring accurate and reliable data representation throughout the operational period.
- Organised and managed data storage solutions to effectively handle, process, and maintain acquired data throughout the testing and operation periods.
- Implemented setup infrastructure monitoring utilising OpenStack, Prometheus and Grafana, ensuring optimal performance, reliable data management, and timely issue resolution across all operational aspects.

- Managed intensive two-week data-taking periods annually, overseeing data flow control, conducting 24/7 on-call shifts, and facilitating collaborations with other CERN facilities, ensuring swift resolution to issues impacting data collection.
- From 2019, took the helm in orchestrating data acquisition planning and execution from Transition Radiation (TR) studies using a prototype grounded on the Timepix3 detector with Katherine readout, ensuring meticulous data capture and analysis. Innovated and developed the Fast Analysis Toolkit, which included a reliable GUI application with a user-friendly interface. This toolkit provided containerisation and orchestration of ROOT algorithms using Docker, guaranteeing a seamless data flow and enabling shifters to effectively evaluate Timepix3 detector's data quality during test beam sessions.

CERN, ATLAS **November 2015 – November 2016**

Qualification Work for the ATLAS TRT *Genève, Switzerland*

- Played a key role in revitalising the TRT TDAQ testbench and ensuring its functionality as a vital simulation environment for testing solutions pre-implementation in the experimental cavern.
- Orchestrated the migration of TRT TDAQ software and spearheaded pivotal transitions: navigated from the CMT build system to CMake and shifted version control from SVN to Git, while also managing the migration from a 32-bit to a 64-bit OS. All transitions were executed ensuring minimised disruptions and maintaining smooth workflow adaptations in TRT activities.
- Engaged deeply in TRT detector operations, including operational activities, software development, and TRT TDAQ on-call shifts at CERN.
- Actively participated in commissioning the TRT at the inception of Run 2, contributing to software development and operational continuity.
- Engaged in pivotal studies, analysing Xe and Ar mixtures at high occupancies, which significantly impacted the TRT detector.
- Developed and validated a calibration procedure for the Argon mixture, enhancing the TRT dE/dx tool and its integration into the 21st release of ATLAS Software (Athena).

SAFEDATA LLC **July 2013 – April 2015**

Senior Engineer *Moscow, Russia*

- Adhered to a rigorous 24/48 work schedule to persistently monitor power and cooling systems, ensuring the consistent operation of the data center and facilitating a rapid response to errors or emergencies.
- Key player in rapid response efforts during system errors and emergencies, deploying effective troubleshooting and mitigation strategies to restore functionality and service in minimal time.
- Executed preventative maintenance protocols and swiftly responded to system alerts and outages, minimising downtime and ensuring operational continuity.
- Maintained a comprehensive database of equipment within the data center, ensuring all items were accurately registered and tracked. Conducted regular audits to verify database integrity and accuracy.
- Diligently processed and fulfilled customer orders, ensuring accuracy and timeliness in all transactions.
- Maintained clear and concise communication channels with customers, providing updates on order status and managing expectations regarding potential delays.

Education

Radboud University **2017 – current**

Ph.D. *student* *Nijmegen, Netherlands*

Thesis subject: *'Drell-Yan angular distributions measurement in W boson decays at $\sqrt{s} = 13$ TeV with low-mu data"*

Supervisor: *Prof. Nicolo de Groot and Prof. Anatoli Romaniouk*

NRNU MEPhI **2015 – 2022**

Doctoral *student* *Moscow, Russia*

Research subject: *"Search for heavy long-lived multi-charged particles at $\sqrt{s} = 13$ TeV using the ATLAS detector"*

Supervisor: *Prof. Anatoli Romaniouk*

- 2017 – 2022 Enrolled in a Joint Ph.D. Program between NRNU MEPhI and Radboud University

NRNU MEPhI **2013 – 2015**

M.Sc. *in Particle Physics* *Moscow, Russia*

Thesis subject: *"π^0-charged hadron correlations in p-Pb and Pb-Pb collisions at the ALICE experiment"*

Supervisor: *Prof. Vladislav Manko and Dr. Dmitry Blau*

NRNU MEPhI **2009 – 2013**

B.Sc. *in Particle Physics* *Moscow, Russia*

Thesis subject: *"Simulation of electromagnetic shower using GEANT4 in calorimeter at the ALICE experiment"*

Supervisor: *Prof. Vladislav Manko*

Awards

ATLAS Outstanding Achievement Award 2020 — **January 2021**
ATLAS CERN — *Genève, Switzerland*
"For outstanding contributions to the DAQ upgrades directed to the TRT operation at high occupancy and trigger rate"

Schools and workshops

BND'18 — **September 2018**
The Belgian Dutch German graduate school in particle physics 2018 — *Berlin, Germany*

BND'17 — **September 2017**
The Belgian Dutch German graduate school in particle physics 2017 — *Callantsoog, Netherlands*

ISOTDAQ'17 — **Jan-Feb 2017**
International School of Trigger and Data AcQuisition 2017 — *Amsterdam, Netherlands*

ISSP'15 — **Jun-Jul 2015**
International School of Subnuclear Physics 2015 — *Erice, Italy*

Summer School Programme at CERN 2014 — **Jun-Aug 2014**
Genève, Switzerland

NEC'2013 — **September 2013**
XXIV *International Symposium on Nuclear Electronics and Computing* — *Varna, Bulgaria*

AIS&GRID'13 — **April 2013**
A School on JINR/CERN GRID and advanced information systems — *Dubna, Russia*

Technical Skills

Languages: C/C++, Python, SQL, Tcl, HTML/CSS
Developer Tools: JetBrains, CMake, Valgrind/GDB, CPPcheck, Coverity, Docker, GitLab CI, JIRA, Doxygen
Technologies/Frameworks: Linux, Grafana, Prometheus, NumPy/Pandas, Spark, HTCondor, Openshift, Django, Oracle DB, ATLAS TDAQ SW, ROOT, uproot, Matplotlib, Athena, Geant4

Languages

- Russian: Mothertongue
- English: Advanced
- French: Basic Knowledge

Selected Publications

- "A concept of the transition radiation detector for a hadron separation in a forward direction of the LHC experiments", Journal of Physics: Conference Series, vol. 1690, (2020), pp:012043
- "Registration of the transition radiation with GaAs detector: Data/MC comparison", Journal of Physics: Conference Series, vol. 1690, (2020), pp:012041
- "Transition radiation measurements with a Si and a GaAs pixel sensor on a Timepix3 chip", Nuclear Inst. and Methods in Physics Research, A 958 (2020) 162037
- "First measurements of the spectral and angular distribution of transition radiation using a silicon pixel sensor on a Timepix3 chip", Nuclear Inst. and Methods in Physics Research, A 927 (2019) 1–13
- "Search for heavy long-lived multi-charged particles in proton-proton collisions at $\sqrt{s} = 13$ TeV using the ATLAS detector", Phys. Rev. D 99 (2019) 052003
- "Test beam studies of possibilities to separate particles with gamma factors above 10^3 with straw based Transition Radiation Detector", J.Phys.Conf.Ser. 934 (2017) no.1, 012053
- "Measurements of angular distribution and spectrum of transition radiation with a GridPix detector", J.Phys.Conf.Ser. 934 (2017) no.1, 012049