Ilija Vukotic

1606 E 50thPl. Apt.7E• Chicago, Il 60615
Phone: +1 872 230 6435 • E-Mail: ivukotic@uchicago.edu

IV

Education

2005	**Ph.D.,** Department of High Energy Physics, Humboldt University, Berlin, Germany Thesis: *Measurement of J/ψ and $\psi(2S)$ Production in Proton-Nucleus Interactions using the HERA-B Experiment*
1999	**M.Sc.,** Faculty of Physics, University of Belgrade, Belgrade, Serbia Thesis: *Development and Application of the Genetic Algorithms in Describing Binding Energy of Nuclei*
1998	**B.Sc.,** Applied Physics and Informatics, Faculty of Physics, University of Belgrade, Serbia

Employment

April 2015 - …	**University of Chicago,** Chicago, USA – Computational Scientist. The main person behind ATLAS federated storage system – systems integration software, monitoring, computing centers and user support, setting up a network of data caching servers. Heading the ATLAS data analytics efforts: provisioning of the hardware, software stack, organizing the data collection and mining services, providing user education and support. I use the framework to analyze system-wide performance, report and act on the insights. Some of the topics are: WLCG network – performance understanding and optimization, prediction and delivery of the future performance data; Grid job processing – improving algorithms used for job brokering, data distribution management, access methods and protocols. Monitoring experimental data usage patterns and characterizing performance of the physics analysis frameworks. This informs decisions on the data content, formats, and distribution. Instigator and principal developer behind ATLASrift, an interactive, immersive, virtual reality ATLAS event viewer and outreach tool. Investigating possibilities for using neurocognitive computing in ATLAS event selection and reconstruction.
March 2012 – April 2015	**University of Chicago,** Chicago, USA – staff position. Working on all aspects of the federated data access system (FAX) for ATLAS experiment. Duties include: core software development - plugins for name mapping, redirection, and monitoring; establishing monitoring systems – tests, results collection, visualization; integration with other ATLAS systems – SSB, AGIS, PanDA, deployment support – being main point of contact for campaigns covering 65 ATLAS computing sites; documentation (JIRA, TWiki) and organization, providing user support, etc. Related projects include: work on optimization of xAOD data format, engineering a system to collect and mine xAOD usage data inside a more general data mining framework, being liaison with ROOT team, evaluation of how suitable are commercial cloud services in ATLAS context, etc.

Dec 2008 – Mar. 2012	**Linear Accelerator Laboratory**, Paris, France – (*Contract Duration* Determinée). Conceived, organized and executed full system of monitoring all of the official ATLAS production jobs. All of the performance data from more than 200 thousands jobs per day are collected and summarized in Oracle databases. Planed and executed a system for monitoring and optimization of IO performance of HammerCloud jobs. Investigations on possible usage of GP GPU computing methods inside and outside of ATLAS context.
2006 – Dec.2008	**Linear Accelerator Laboratory**, Paris, France – PostDoc position. Software performance optimization and data analysis for the ATLAS experiment, CERN, Geneva. Since this experiment produced data at 60 TB/day rate, software optimization is essential despite having some of the largest computer farms in the world. CPU time, memory and disk space, were squeezed to the limit. Frequently delivering order of magnitude improvements on all three by means of code optimization, algorithm improvements and advance knowledge based compression. This is all done in C++ with python based interface and is GRID enabled. I have performed the full chain of Higgs search data analysis starting from Monte Carlo generation, signal extraction and cuts optimization to systematic effect estimation.
2006	**Public institution Center for Eco-toxicological Research** (JU CETI) – permanent position. Designed and implemented of computer network, data acquisition and document flow.
2005	**Midland Ltd.** steel plant, Niksic, Montenegro – permanent position. Designed, organized work and implemented automatization of process control systems, access control system, video surveillance and safety system, phone and network systems, databases and financial software.

Publications

Anomaly detection in wide area network mesh using two machine learning anomaly detection algorithms
Future Generation Computer Systems, Volume 93, April 2019, Pages 418-426

ATLAS Analytics and Machine Learning Platforms
http://cds.cern.ch/record/2627020 (2018)

Getting the Most from Distributed Resources: An Analytics Platform for ATLAS Computing Services.
192. 10.22323/1.282.0192. (2017)

Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC
Phys.Lett. B716 (2012) 1-29 doi:10.1016/j.physletb.2012.08.020

Expected Performance of the ATLAS Experiment - Detector, Trigger and Physics
http://arxiv.org/pdf/0901.0512v4 (2008)

Angular Distributions of Leptons from J/Psi's Produced in 920 GeV Fixed-Target Proton-Nucleus Collisions
*Eur.Phys.J.C*60 (2009), 517-524 doi:10.1140/epjc/s10052-009-0957-7

Production of the Charmonium States chic_1 and chic_2 in Proton Nucleus Interactions $\sqrt{s}$ = 41.6 GeV
Phys. Rev. D79, 012001 (2009), Issue 1

V^0 Production in p+A Collisions at $\sqrt{s}$ = 41.6 GeV
*Eur.Phys.J.C*61 (2008), 207-221 doi:10.1140/epjc/s10052-009-1005-3

The Outer Tracker Detector of the HERA-B Experiment part III: Operation and Performance
Nucl. Instr. and Meth. A 576 (2007) 312-330

Kinematic Distributions and Nuclear Effects of J/psi Production in 920 GeV Fixed-Target Proton-Nucleus Collisions
*Eur.Phys.J.C*60 (2007), 525-542 doi:10.1140/epjc/s10052-009-0965-7

A Measurement of the Psi' to J/psi Production Ratio in 920 GeV Proton-Nucleus Interactions
*Eur.Phys.J.C*49 (2007) 545-558 doi:10.1140/epjc/s10052-006-0139-9

Luminosity determination at HERA-B
*Nucl.Instrum.Meth.*A582 (2007), 401-412

Measurement of D^0, D^+, D_s^+ and D^{*+} Production in Fixed Target 920 GeV Proton-Nucleus Collisions
*Eur.Phys.J.C*52 (2007), 531-542

Measurement of the J/ψ Production Cross Section in 920 GeV/c Fixed-Target Proton-Nucleus Interactions
Phys. Lett. B638 (2006), 407-414 doi:10.1016/j.physletb.2006.03.064

Measurement of the Υ Production Cross Section in 920 GeV/c Fixed-Target Proton-Nucleus Collisions
Phys. Lett. B 638 (2006), 1,13-21 doi:10.1016/j.physletb.2006.04.042

Polarization of Λ and Λbar in 920 GeV/c Fixed-Target Proton-Nucleus Collisions
*Phys. Lett. B*638 (2006), 415-421

The HERA-B Outer Tracker Detector Part I: Detector
Nucl. Instr. and Meth. A 555 (2005) 310

Improved measurement of the B-BBAR Production Cross Section in 920 GeV/c Fixed-Target Proton-Nucleus collisions
Phys. Rev. D vol.73, 052005, issue 5 (2005)

The Outer Tracker Detector of the HERA-B Experiment part II: Front-End Electronics
Nucl. Instr. and Meth. A 541 (2005) 610

How should we Fit the Differential Cross Section of J/ψ Production
HERA-B Note 04-027, (2004)

Limits for the central production of Θ^+ and Ξ^{--} pentaquarks in 920 GeV pA collisions
Phys. Rev. Lett. 93, 212003 1-6 (2004)

Search for the flavor-changing neutral current decay $D^0 \rightarrow \mu^+\mu^-$ with the HERA-B detector
Phys. Lett. B 596, 173 (2004)

Measurement of the BBbar production cross section in 920 GeV fixed-target proton nucleus collisions
Eur. Phys. J. C 26, 345 (2003)

J/ψ production via χ_c decays in 920 GeV pA interactions,
Phys. Lett. B 561, 61 (2003)

Aging studies for the large honeycomb drift tube system of the outer tracker of HERA-B
Nucl. Instrum. Meth. A 515, 155 (2003)

Inclusive V^0 production cross sections from 920 GeV fixed target proton-nucleus collisions
Eur. Phys. J. C 29, 181 (2003)

Conference contributions

DPF 2015, Ann Arbor, US
ATLASrift - a Virtual Reality application
http://arxiv.org/abs/1511.00047

NEC 2015, Becici, Montenegro
Data analytics in ATLAS experiment

CHEP 2013, Amsterdam, Netherlands
Data Federation Strategies for ATLAS Using XRootD
J. Phys.: Conf. Ser. 1742-6596 **513** 042049 doi:10.1088/1742-6596/513/4/042049

CHEP 2012, New York, USA.
Using Xrootd to Federate Regional Storage,
Monitoring of computing resource utilization of the ATLAS experiment,
The ATLAS ROOT-based data formats: recent improvements and performance measurements,
J. Phys.: Conf. Ser. **396** 032112 doi:10.1088/1742-6596/396/3/032112

Future computing in particle physics 2011, e-Science Institute, Edinburgh, UK
Atlas IO improvements and Future prospects,
GP using GPGPU - my experience with OpenCL

CHEP 2010, Taipei, Taiwan.
Optimization and Performance Measurements of ROOT-based Data Formats in the ATLAS Experiment
J. Phys.: Conf. Ser. **331** 032032 doi:10.1088/1742-6596/331/3/032032

Quark Confinement and the Hadron Spectrum VI, Tanka Village, Sardinia, 21-25. September 2004.
Open and Hidden Charm Production in 920 GeV Proton-Nucleus Collisions at HERA-B
Proceedings published by American Institute of Physics.

References

Dr. Robert W Gardner, Senior Research Associate, University of Chicago
Searle Chemistry Laboratory, Room: 201, 5735 South Ellis Avenue, Chicago, IL 60637
rwg@uchicago.edu, +1 312-804-0859

Dr. Shawn McKee, Research Scientist, Brookhaven National Laboratory,
Physics Department, University of Michigan, Ann Arbor, MI 48109-1040
smckee@umich.edu, +1 734-255-8293

Dr. Ernst Michael, Director RACF, Brookhaven National Laboratory,
RACF Computing Facility, Bldg. 510M, Office: M2-25, Brookhaven National Laboratory, Upton, NY 11973-5000
mernst@bnl.gov, +1 631-344-4223