

Dr. Suren A. Chilingaryan

Scientific Systems Architect | Distributed & Heterogeneous Systems

@ csa@suren.me 📞 +49 (176) 438-53094 🔗 <http://suren.me> 🎓 Scholar 📄 OrcID in linkedin

20 years of experience designing and delivering distributed, data-intensive systems for large-scale scientific instrumentation. Architected systems spanning hardware interfaces, low-latency data paths, heterogeneous computing, data management, and cloud-native orchestration, combining architectural breadth with deep systems and performance expertise. Lead multidisciplinary development, bridge scientific experiments with HPC centres, and take research prototypes into long-lived production systems.

KEY COMPETENCES

Leadership	Team building, cross-team coordination, presentations & publications
Project Management	Technical & financial planning, proposals & funding, partnerships
Architecture	Distributed & heterogeneous systems, data-intensive scientific systems, high-bandwidth DAQ, data-driven control, data organization & lifecycle
Performance	Parallel & approximate algorithms, performance modeling, code optimization
Platforms	Kubernetes/OpenShift, distributed storage, SQL/TSDB/array databases
Key Technologies	C/C++, Linux/POSIX/IPC, CUDA/OpenCL, NUMA, PCIe/DMA, RDMA

SELECTED PROJECTS

Since 2026	Distributed Data Architecture for Interactive 3D/4D Tomography Repositories ➤ Co-authored proposal; PI / work-package lead for data reduction and organization ➤ Project targets a data lifecycle spanning data-generation facilities, HPC centres & users ➤ Exploring compression, caching, and abstractions to enable interactive data access ➤ Co-designing DAG tomography framework; evaluating NVIDIA Graphs/Holoscan
Since 2018	KATRIN-as-a-Service (KaaS) platform for distributed data acquisition systems ➤ Initiated platform, secured funding, built team of 4, and led production rollout ➤ Coordinated integration across Canonical, KIT HPC, electronics & experiment teams ➤ KaaS integrates data from fast detectors and thousands of monitoring sensors ➤ Led development of containerized AF_XDP data-acquisition framework ➤ Cut costs by adapting legacy software for distributed ops and integrating HPC resources
2017 – 2022	Uncovering & Exploiting GPU Architectural Features ➤ Identified performance imbalances and hidden parallelism in NVIDIA and AMD GPUs ➤ Developed method exploiting intra-SM parallelism on NVIDIA (up to 30% speed-up) ➤ Accelerated tomography 4–6× through architecture-aware resource balancing ➤ Published paper "Reviewing GPU architectures to build efficient back projection..."
2016 – 2017	GPU-based L1 Trigger for CERN CMS using GPUDirect (6 μs latency budget)
2011 – 2017	Coordinated software work-package and led algorithm parallelization in a project "Ultrafast tomography with online monitoring and image-based control"

EMPLOYMENT

Since 2020	Scientific Systems Architect at KIT: End-to-end systems for data-intensive instrumentation, from detectors to processing & data organization
2013 – 2020	Data Processing and Performance Engineer at KIT: high-performance instrumentation for large-scale scientific experiments
2007 – 2012	Postdoctoral Researcher at KIT: data management & software optimization
2001 – 2007	Software Engineer & Researcher at Yerevan Physics Institute and Forschungszentrum Karlsruhe: DAQ middleware and control systems

EDUCATION

July 2006	PhD in Computer Engineering “Data Exchange Solution for Distributed Data Acquisition Systems and its application for Cosmic Ray Monitor Networks”, National Academy of Science, Armenia
1996 – 2001	MSc in Mathematics “Data Processing using Neural Networks”, Moscow State University, Russia

PROJECTS

2012 – 2017	Remote-DMA based Data Acquisition Platform ➤ Developed a driver platform for fast prototyping of PCIe-based electronics with a modular (user-space) DMA engine (up to 12 GB/s) and scripting/debugging support ➤ Implemented drivers for in-house electronics, e.g. camera (<i>in use at KIT and Desy</i>) ➤ Used RDMA and GPUDirect/DirectGMA to intercommunicate detectors with GPUs ➤ Led a case study on applications of GPUs for CMS track trigger, decision on acceptance of a track candidate was made within 6 μs (data transfer + analysis) ➤ GPUs allowed to utilize a more precise algorithm than was possible with classic designs
2010 – 2017	Coordinated student exchange program with Tomsk Polytechnic University
2015 – 2016	Cloud platform for collaborative analysis of tomographic data ➤ Led development of web-visualization for large and time-resolved volumes
2011 – 2015	UFO: Ultrafast tomography with online monitoring and image-based control ➤ Proposed a scalable architecture for pipelined processing of image streams ➤ Coordinated software development with a team in KIT and 3 Russian universities ➤ Supervised development of fast reconstruction algorithms (up to 6 GB/s per node) ➤ Supervised development of regularized reconstruction methods to compensate low SNR and/or undersampling in case of high-speed tomography ➤ Since 2016, the developed system is installed at the KIT synchrotron and enables both high-speed (5 volumes/second) and high-throughput (1000 samples/week) operation
2011 – 2014	ADEI: Advanced Data Extraction Infrastructure ➤ Helped to secure funding and initiated collaboration between KIT and YerPhI ➤ Supervised a cross-university team of researchers and engineers ➤ Developed a platform for exploration and analysis of time-series in terascale archives ➤ System is in operation in YerPhI, the SEVAN network, and 7 major facilities at KIT
2009 – 2013	Parallel algorithms and software optimization, 10-100x speed-up ➤ Developed parallel algorithms for μPIV (micro-particle velocimetry) ➤ Leveraged the PowerXCell architecture for a MRSES feature selection algorithm ➤ Optimized performance of PyHST (ESRF tomographic framework) ➤ Implemented a digital image correlation and tracking algorithm for GPUs
2002 – 2008	Distributed systems for data acquisition and slow control ➤ Stabilized a slow control system of the KATRIN experiment (<i>in use</i>) ➤ Built a distributed data acquisition system for ASEC particle detector network (<i>in use</i>) ➤ Developed Linux drivers and control software for AI-accelerator

TECHNICAL BACKGROUND

Programming	C/C++, POSIX/IPC, OpenMP/NPTL, NUMA, SIMD, CUDA/OpenCL
System Program.	Linux & Kernel Internals, PCIe Drivers, DMA/GPUDirect/DirectGMA
Networking	Ethernet/InfiniBand, EPICS, Sockets/MPI/0MQ, RDMA (RoCE), LibVMA
Software Analysis	gdb, perf/operf, nvvp/nvprof, vtune, valgrind, systap, tcpdump
Data Management	Brokers, Databases (SQL/TSDB/Array/InMem), XML, Web Development
Orchestration	Ansible, Kubernetes/OpenShift, OCI/Docker, LibVirt/KVM, Ceph/GlusterFS

EXPERIMENTS AND COLLABORATIONS

Current

Since 2020	PANDA: antiProton ANnihilation in Darmstadt, Germany (<i>Member</i>)
Since 2008	KARA: Karlsruhe Research Accelerator, <i>KIT</i> , Germany
Since 2007	KATRIN: Karlsruhe Tritium Neutrino Experiment, Germany (<i>Member</i>)
Since 2006	SEVAN: Space Environment Viewing and Analysis Network; coordinated by <i>YerPhI</i>
Since 2001	ASEC: Aragats Space Environmental Center, Armenia (<i>Member</i>)

Past

2013 – 2025	BESS: Battery Technology Center at <i>KIT</i> , Germany
2020 – 2021	CCPi: Collaborative Computational Project for Imaging; led by UoM and STFC
2014 – 2018	HZG: Helmholtz-Zentrum Geesthacht, Germany
2010 – 2018	TPU: Tomsk Polytechnic University, Russia
2016 – 2017	CMS: Compact Muon Solenoid, <i>CERN</i>
2016 – 2017	UFO: German-Russian Collaboration on Ultrafast Tomography
2010 – 2017	SCI: Shubnikov Crystallography Institute, Russia
2009 – 2015	KIT Cube: Integrated atmospheric observation system (operated by <i>KIT</i>)
2009 – 2015	KIT Tower: Meteorological tower at <i>KIT</i> North Campus, Germany
2008 – 2014	TOSKA: Test facility for fusion magnets at <i>KIT</i> , Germany
2008 – 2014	ESRF: European Synchrotron Radiation Facility, France

FUNDING

2025	(PI) responsible for WP for data reduction and organization in project on smart repositories for digitized morphology ERUM Data 05D25CK1 (430 k€) MorphoSphere (2026 – 2029)
2023	(Coordinator) investments to comission development of new KATRIN Kubernetes platform KATRIN (195 k€) KaaS/platform (2025)
2022	(Associate Partner) Smart Modules for AI-supported Serial X-Ray Micro Computed Tomography for Comparative Morphological Studies at PETRA III/IV BMBF 05K22VKA (1.2 m€) SMART-Morph (2022 – 2025)
2021	(Coordinator) investments for upgrade of KaaS cluster KATRIN (250 k€) KaaS/hardware (2021)
2013, 2016	(Technical contribution) projects on collaborative analysis of tomographic datasets BMBF 05K2013 & 05K2016 (750 k€) ASTOR (2013 – 2016) NOVA (2016 – 2020)
2012	(Contributing author) networking grant for cooperation with ASEC BMBF WTZ_ARM_2012-016 (15 k€) ADEI (2013 – 2015)
2011	(Contributing author) <i>Vaporciyan Multivariate Analysis and Visualization</i> (non-governmental grant by Armenian diaspora) Diaspora (100 k\$) VMAV (2012 – 2014)
2010, 2011	(Contributing author) <i>Ultra Fast X-ray Imaging of Scientific Processes with On-line Assessment and Data-driven Process Control</i> BMBF 05K10CKB & 05K10VKE (2.5 m€) UFO-1 (2010 – 2013) UFO-2 (2012 – 2015)
2009	(Technical contribution) to HDRI (<i>High Data Rate Processing and Analysis</i>) initiative in Helmholtz PNI (<i>Photons, Neutrons, Ions</i>) research program Helmholtz HDRI (2010 – 2014)

LEADERSHIP

2020 – 2025	Leading efforts to prepare the <i>KATRIN</i> data infrastructure for the <i>Tristan</i> detector Group: 2 engineers PhD 2 students
2018 – 2020	Led development of the <i>KATRIN</i> cloud platform and migration of services Group: 2 Postdocs PhD 2 students
2013 – 2018	Led volume visualization task force in the <i>ASTOR</i> and <i>NOVA</i> projects Group: PhD 5 students
2010 – 2018	Coordinated a program on stewardship of theses for <i>TPU</i> students Participation: 3 PhD 12 students
2010 – 2016	Led a collaboration with <i>ASEC</i> on online data analysis platform Group: Postdoc and PhD in <i>KIT</i> Postdoc and 2 engineers at <i>ASEC</i> 10 students
2010 – 2017	Coordinated a work-package on tomographic software in the <i>UFO</i> project Group: 3 PhD in <i>KIT</i> 3 PhD in partner universities 5 students

RESPONSIBILITIES

Current

Since 2025	Data reduction and data organization work-package for Morphosphere project at <i>KARA</i>
Since 2024	Coordinating commission to design and deploy of Kubernetes platform at <i>KATRIN</i>
Since 2018	Data management cloud at <i>KATRIN</i>
Since 2011	Software stack of <i>UFO</i> data acquisition platform
Since 2007	Slow control system at <i>KATRIN</i>

Past

2023 – 2025	Coordinating development ethernet-based DAQ systems
2013 – 2025	Data management system for <i>KIT Battery Technology Center</i>
2017 – 2018	Transfer of <i>UFO</i> Camera technology to <i>HZG</i>
2010 – 2017	Parallel computing cluster for <i>UFO</i> project
2013 – 2016	Technology transfer to <i>ASEC</i> and <i>SEVAN</i> experiments
2009 – 2015	Data portal for <i>KIT Cube</i> experiment and <i>KIT Weather Tower</i>
2008 – 2014	Maintenance and optimization of <i>KARA</i> branch of <i>PyHST</i>
2008 – 2014	Data management system at <i>TOSKA</i> and <i>CULTKA</i> facilities
2007 – 2009	Integration of <i>KATRIN</i> components in centralized control system
2005 – 2007	Data acquisition and data management at <i>ASEC</i> and <i>SEVAN</i>
2003 – 2005	Intercommunication between <i>KATRIN</i> DAQ and NI fieldpoint devices
2001 – 2002	IT infrastructure of <i>ASEC</i>

SCIENTIFIC AND OPEN-SOURCE SOFTWARE

Maintain

Since 2018	KaaS: Katrin-as-a-Service data management platform for <i>KATRIN</i> ands.suren.me KATRIN
Since 2011	Alps: Linux driver platform for fast prototyping of PCIe-based electronics alps.suren.me Camera at HZG Camera at SCI Kapture/Kalypso at <i>KARA</i>
Since 2008	ADEI: cloud platform for visualization and analysis of time-series adei.info KATRIN KARA ASEC BESS KIT Tower KIT Cube TOSKA
Since 2005	ADAS: data acquisition system for <i>ASEC</i> detectors adas.suren.me ASEC
Since 2003	RusXMMS: operations with multilingual strings in non-unicode encodings rusxmms.sf.net RedHat OpenSuSE Debian Ubuntu Arch FreeBSD

Supervised and coordinated

2023 – 2025	DQDK: framework for Ethernet-based data acquisition github.com/kit-ipe/dqdk KATRIN
2015 – 2025	Bora: monitoring framework for ADEI ecosystem bora.suren.me KATRIN
2021 – 2024	SciTS: benchmark for time-series databases to improve organization of slow control data in KATRIN experiment github.com/kit-ipe/timeds KATRIN
2015 – 2018	WAVE: JavaScript volume rendering library based on WebGL wave.suren.me
2012 – 2017	UFO: image-processing framework and a collection of GPU-accelerated algorithms ufo-kit.github.io KARA

Contributions

2020 – 2021	CCPi: Tomographic Imaging Project (<i>performance optimizations</i>) www.ccpi.ac.uk
2008 – 2014	PyHST: ESRF tomography software (<i>DFI algorithm and performance improvements</i>) pyhst2.suren.me KARA ESRF

Obsolete

2010 – 2011	MRSES: feature selection algorithm for Intel and PowerXCell architectures
2009 – 2010	DictHW: CUDA implementation of digital image tracking algorithm
2003 – 2009	XMLBench: XML Benchmarking suite

RESEARCH AND DEVELOPMENT

While the focus of my research is computing technologies, the developed instrumentation enabled major scientific break-throughs achieved by the KATRIN [9] and ASEC [24] collaborations. Below are referenced selected peer-reviewed publications which are either authored by me and my students or where we made a significant contribution.

Since 2011	High-bandwidth data acquisition and data-driven control
Since 2026	Research on data reduction and data organization for distributed smart repositories KARA
Since 2020	Development of ethernet-based DAQ systems leveraging existing high-performance and cloud computing infrastructure [1]–[4] DQDK SciTS Bora
2018 – 2019	Fine-tuning of tomographic reconstruction algorithms through micro-benchmarking and performance modeling [7] UFO PyHST
2016 – 2017	Participated in a case study on applications of GPUs in the Level-1 track trigger for the next upgrade of the CMS experiment [13] CMS
2016 – 2017	Designed a platform for synchrotron imaging beamlines with a possibility of online reconstruction and an image-based feedback loop [12], [20] UFO
2015 – 2016	Researched low-latency communication mechanisms for data-driven control applications [15] Alps
2014 – 2015	Implemented fast DMA drivers with GPUDirect / DirectGMA support [17] Alps
2013 – 2014	Reviewed asymptotically fast methods of tomographic reconstruction well-fitted for GPU architectures [19] UFO PyHST
2011 – 2013	Researched software architectures for online processing of image streams [22] UFO
2011 – 2013	Developed a streaming data acquisition platform for scientific cameras [21] Alps

Since 2007	Parallel architectures, performance analysis, and software optimization
2020 – 2021	Applied methods of approximate computing to enable reconstruction of large datasets using memory-intensive regularization methods [6] CCPi
2017 – 2018	Researched performance imbalances and a hidden parallelism in GPU architectures and how they can be exploited to speed-up tomographic reconstruction [11] PyHST
2014 – 2017	Investigated viable compromises between reconstruction quality and parallelization capabilities of tomographic algorithms [18] UFO
2013 – 2014	Developed parallel algorithms for μ PIV (micro-particle velocimetry) [10] UFO
2010	Leveraged the PowerXCell architecture for an MRSES feature selection algorithm (5000x speed-up compared to a MATLAB prototype) MRSES
2009 – 2010	Optimized the PyHST tomographic reconstruction framework [23] PyHST
2009 – 2010	Implemented a digital image correlation and tracking algorithm for GPUs DictHW
2007 – 2008	Carried out a performance study of open-source XML frameworks [26] XMLBench
Since 1999	Digitization, data organization, and distributed control systems
Since 2019	Researching cloud technologies for highly heterogeneous control systems in large-scale scientific experiments [5] KaaS
2015 – 2017	Researched remote visualization techniques for large and time-resolved tomographic volumes [8], [14] WAVE
2013 – 2015	Researched emerging web technologies for management and visualization of terabyte-scale archives with time-series ADEI
2011 – 2014	Converted the KATRIN data management system into a full flagged platform for time-series exploration and analysis ADEI
2008 – 2010	Developed data management modules of the KATRIN control system [25] ADEI
2007 – 2008	Stabilized the KATRIN slow control system for production use [16] KATRIN
2005 – 2006	Developed a data acquisition system for particle detector networks [27] ADAS
2002 – 2004	Researched network protocols for heterogeneous slow control systems [28] ADAS
1999 – 2001	Evaluated hardware-accelerated neural networks for trigger applications [29]

SUPERVISION AND TEACHING

Supervised PhD students

2020 – 2025 thesis “Virtualized Low Latency Data Acquisition”

Co-supervised PhD students

2014 – 2018 thesis “Big Data Management and Visualisation”

2013 – 2017 work on collaborative tools for analysis of microtomography data

2013 – 2017 work on low-latency communication protocols for distributed data acquisition systems

2011 – 2016 thesis “An Extensible Parallel Computing Framework for Ultra-Fast X-Ray Imaging”

Supervised MSc and BSc students

2021 – 2021 MSc theses “Fast tomographic reconstruction using parallel and approximate computing”

2021 – 2021 3 MSc theses on database and cloud technologies for slow-control systems of large-scale experiments

2014 – 2018 5 MSc theses on remote visualization of archives with tomographic data

2013 – 2017 4 students working on fast DMA interconnects between FPGA and GPUs

2011 – 2016	4 MSc and 2 BSc theses on advanced algorithms in tomographic reconstruction
2010 – 2015	10 internships on web technologies for visualization of time series
2014	2 MSc theses on GPU-accelerated algorithms for nano-particle tracking

Courses and seminars

2019	GPU computing tutorial at ARBRA summer school in Nor-Amberd, Armenia
2014 – 2017	4 student projects at seminar “Advanced topics in Parallel Programming”
2013	GPU computing tutorial at KSETA graduate school at KIT

SELECTED PUBLICATIONS

- [1] J. Mostafa *et al.*, “100-gbit/s udp data acquisition on linux using af_xdp: The tristan detector,” *IEEE Transactions on Nuclear Science*, vol. 72, no. 3, pp. 295–300, 2025. DOI: 10.1109/TNS.2024.3452469.
- [2] N. Tan Jerome *et al.*, “Bora: A personalized data display for large-scale experiments,” *IEEE Transactions on Nuclear Science*, vol. 72, no. 3, pp. 498–505, 2025. DOI: 10.1109/TNS.2024.3471071.
- [3] J. Mostafa *et al.*, “Are kernel drivers ready for accelerated packet processing using af_xdp?” In *2023 IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN)*, 2023, pp. 117–122. DOI: 10.1109/NFV-SDN59219.2023.10329590.
- [4] J. Mostafa *et al.*, “Scits: A benchmark for time-series databases in scientific experiments and industrial internet of things,” in *Proceedings of the 34th International Conference on Scientific and Statistical Database Management*, ser. SSDBM '22, Copenhagen, Denmark: Association for Computing Machinery, 2022, ISBN: 9781450396677. DOI: 10.1145/3538712.3538723. [Online]. Available: <https://doi.org/10.1145/3538712.3538723>.
- [5] M. Aker *et al.*, “The design, construction, and commissioning of the katrin experiment,” *Journal of Instrumentation*, vol. 16, T08015, 2021. DOI: 10.1088/1748-0221/16/08/T08015.
- [6] E. Ametova *et al.*, *Crystalline phase discriminating neutron tomography using advanced reconstruction methods (preprint)*, 2021. arXiv: 2102.06706.
- [7] S. Chilingaryan *et al.*, “Reviewing GPU architectures to build efficient back projection for parallel geometries,” *Journal of Real-Time Image Processing*, vol. 17, pp. 1331–1373, 5 Oct. 2020. DOI: 10.1007/s11554-019-00883-w.
- [8] P. D. Lösel *et al.*, “Introducing Biomedisa as an open-source online platform for biomedical image segmentation,” *Nature Communications*, vol. 11, no. 1, p. 5577, Nov. 2020. DOI: 10.1038/s41467-020-19303-w.
- [9] M. Aker *et al.*, “Improved upper limit on the neutrino mass from a direct kinematic method by KATRIN,” *Phys. Rev. Lett.*, vol. 123, p. 221802, 22 Nov. 2019. DOI: 10.1103/PhysRevLett.123.221802.
- [10] P. Cavadini *et al.*, “Investigation of the flow structure in thin polymer films using 3D μ PTV enhanced by GPU,” *Experiments in Fluids*, vol. 59, no. 4, pp. 1–13, Mar. 2018. DOI: 10.1007/s00348-017-2482-z.
- [11] S. Chilingaryan *et al.*, “Balancing load of GPU subsystems to accelerate image reconstruction in parallel beam tomography,” in *Proceedings of the 30th International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD)*, 2018. DOI: 10.1109/CAHPC.2018.8645862.
- [12] A. Kopmann *et al.*, “UFO - a scalable platform for high-speed synchrotron X-ray imaging,” in *Proceedings of the 2016 IEEE NSS/MIC*, 2017. DOI: 10.1109/NSSMIC.2016.8069895.
- [13] H. Mohr *et al.*, “Evaluation of GPUs as a level-1 track trigger for the High-Luminosity LHC,” *Journal of Instrumentation*, vol. 12, no. 04, p. C04019, 2017. DOI: 10.1088/1748-0221/12/04/C04019.
- [14] N. Tan Jerome *et al.*, “WAVE: A 3D online previewing framework for big data archives,” in *Proceedings of the Intl. Conf. on Computer Vision, Imaging, and Computer Graphics Theory and Applications (IVAPP)*, vol. 3, 2017, pp. 152–163.
- [15] M. Vogelgesang *et al.*, “High-throughput data acquisition and processing for real-time x-ray imaging,” in *Proc. SPIE*, vol. 9967, 2016, pp. 996715–996715-9. DOI: 10.1117/12.2237611.
- [16] J. Amsbaugh *et al.*, “Focal-plane detector system for the katrin experiment,” *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 778, pp. 40–60, 2015. DOI: 10.1016/j.nima.2014.12.116.
- [17] L. Rota *et al.*, “A PCIe DMA architecture for multi-gigabyte per second data transmission,” *IEEE Transactions on Nuclear Science*, vol. 62, no. 3, pp. 972–976, 2015. DOI: 10.1109/TNS.2015.2426877.
- [18] A. Shkarin *et al.*, “An open source GPU accelerated framework for flexible algebraic reconstruction at synchrotron light sources,” *Fundam. Inform.*, vol. 141, no. 2-3, pp. 259–274, 2015. DOI: 10.3233/FI-2015-1275.
- [19] R. Shkarin *et al.*, “GPU-optimized Direct Fourier method for on-line tomography,” *Fundam. Inform.*, vol. 141, no. 2-3, pp. 245–258, 2015. DOI: 10.3233/FI-2015-1274.
- [20] U. Stevanovic *et al.*, “A control system and streaming DAQ platform with image-based trigger for X-ray imaging,” *IEEE Transactions on Nuclear Science*, vol. 62, no. 3, pp. 911–918, 2015. DOI: 10.1109/TNS.2015.2425911.
- [21] M. Caselle *et al.*, “Ultrafast streaming camera platform for scientific applications,” *IEEE Transactions on Nuclear Science*, vol. 60, no. 5, pp. 3669–3677, 2013. DOI: 10.1109/TNS.2013.2252528.
- [22] M. Vogelgesang *et al.*, “UFO: A scalable GPU-based image processing framework for on-line monitoring,” in *Proceedings of The 14th IEEE Conference on High Performance Computing and Communication & The 9th IEEE International Conference on Embedded Software and Systems (HPCC-ICSS)*, ser. HPCC '12, Liverpool, UK, Jun. 2012, pp. 824–829. DOI: 10.1109/HPCC.2012.116.
- [23] S. Chilingaryan *et al.*, “A GPU-based architecture for real-time data assessment at synchrotron experiments,” *IEEE Transactions on Nuclear Science*, vol. 58, no. 4, pp. 1447–1455, 2011. DOI: 10.1109/TNS.2011.2141686.
- [24] A. Chilingarian *et al.*, “Ground-based observations of thunderstorm-correlated fluxes of high-energy electrons, gamma rays, and neutrons,” *Phys. Rev. D*, vol. 82, p. 043009, 4 Aug. 2010. DOI: 10.1103/PhysRevD.82.043009.
- [25] S. Chilingaryan *et al.*, “Advanced data extraction infrastructure: Web based system for management of time series data,” *Journal of Physics: Conference Series*, vol. 219, no. 4, p. 042034, Apr. 2010. DOI: 10.1088/1742-6596/219/4/042034.
- [26] S. Chilingaryan, “The XMLBench project: Comparison of fast, multi-platform XML libraries,” no. 5667, pp. 21–34, 2009. DOI: 10.1007/978-3-642-04205-8_4.

- [27] S. Chilingaryan *et al.*, “Advanced data acquisition system for SEVAN,” *Advances in Space Research*, vol. 43, no. 4, pp. 717–720, 2009. DOI: 10.1016/j.asr.2008.10.008.
- [28] W. Eppler *et al.*, “New control system aspects for physical experiments,” *IEEE Transactions on Nuclear Science*, vol. 51, no. 3, pp. 482–488, 2004. DOI: 10.1109/TNS.2004.828633.
- [29] A. Vardanyan *et al.*, “Fast pattern recognition trigger for atmospheric cherenkov telescopes,” in *Proceedings of 27th International Cosmic Ray Conference, Katlenburg-Lindau, Germany*, 2001, pp. 2935–2938.

SELECTED PRESENTATIONS

Conferences

- Oct 2019 (invited) “*Accelerating Remote Visualization of Large Tomographic Data Volumes*” at Global Innovation Forum, Armenia
- Oct 2018 (talk) “*Balancing load of GPU subsystems to accelerate image reconstruction in parallel beam tomography*” at SBAC-PAD 2018 conference, Lyon, France
- Okt 2014 (talk) “*Computing Infrastructure for Online Monitoring and Control of High-throughput DAQ Electronics*” at 10th PCAPAC conference, Karlsruhe, Germany
- Sep 2014 (invited) “*UFO – Status and Perspectives of Ultrafast X-Ray Imaging at ANKA*” and “*Fast Reconstruction Algorithms for Computed Tomography*” at SNI 2014, Germany
- Jun 2012 (talk) “*A High Throughput Platform for Real-Time X-ray Imaging*” and “*Advanced Linux PCI Services*” at 18th IEEE Real-Time Conference, Berkeley, CA, USA
- May 2012 (talk) “*A High Performance Platform for Real-Time X-ray Imaging*” at GPU Technology Conference, San Jose, CA, USA
- May 2010 (talk) “*A GPU-based Architecture for Real-Time Data Assessment at Synchrotron Experiments*” at 17th IEEE Real-Time Conference, Lisbon, Portugal
- Apr 2009 (talk) “*Comparison of fast multi-platform XML Libraries: Results for January 2009*” at BenchmarX’09 workshop at DASFAA 2009, Brisbane, Australia
- Sep 2007 (talk) “*Advanced Data Acquisition System for SEVAN*” at SEE 2007 Symposium, Athens, Greece

Workshops

- Sep 2025 (invited) “*Data and Infrastructure challenges in multi-decade monitoring systems*” at TEPA workshop, Yerevan, Armenia
- Sep 2024 (invited) “*Acquiring and Managing Experimental Data in a Big Data Age*” at TEPA workshop, Yerevan, Armenia
- Sep 2023 (invited) “*Leveraging scientific notebooks & LLM agents to perform analysis of SEVAN data*” at TEPA workshop, Nor-Amberd, Armenia
- Mar 2019 (talk) “*UFO Cloud: Data-Acquisition-as-a-Service*” at Matter and Technologie program meeting, Germany
- Nov 2018 (talk) “*High-Speed Tomography: Fine-tuning back projection for GPU architectures*” at CAMERA workshop, Berkeley, CA, USA
- Nov 2017 (invited) “*UFO - A platform for high data rate instrumentation with GPUs*” at EUCALL GPU/FPGA Workshop at XFEL, Hamburg, Germany
- May 2017 (invited) “*SHApe: Scalable and Highly Available Platform for Scientific Data Portals*” at ARBRA Workshop, Nor-Amberd, Armenia
- Apr 2017 (invited) “*Tuning tomographic reconstruction for different parallel architectures*” at workshop on Real-Time 3D Tomography, CWI, Amsterdam, Netherlands
- Jan 2016 (invited) “*Performance-oriented instrumentation for high-speed synchrotron imaging*” at workshop on Large Scale Tomography, Szeged, Hungary
- Apr 2012 (invited) “*ADEI for Tango*” at Tango workshop, MAX-IV, Lund, Sweden
- Mar 2012 (talk) “*Practical Experience with GPUs for high throughput computing*” at HDRI/PanData workshop
- Mar 2011 (invited) “*High Speed Tomography at KIT*” at meeting on Tomographic reconstruction software, ESRF
- Sep 2008 (talk) “*Advanced Data Extraction Infrastructure*” at FORGES 2008 workshop, Nor-Amberd, Armenia

Seminars

- May 2020 (talk) “*Real-time reconstruction for synchrotron tomography*” at lunch-and-learn session at University of Manchester, UK

Oct 2018	(talk) <i>“Balancing load of GPU subsystems to accelerate back projection for synchrotron tomography”</i> at ESRF, Grenoble, France
Apr 2016	(talk) <i>“ADEI: Intelligent visualization and management of time-series data in scientific experiments”</i> at Instituto de Física, UNAM, Mexico
May 2015	(talk) <i>“Advanced Algorithms for Tomography”</i> at YerPhI seminar, Yerevan, Armenia
Sep 2013	(talk) <i>“Ultrafast X-Ray Imaging of Scientific Processes”</i> at SCI and TPU, Russia