

Viktor Sanca

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Education

- 2018 - EDIC Doctoral School, Data-Intensive Applications and Systems Laboratory
EPFL, Lausanne, Switzerland
Thesis proposal: Workload-Conscious Approximate Analytics
Thesis advisor: Prof. Anastasia Ailamaki (anastasia.ailamaki@epfl.ch)
Research interests: approximate query processing, data management, cloud computing, analytical query processing, ML for systems, systems for ML, modern hardware, and adaptive systems.
- 2017 - 2018 Master's Research Scholar Program in Computer Science
DIAS Lab, EPFL, Lausanne, Switzerland
- 2013 - 2017 Bachelor with Honors in Electrical and Computer Engineering
Computing and Control Engineering, Applied Computer Science and Informatics
Faculty of Technical Sciences, Novi Sad, Serbia. GPA: 10.00/10.00.

Publications

- 2023 Post-Moore's Law Fusion: High-Bandwidth Memory, Accelerators, and Native Half-Precision Processing for CPU-Local Analytics
Viktor Sanca and Anastasia Ailamaki.
To appear at ADMS – collocated with VLDB, 2023.
- Efficient K-means Clustering using Speculation
Stefan Igescu, Viktor Sanca, Eleni Zapridou, and Anastasia Ailamaki.
To appear at AIDB – collocated with VLDB, 2023.
- Chaosity: Understanding Contemporary NUMA-architectures
Hamish Nicholson, Andreea Nica, Aunn Raza, Viktor Sanca, and Anastasia Ailamaki.
To appear at TPC-TC – collocated with VLDB, 2023.
- LAQy: Efficient and Reusable Query Approximations via Lazy Sampling
Viktor Sanca, Periklis Chrysogelos, and Anastasia Ailamaki.
SIGMOD, 2023. <https://dl.acm.org/doi/10.1145/3589319>
- Analytical Engines with Context-Rich Processing: Towards Efficient Next-Generation Analytics
Viktor Sanca and Anastasia Ailamaki.
Special vision paper track at ICDE'23. Preprint: <https://arxiv.org/abs/2212.07517>
- 2022 Sampling-Based AQP in Modern Analytical Engines
Viktor Sanca and Anastasia Ailamaki.
DaMoN – collocated with SIGMOD, 2022. <https://dl.acm.org/doi/10.1145/3533737.3535095>
- 2021 Accelerating Complex Analytics Using Speculation
Panagiotis Sioulas, Viktor Sanca, Ioannis Mytilinis, and Anastasia Ailamaki.
CIDR, 2021. https://www.cidrdb.org/cidr2021/papers/cidr2021_paper03.pdf

Fellowships and Scholarships

- 2018 - 2019 EPFL EDIC Doctoral Fellowship
EDIC Doctoral School Fellowship, EPFL
- 2017 - 2018 EPFL Computer Science Research Scholars Program
Data-Intensive Applications and Systems Lab, EPFL

- 2015 - 2017 University of Novi Sad Scholarship
Fund for the Facilitation of Progress of Young Researchers, Talented Students, and Artists
- 2014 - 2015 Serbian Ministry of Education, Science, and Technological Progress Fellowship
State-awarded scholarship

Awards

- 2020, 2021, 2022 Distinguished service award
Awarded by EDIC Doctoral School, EPFL
- 2022 Teaching assistant award
Awarded by EDIC Doctoral School, EPFL
- 2017 The best student in the Faculty of Technical Sciences
For the class that started in 2013/2014 – among all the sections of the Faculty
Awarded by the Faculty of Technical Sciences, University of Novi Sad
Exceptional award for overall undergraduate studies
Awarded by the University of Novi Sad (obtained perfect GPA of 10.00/10.00)
Momčilo Momo Novković Charter
“For the enthusiasm and exceptional results in curricular and extracurricular activities during studies, for dedication to pedagogical work and contribution in promotion of Faculty of Technical Sciences on the national and international level” – bachelor student category
Awarded annually to a student per study level of the Faculty of Technical Sciences
- 2014, 2015, 2016 Exceptional award for accomplishments in studies
Awarded by the University of Novi Sad (maintaining a GPA of 10.00/10.00)
- 2015 University award for the student scientific and research paper
The semantics of Programming Languages. **Awarded by the University of Novi Sad**

Student Theses

- 2023 Sequential Pattern Mining in Very Large Data Streams
Sebastien Ollquist, Master’s Thesis – Swisscom. Co-supervisor at DIAS lab.
- 2022 – 2023 Distance-Based Anomaly Detection
Youssef Saied, Master’s Thesis – done at Oracle Zurich. Co-supervisor at DIAS lab.
- 2019 In-Memory Graph Query Runtime Inside Relational Databases
Ciprian Baetu, Master’s Thesis – done at Oracle Labs Zurich. Co-supervisor at DIAS lab.

Teaching

- 2023 Design of a new undergraduate course: *Data Intensive Systems* (CS-300)
Professors: Anastasia Ailamaki, Sanidhya Kashyap. Spring semester.
Role: Assisting in designing an evolution of the *Introduction to Database Systems* (CS-322), emphasizing practical work to reinforce the theoretical concepts learned during the class, and with a greater focus on synthesizing data management and operating systems.
- 2020 - 2023 Head teaching assistant: *Introduction to Database Systems* (CS-322)
Professors: Anastasia Ailamaki, Christoph Koch. Spring semester.
Role: Creating and improving the teaching materials, exams, and infrastructure for 270 students and mentoring, guiding, and managing 6 junior teaching assistants, and transferring the course materials to support fully online and hybrid teaching and examination for reduced on-site presence.
- 2019 - 2020 Initiated and co-designed *Machine Learning for Database Systems* (CS-726)
Professors: Anastasia Ailamaki, Christoph Koch. Fall semester.
- 2019 - 2021 Teaching assistant: *Introduction, Calcul, Communication* course (CS-119d)
Professor: Jean-Cedric Chappelier. Fall semester.
- 2019 Teaching assistant: *Introduction to Database Systems* (CS-322)
Professors: Anastasia Ailamaki, Christoph Koch. Spring semester.

Professional Activities

- 2019 - EPFL IC Ph.D. Student Organization (EPIC) Committee Member
EPFL, Lausanne, Switzerland. epic.epfl.ch
Role: Faculty and industry talk coordinator bringing together the faculty, alumni, industry, and student community to exchange ideas and experiences. This provides a doctoral-school level platform to get together and interact with distinguished faculty members more directly and informally and a forum for discussing challenges and opportunities in industry and organizations.
- 2019 - 2021 EU H2020 Project: Sustainable Data Lakes for Extreme-Scale Analytics
EPFL, Lausanne, Switzerland. www.smartdatalake.eu
Role: Research and development on top of the in-house high-performance heterogeneous analytical engine Proteus (www.proteusdb.com) to enable storage tiering, approximate query processing, and high-performance integration with project components of other participating partners, especially with the RAW labs and TU Eindhoven research and industrial partners. Presenting and discussing the progress, design, and research ideas with the project partners and preparing, reviewing, and participating in the project reporting and presentations, leading to successful project evaluation.
- 2017 - 2018 EU ERC 2017 PoC: ViDaR: R-enabled large-scale data analytics in ViDa
EPFL, Lausanne, Switzerland. Supervisors: Odysseas Papapetrou, Tahir Azim
Role: Research and development for developing an R-based interface to enable faster analytics with low additional coding overhead for scientific users while keeping interoperability with existing tools and libraries, on top of the high-performance in-house analytical engine Proteus. Explored the full system stack and low-level system primitives written in C++/LLVM, learned high-performance analytics, query optimization in Apache Calcite, and the language primitives of the R programming language, and developed and evaluated a successful system prototype.
- 2016 Summer@EPFL
EPFL, Lausanne, Switzerland. Data-Intensive Applications and Systems Lab
Supervisor: Darius Šidlauskas
Role: Research and development to improve the usability of cutting-edge research prototypes of spatial indexes written in C++ by exposing the functionality to users in the Python ecosystem. Developed and benchmarked low-overhead code wrappers and demonstrated the interoperability of the existing high-performance codebase by simulating a scientific workflow fully in Jupyter Notebooks, showing how to improve the usability of system prototypes without having to reimplement the codebase on the platform and languages of the intended users.

Languages

- Serbian: Native speaker
English: Fluent (*Certificate in Advanced English, University of Cambridge, grade: A, level C2*)
Hungarian: Conversational
German: Beginner
French: Intermediate (*EPFL Centre des Langues, level B1*)

Technical Skills and Interests

- System: Unix, Windows
Programming: C++, Scala, LLVM, VHDL, C, C#, Assembly, R, Java, Python, SQL, PL/SQL, JavaScript
Software: LaTeX, Matlab, Adobe Suite, Oracle DBMS, MySQL DBMS, familiar with Web technologies
Memberships: EPFL IC PhD Student Association Committee member (2020-2022), ACM, IEEE.
Research interests: Data Management, Approximate Query Processing, High-Performance Analytics, Cloud Computing, Machine Learning for Systems, Systems for Machine Learning, Modern Hardware, and Adaptive Systems.