

Data Intensive Applications and Systems Laboratory  
School of Computer and Communications Sciences  
Ecole Polytechnique Fédérale de Lausanne

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## RESEARCH INTERESTS:

My research focuses on enabling faster, more predictable and cheaper data analysis. To optimize performance and cost of data analytics services, I envision database systems as adaptive engines able to adjust their query execution strategy at runtime to fit the characteristics of the queries, data and underlying hardware. I am also interested in the broad topic of scientific data management, data exploration, query optimization, physical database design, cold storage and hardware-software co-design.

## EDUCATION

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**2010 – 2016**

**École Polytechnique Fédérale de Lausanne, Switzerland**

*PhD in Computer Science*

Ph. D. Thesis: Toward timely, predictable and cost-effective data analytics

Advisor: [Professor Anastasia Ailamaki](#)

**2003 – 2008**

**Faculty of Technical Sciences, University of Novi Sad, Serbia**

*Master in Electrical and Computer Engineering*

M. Sc. Thesis: Historical Server Query Performance Improvement Based on Grid Processing of Dynamic Data

Advisor: [Professor Miroslav Hajdukovic](#)

**Award for the best master thesis in the field of mathematical and computer sciences**

## AWARDS

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- EPFL I&C School achievement award for 2015.
- TCDE 2015 Travel award for attending the International Conference on Data Engineering (ICDE).
- Best poster runner-up award at ICDE 2015.
- Serbian national award “Mileva Marić Einstein” for the best master thesis in the field of mathematical and computer sciences in 2008.
- Student of the promotion at the Faculty of Technical Sciences in 2008.
- Proclaimed one of the best 100 students in Serbia by the Government of Serbia in 2007.
- Awards given by the University of Novi Sad for excellent results achieved at the Faculty of Technical Sciences in 2007/08, 2006/07, 2005/06, 2004/05 and 2003/04 academic years.

## FELLOWSHIPS

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- Dositeja Fellowship from the Serbian Government for students studying abroad, 2012-2013.
- EPFL I&C School fellowship student, 2010-2011.
- DMS Group Ltd. fellowship student (mentoring program), 2005-2008.

## PUBLICATIONS

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- **Toward Timely, Predictable and Cost-effective Data Analytics.** R. Borovica-Gajic. PhD Thesis, EPFL, 2016.
- **Cheap Data Analytics Using Cold Storage Devices.** R. Borovica-Gajic, R. Appuswamy, and A. Ailamaki. The 42<sup>nd</sup> International Conference on Very Large Data Bases (**VLDB**), 2016.
- **Smooth Scan: Statistics-oblivious Access Paths.** R. Borovica-Gajic, S. Idreos, A. Ailamaki, M. Zukowski and C. Fraser. The 31<sup>st</sup> International Conference on Data Engineering (**ICDE**), 2015.
- **NoDB: Efficient Query Execution on Raw Data Files.** I. Alagiannis, R. Borovica-Gajic, M. Branco, S. Idreos, and A. Ailamaki. Communications of the **ACM, Research Highlights**, 2015.
- **NoDB in Action: Adaptive Query Processing on Raw Data (demo).** I. Alagiannis, R. Borovica, M. Branco, S. Idreos and A. Ailamaki. The 38<sup>th</sup> International Conference on Very Large Data Bases (**VLDB**), 2012.
- **Automated Physical Designers: What You See is (Not) What You Get.** R. Borovica, I. Alagiannis and A. Ailamaki. The 5<sup>th</sup> International Workshop on Testing Database Systems (**DBTest**), 2012.
- **NoDB: Efficient Query Execution on Raw Data Files.** I. Alagiannis, R. Borovica, M. Branco, S. Idreos and A. Ailamaki. ACM International Conference on Management of Data (**SIGMOD**), 2012.
- **Challenges and Opportunities in Self-Managing Scientific Databases.** T. Heinis, M. Branco, I. Alagiannis, R. Borovica, F. Tauheed and A. Ailamaki. IEEE Data Engineering Bulletin, vol. 34(4), p. 44-52, (**DEB**), 2011.

## PATENTS

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- **Query Management System and Engine Allowing for Efficient Query Execution on Raw Data Files.** A. Ailamaki, S. Idreos, I. Alagiannis, R. Borovica, and M. Branco (US 9298754, 03/29/2016)

## TEACHING ACTIVITIES

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- **Introduction to programming** (Java course, 320 students) with Prof. Jamila Sam. EPFL, Fall 2014.
- **Programming I** (C course, 50 students) with Prof. Jean-Luc Desbiolles. EPFL, Spring 2014.
- **Project in informatics** (C++ course, 90 students) with Prof. Jamila Sam. EPFL, Fall 2013.
- **Computer-aided engineering II** (C++ course, 200 students) with Prof. Jamila Sam. EPFL, Spring 2013.
- **Introduction to OO programming** (Java course, 280 students) with Prof. Jamila Sam. EPFL, Fall 2012.
- **Computer-aided engineering** (C++ course, 230 students) with Prof. Jamila Sam. EPFL, Spring 2012.
- **Introduction to programming** (Java course, 230 students) with Prof. Jamila Sam. EPFL, Fall 2011.
- **Programming** (Java course, 200 students) taught by Prof. Thomas Lochmatter. EPFL, Spring 2011.

## STUDENT MENTORING

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- Alejandro Rivas: "Multi-way joins in SparkSQL", master semester project. EPFL, Spring 2016.
- Dimitrios Sarigiannis: "Data Analytics on Cold Storage", master semester project. EPFL, Spring 2016.
- Lisa Zhou: "Implementing prefetching in PostgreSQL", master semester project. EPFL, Spring 2016.
- Arnold Lacko: "View matching for arbitrary SQL workloads", summer intern project. EPFL, Summer 2015.
- Alejandro Naser: "View selection for arbitrary SQL workloads", summer intern project. EPFL, Summer 2015.
- Alejandro Rivas: "Cardinality injection in PostgreSQL", bachelor semester project. EPFL, Spring 2014.

## WORK EXPERIENCE

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- September 2010 - present

Institution: **École Polytechnique Fédérale de Lausanne (Lausanne, Switzerland)**  
Occupation: Research assistant in the Data-Intensive Applications and Systems Laboratory (DIAS) working under the supervision of Professor Anastasia Ailamaki

Responsibilities: Developed algorithms incorporated in PostgreSQL to increase the predictability of DBMS with respect to changing workload, data and hardware characteristics. (C, Java)

Teaching assistant for several courses (C, Java, C++) throughout 6 years  
Leading and supervising undergraduate students

- **June 2013 – September 2013**

Institution: **MICROSOFT Research (Redmond, WA, USA)**

Occupation: Research Intern (Data Management, Exploration and Mining Group) supervised by Dr. Surajit Chaudhuri, Dr. Vivek Narasayya and Dr. Christian Konig

Responsibilities: Developed an algorithm to propose a set of robust plans for parameterized queries. (C#, C++)

- **June 2005 – August 2010**

Institution: **DMS Group LTD (Novi Sad, Serbia)**

Occupation: Senior Software Engineer (Database Team)

Responsibilities: Developed a compression algorithm for load flow curves in Historian (C#, TSQL)  
Developed a web application for collecting information about installed products and patches that enables history playback. (EJB, Oracle ADF)

- **March 2008 – March 2009** (Contractor)

Institution: **SIEMENS Energy Inc. (Minneapolis, Minnesota, USA)**

Occupation: Software Developer (Database Team)

Responsibilities: Developed a Historical Information System (HIS) v2. Implemented a Grid Processor, Storage Processor, Export–Import module. (PL/SQL, C, Python)

## **TECHNICAL SKILLS**

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Programming languages: C, C++, Java, C#, PL/SQL, TSQL  
DBMS: PostgreSQL, ORACLE 10g, MS SQL Server, DB2, MySQL  
Script languages: Bash  
Platforms: Windows, Linux, Mac  
Development Environment: Eclipse, Visual Studio, SQL Developer, Power Designer  
Version control systems: CVS, SVN, Git

## **LANGUAGES**

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• Serbian (Native)      • English (Full professional proficiency)      • French (B1)

## **REFERENCES**

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Professor Anastasia Ailamaki  
Full Professor, École Polytechnique Fédérale de Lausanne

Dr. Surajit Chaudhuri  
Deputy Managing Director/ Distinguished Scientist,  
Microsoft Research

Professor Stratos Idreos  
Assistant Professor, Harvard University

Dr. Goetz Graefe  
Principal Scientist, Google

Dr. Vivek Narasayya  
Principal Researcher, Microsoft Research