

Mihailo Kaplarevic, Ph.D.

Personal Info

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Professional Profile

Dr. Mihailo Kaplarevic is a well-rounded individual with broad technical knowledge in project planning and management, data management, and system performance analysis. He has over 10 years of experience in large-scale relational, non-relational, and object-oriented databases; applied algorithms and applications; data mining and analysis; and high performance computing. Dr. Kaplarevic has published scientific articles in peer-reviewed journals in the areas of bioinformatics, cross-platform optimizations, and sequential and parallel computer architectures. Specifically, Dr. Kaplarevic is considered a subject matter expert in large-scale data storage and mining, cloud computing, high-performance cluster computing, and cross platform porting. This expertise has been called on frequently by the National Science Foundation through participation in their biotechnology and information science panels. Dr. Kaplarevic has hands-on expert-level knowledge of a wide range of computational platforms from Windows/Linux servers to high-performance clusters to shared-memory systems.

Technical Skills

- Programming languages: C, C++, Java, Php, Perl (BioPerl), Linux scripting
 - 10 years of experience on profiling diverse applications, pinpointing performance bottlenecks and making cross-platform optimizations
 - 10 years of experience in analyzing, processing and storing large datasets
 - 10 years of experience in project planning and management, and system performance analysis
 - Expert knowledge of sequential and high-performance parallel computer architecture
 - Excellent background and strong problem-solving capability in entity-relational databases, object oriented databases, applied algorithms and applications, and high-performance computing
 - Expert knowledge of high performance computing (PVM, MPI, OpenMP, pthread), Linux clusters, shared memory systems, and porting applications to different platforms
 - Operating Systems: Windows (admin level), LINUX (admin level), MAC OSX (admin level)
 - MySQL, Postgres and ORACLE database design and administration
 - Web Platforms: HTML, Dreamweaver, Macromedia Flash, LIMP servers, and dynamic portals
 - Extensive experience in technical writing
 - Excellent oral and written communication in multiple languages
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Key Projects

- Professional Masters in Bioinformatics – Assisted in program, curriculum, and policy development for University of Delaware's new masters program
- Distributed data security and selective access (protocol development and implementation)
- Optimization In High-Capacity Genomic Data Storage and Retrieval (DB structure and SQL optimization)
- Environmental Genome Informational Utility System (EnGENIUS) – A complete web based metagenome analysis system: <http://ocean.dbi.udel.edu> (Case study: Metagenome Alvinella Pompejana Dataset)
- UPSTREAMER (Upstream Speculative Promoter Sequence Search Tool and Database)
- GRACEST (Gene Recognition and Comparison Using ESTs)
- Various research projects in compilers and compiler optimizations (available upon request)

Work Experience

Research Assistant Professor

JULY 2008 - PRESENT

Computer and Information Science Department, University of Delaware

- Propose, develop, and manage projects with faculty, customers, and vendors that utilize large-scale research data and knowledge base
- Lead research teams of up to 15 graduate students
- Develop model concepts and approaches as an individual researcher and act independently on technical matters
- Make authoritative decisions and recommendations that have a major impact on scientific research activities such as defining project timelines, selecting computational hardware, leading research teams etc.
- Prepare competitive grant proposals to obtain funding in support of research activities
- Serve as a primary investigator or co-investigator on projects of complexity and scope consistent with above criteria
- Prepare analysis, reports, and other documentation for publication
- Present findings at local, national and/or international meetings

Bioinformatics Associate Scientist

JAN. 2007 – PRESENT

Delaware Biotechnology Institute

- Conceptualize and implement algorithms and approaches to create solutions for complex computational/informational challenges
- Lead and participate in planning, organizing, and guiding extensive research programs and activities
- Interpret, organize, execute, and coordinate diverse computational assignments concerned with unique and highly complex problems
- Maintain an expert, broad knowledge of state-of-the-art technology, software, and systems
- Administer and maintain diverse OS computational systems and deploy required services
- Provide network support, monitoring and maintenance
- Oversee installation, training, and maintenance of the software and hardware used across the Institute (computational and database cluster)

Research Assistant

SEP. 2001 – MAY 2006

University of Delaware

- Research in the area of parallel and high-performance computing
- Teaching appointments

Bioinformatics Associate Scientist

JAN. 2007 - PRESENT

Computational Core Center, Delaware Biotechnology Institute,
University of Delaware

Research Assistant

SEP. 2001 - DEC. 2006

Bioinformatics Group, Computer Architecture and Parallel Systems
Laboratory Department of Electrical and Computer Engineering

Advisor: Professor Guang R. Gao

Co-advisor: Professor Craig Cary, College of Marine Studies, University of Delaware

Co-advisor: Professor Alison Murray, Desert Research Institute, Reno Nevada

US NAVY, Alvin Scientific Crew Member

NOV. 2004 - DEC. 2004

<http://www.ceoe.udel.edu/extreme2004/mission/divemission/index.html>

Metagenome Research Group Team Leader

AUG. 2002 - JAN. 2007

Computer Architecture and Parallel Systems Laboratory (CAPSL),
University of Delaware

Education

University of Delaware

Ph.D. in Electrical and Computer Engineering with the concentration in Biomedical
Engineering, GPA 3.9/4.0

Dissertation: "Advanced Informational System Framework for Analysis of Incomplete
Environmental Metagenome Datasets"

University of Belgrade, School of Electrical Engineering

Combined B. Sc. and M.S. in Electrical and Computer Engineering

Thesis: "Object Oriented Database Modeling and Optimization Techniques"

Services

- Frequent grant review panelist at Directorate for Biological Sciences, National Science Foundation
- Peer reviews for accredited journals in the area of parallel computing and bioinformatics (list of journals available upon request)
- Participated in the Graduate Program Planning - Professional Masters In Bioinformatics University of Delaware Faculty Senate

Key Publications

- Hammond, S., Swanberg, J., Kaplarevic, M., and Lee, H.K., Genomic sequencing and analysis of a Chinese Hamster ovary cell line using Illumina sequencing technology, BMC Genomics (Accepted on 01/17/11)
- Kaplarevic, M., Mahaling, G., Meyers B., Distributed Databases Applications in Next Generation Sequencing (in review)
- Kaplarevic, M., Murray, A.E., Environmental Genome Informational Utility System (EnGENIUS), Journal of Bioinformatics and Computational Biology (Dec. 2008.)
- Mahalingam, G., Mayers, B., and Kaplarevic, M., Application of distributed database methodology in high-throughput large-scale genomic datasets. Bioinformatics (In review)

- Grzymiski, J.J., Murray, A.E., Campbell, B.J., Kaplarevic, M., Gao, G., Lee, C., Daniel, R., Ghadiri, A., Feldman, R., and Cary, S.C., Metagenome analysis of an extreme microbial symbiosis reveals eurythermal adaptation and metabolic flexibility. Proceedings of the National Academy of Science USA (In press)
- H. Wu, M. Kaplarevic, L. Li, G. Gao, SOS: Segment-based Optimization Search – A New Empirical Methodology. (PLDI 2007)
- Kaplarevic, M., Design and development of a metagenome database and annotation pipeline, American Society for Microbiology General Meeting, New Orleans, LA (May 2004.)
- Cary, S.C., Kaplarevic, M., Murray, A.E., Exploring genomes of non-model microbial systems: A meta-genome level analysis of a complex microbial symbiosis from an extreme environment. Ecological, Evolutionary, and Functional Genomics - Gordon Conference, New London NH, (Aug. 2003.)
- Kaplarevic, M., Gao, G., UPSTREAMER (Speculative promoter search tool) IEEE Computer Society Bioinformatics Conference (CSB2002), Stanford University, Palo Alto, CA

Extended list available upon request.

References

Dr. Karl V. Steiner

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Dr. Stephen C. Cary

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