EVGENIA-MARIA (EUGENIA) S. KONTOPOULOU

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EMPLOYMENT

The MathWorks Inc. **Natick, MA**

▷ **Senior Application Support Engineer** **Nov 2020 - today**

- Research, design, implementation and testing/optimization of software for the Optimization Toolbox, MATLAB Math, Risk Management Toolbox, Fixed Point Designer, Machine Learning & Statistics Toolbox and MATLAB Engine.
- Support and effective communication with customers to advise on technical issues.
- Leading of my team to high numbers of customer satisfaction and the highest service rates of the last two years.
- Leverage Agile for effective project management and software delivery.
- Improvement of procedures that target the effective communication with customers and training new hires on them.

▷ **Software Engineer Intern** **May 2019 - August 2019**

- Implemented and deployed functions for the computation of convolution in half precision.
- Implemented and deployed functions for the computation of exponential and logarithmic functions in half precision.

▷ **Software Engineer Intern** **May 2018 - November 2018**

- Developed, designed and implemented algorithms for the double precision computation of trigonometric scalar function using FPGAs.
- Implemented and deployed functions for the computation of trigonometric and transcendental functions in half precision using CPUs.

Purdue University **West Lafayette, IN**

▷ **Research Assistant** **August 2016 - August 2020**

- Effectively managed 6 courses, 2 internships and publication of 6 research papers in top journals in 4 years.
- Effectively led 2-3 research projects simultaneously.
- Demonstrated strong verbal skills through several presentations in conferences and written skills through publications.

Rensselaer Polytechnic Institute **Troy, NY**

▷ **Research Visitor** **August 2015 - August 2016**

- Design,analysis prototype, implementation and testing of Randomized Numerical Linear Algebra algorithms for matrix functions.
- Recitations, grading and office hours for the courses of "Cryptography" and "Foundations of Computer Science".

University of Patras **Patras,Greece**

▷ **Teaching & Research Assistant** **June 2012 - June 2015**

- Development of various methods for the Text-to-Matrix Generator MATLAB Toolbox.
- Publication of two papers.
- Recitations, grading and hold of office hours for the courses of "Scientific Computing", "Linear Algebra" and "Numerical Analysis".

TECHNICAL SKILLS

MATLAB, C++, C, Python, PHP, HTML, CSS, OPENMP, MPI, Perl

EDUCATION

Purdue University, IN, USA Computer Science
Doctor of Philosophy (Ph.D.) *2016-2020*

University of Patras, Patras, Greece Computer Engineering and Informatics
Master in Engineering (M.Eng.) *2006-2012*

OPEN SOURCE SOFTWARE

TeraPCA **C/C++**
GitHub Page

A library that computes the top Principal Components (PCs) of tera-scale matrices using Randomized Singular Value Decomposition (RandSVD). Our implementation is based on multithreaded libraries such as LAPACKE, BLAS and MKL, and it can handle datasets which might exceed the amount of available system memory by performing out-of-core computations.

Large Scale Genetic Data Simulator **C/C++, OpenMP**
GitHub Page

A software that enables fast generation of simulated large scale genetic data using sophisticated random distributions to simulate the genetic patterns.

Text-to-Matrix Generator Version 7.8 **MATLAB**

Version 7.8 introduces a new set of operations. More specifically we implemented deterministic and partially randomized algorithms for skeleton matrix decomposition. The skeleton matrix decomposition methods (e.g. CUR, CX, RRQR e.t.c.) utilize scaled parts of the initial matrix to derive highly accurate and interpretable approximations of the term-by-document matrix.

Text-to-Matrix Generator Version 6.7 **MATLAB, Perl**
Software Page

The highlights of version 6.7 are the incorporation of filters that enable parsing and prepossessing non-ASCII documents and additional options that rule the construction of the dictionary. Users can process a variety of data formats (e.g., pdf, docx, doc, ps e.t.c.) and select among many more options on how to construct the dictionary (e.g., exclude alphanumerics, numerics e.t.c.).

SELECTED AWARDS (7 OF 12)

- Nomination for the Google Fellowship 2019 (one of the two nominees selected university-wise) **December 2018**
- John R. Rice Partial Fellowship in Scientific Computing **April 2018**
- Gerondelis Foundation Scholarship **November 2017**
- NSF grant for XX Householder Symposium on Numerical Linear Algebra (attendance only by invitation) **June 2017**
- Scholarship for the Gene Golub SIAM Summer School (only 50 people worldwide are selected to attend) **June 2015**
- NAG Prize for the Best Presentation in Session, 2013 ERCIM **December 2013**
- SIGWEB Ted Nelson Newcomer Award, ACM Hypertext 2012 Conference **June 2012**

PUBLICATIONS

1. E. Kontopoulou, *"Randomized Numerical Linear Algebra Approaches for Approximating Matrix Functions"*, Ph.D. Dissertation (2020), Purdue University
2. E. Kontopoulou, G. Dexter, W. Szpankowski, A. Grama, P. Drineas, *"Randomized Linear Algebra Approaches to Estimate the Von Neumann Entropy of Density Matrices"*, IEEE Transactions on Information Theory (2020), Vol. 66, Issue 8, pp. 5003-5021
3. A. Bose, V. Kalantzis, E. Kontopoulou, M. Elkady, P. Paschou, P. Drineas, *"TeraPCA: a Fast and Scalable Software Package to Study Genetic Variation in Tera-scale Genotypes"*, in Oxford Bioinformatics (2019), Issue 1, pp. 3679-3683
4. E. Kontopoulou, A. Grama, W. Szpankowski, P. Drineas, *"Randomized Linear Algebra Approaches to Estimate the Von Neumann Entropy of Density Matrices"*, in Proceedings of the 2018 IEEE International Symposium on Information Theory (2018), pp. 2486-2490
5. P. Drineas, I. Ipsen, E. Kontopoulou, M. Magdon-Ismail, *"Structural Convergence Results for Low-Rank Approximations from Block Krylov Spaces"*, in SIAM Journal on Matrix Analysis and Applications (2018), Vol. 39, Issue 2, pp. 567-586
6. C. Boutsidis, P. Drineas, P. Kambadur, E. Kontopoulou, A. Zouzias, *"A Randomized Algorithm for Approximating the Log Determinant of a Symmetric Positive Definite Matrix"*, in Linear Algebra and its Applications (2017), Vol. 533, pp. 95-117
7. K. Fountoulakis, A. Kundu, E. Kontopoulou, P. Drineas, *"A Randomized Rounding Algorithm for Sparse PCA"*, in ACM Transactions on Knowledge Discovery from Data (2017), Vol. 11, Issue 3, No. 38, pp. 1-26
8. E. Kontopoulou, M. Predari, E. Gallopoulos, *"Onomatology and Content Analysis of Ergodic Literature"*, in Proceedings of the 3rd ACM Narrative and Hypertext Workshop (2013), No. 5, pp. 1-5
9. E. Kontopoulou, M. Predari, T. Kostakis, E. Gallopoulos, *"Graph and Matrix Metrics to Analyze Ergodic Literature for Children"*, in Proceedings of the 23rd ACM Conference on Hypertext and Social Media (2012), pp. 133–142