

Essam Morsi

Profile of qualifications

- Ph.D. degree of computer engineering with computational science & data science experience
- Extensive experience in HPC on x86 modern processors & Nvidia GPUs
- AI academic and professional experience with technical expertise in O&G reservoir and VMs memory bitmap analysis
- Solid knowledge in cloud computing & virtualization, distributed and parallel systems architecture

Work Experience

Brightskies Tech. co.

Senior HPC systems engineer - [HPC Team Lead]

Feb 2016 - Oct 2019

- On-site technical support and code optimization
 - Seismic-based code optimization: PSTM, PsDM, RTM & FWI
 - Propose and develop an algorithmic-based optimization ideas such as a novel PsTM algorithm achieved 10x speedup and IA x86-based extension to the patch Eikonal solver [presented @ IXPUG 2018]
 - Implement and optimized RTM with memory snapshots, for different memory hierarchy and IOs, using the recently developed Intel's IPP AVX512 [presented @ IXPUG 2018 & ISC-Asia 2018]
 - Implement and compare Sponge, CPML and random-velocities ABCs to find the best compromise between geophysical and computational standpoints [presented @ Saudi-HPC 2019]
 - Initiate and proof an optimization idea for reservoir simulator using machine learning techniques for Aramco's GigaPower simulation team: significant reduction of realization/runs and hence multiple Xs speedup
 - Linear algebra based code optimization: VML, cu/BLAS, LAPACK, MKL.
 - Tree-based load balancing algorithm for reservoir simulator
- Linux server administration & HPC infrastructure management:
 - HPC software stack on UNIX and Linux operating systems
 - Problems troubleshooting, identification & solving
 - Benchmarking system performance and resolving any bottlenecks impacting the overall performance

Nov 2009 - Oct 2012

ICTP, PMU, Ministry of High Education, Giza

Technical Coordinator

Participate in the following technical task:

- Design and Develop arabic name matching algorithm
- Portal project Business analysis Technical committee member
- Develop Live@edu Mail ID Authentication web service for Egyptian universities
- Design/Develop required programs for evaluating the Egyptian universities statistical information

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Education

Nov 2019 - Present

Postdoc. researcher, Inria [DataMove & Sequel teams]: High Performance Deep Reinforcement Learning

Feb 2013 - Nov 2017

Ph.D., Egypt-Japan University for Science and Technology (E-JUST): A Generic Traffic Approach for Synthesization, Monitoring and Forecasting: An Application of Cellular Big-Data on Dakar, Senegal

Mar 2015 - Nov 2015

Visiting research fellow, Green Computing Lab [Kasahara's Lab] - Waseda University, Japan

Feb 2011 - Oct 2012

M.Sc., Computer Engineering Department, Faculty of engineering - Benha university, Egypt: Harvesting Unused Resources for Cloud Computing

Sep 2005 - Jul 2009

B.Sc., Computer Engineering Department, Faculty of engineering - Benha university, Egypt:

- Grade: V. good with honor (Ranked: 1st)
- Project: Document Based Business Management

Teaching Experience

Focus on teaching two main tracks for undergraduate and post-graduate students:

- AI concepts & statistical learning
- Parallel and distributed systems, architecture & programming models

Sep 2017 - Oct 2019

Benha University, Faculty of engineering
Assistant Professor - Dept of Computer Engineering

Sep 2010 - Feb 2013

Benha University, Faculty of engineering
Lecturer assistant - Dept of Computer Engineering

Programming & HPC Skills:

Languages: C/C++, Fortran, Python, R, Java & bash scripting
OpenMP, MPI, CUDA, OpenAcc
ML: Pandas, Scikit, TensorFlow, PyTorch
Profiling: Intel vTune Amplifier & advisor,
valgrind, gperf, oprofile & perf
Compilers: ICC, GNU GCC & PGI

Training

Dec 2009

EMC, Smart Village, Egypt
EMC Academic Alliance program [Information Storage & Management]

Oct 2009

Education Partner Airlift - Microsoft Egypt
Live@edu & Microsoft Learning Gateway

Publications

- [1] P. Thierry, S. Gogar, M. Gontier, A. Villarreal, Y. Zavarzin, S. Khlystov, L. Borges, and E. Algizawy, "Evaluation of compression algorithms and memory hierarchies impact within time reversal algorithms," in *2019 SIAM Conference on Computational Science and Engineering*, Washington, USA, Feb. 2019.
- [2] E. Algizawy, T. Ogawa, and A. El-Mahdy, "Real-time large-scale map matching using mobile phone data," *ACM Trans. Knowl. Discov. Data*, vol. 11, no. 4, pp. 52:1–52:38, Jul. 2017.
- [3] A. El-Mahdy, H. ElShishiny, and E. Algizawy, "Smart traffic framework based on dynamic mobile clusters," in *2014 IEEE 3rd International Conference on Cloud Networking (CloudNet) (CLOUDNET'14)*, Luxembourg, Luxembourg, Oct. 2014.
- [4] A. Ahmed, A. Alsammak, and E. Algizawy, "A new approach to manage and utilize cloud computing underused resources," *International Journal of Computer Applications*, vol. 76, no. 11, pp. 29–36, Aug 2013.
- [5] K. Metwaly, K. Elamrawi, E. Algizawy, M. Mahmoud, M. ElBasyouni, and P. Thierry, "Accelerated reverse time migration with optimized io," in *2018 ISC High Performance - Asia [poster]*, Frankfurt, Germany, Jun. 2018.
- [6] E. Algizawy, K. Elamrawi, K. Morad, I. Monir, M. ElBasyouni, K. Metwaly, and P. Thierry, "Highly scalable flexi-trace-based pre-stack time migration," in *IXPUG - 1st Middle East Meeting [poster]*, KAUST, Saudi Arabia, Jun. 2018.
- [7] K. Metwaly, K. Elamrawi, E. Algizawy, M. Mahmoud, M. ElBasyouni, and P. Thierry, "Accelerated reverse time migration with optimized io," in *2017 Intel HPC Developer Conference [poster]*, Denver, USA, Nov. 2017.
- [8] H. El-Shishiny, E. Algizawy, A. El-Mahdy, and M. Baddar, "Road traffic time series analysis, modelling and forecasting based on mobile phonenetwork data," in *ITISE 2016 [poster]*, Granada, Spain, Jun. 2016.
- [9] A. Elmahdy, E. Algizawy, T. Ogawa, H. El-Shishiny, and M. Baddar, "High resolution traffic maps generation using cellular big data," in *Proceedings of the 2015 Net.Mob international conference - D4D [poster]*, 2015.

Research Projects

Sep 2014 - May 2015

Waseda University, IBM Egypt, and E-JUST University
Orange D4D - Road-Level Vehicle Trip Route Determination Using Cellular Big Data: For the first time, mobile call details (Senegal/Orange Sonata) utilized at a 'microscopic' traffic level analysis, modeling and prediction.

Jan 2011

Benha University, Faculty of engineering, Cairo
HP Cloud Computing lab proposal: Participate in preparing cloud computing lab proposal that aid our students in the implementation and host of computer application that raise their capabilities in dealing with Grid/Cloud computing techniques effectively

Jun 2010

ITIDA Research Project Proposal
Effectiveness and Cost Benefits of cloud Computing-Based system for managing universities information system application

Development Projects

Nov 2011

Benha University, Faculty of engineering, Cairo
Laboratories Control System: Design and develop Laboratories control system. The LCS system aims to serve the faculty departments labs maintainable, and scheduling to keep them fully functional using a complete ASP.net web Solution.

Jan 2012

Benha University, Faculty of engineering, Cairo
Courses Specification and Reporting Web Site: Design and develop course specifications web site that helps teaching staff to provide the proficiency and experience necessary for carrying out of undergrad and research purposes, based on specifications stipulated for basic and advanced level university education.

Languages & Interests

Arabic: Mother Tongue.
English: Fluent.
Interests: Reading historical and romantic stories & playing tennis table and chess & charity activities

References

- Dr. Philippe Thierry - philippe.thierry@intel.com [Mentor & collaborator]
- Dr. Khaled Elamrawi - khaled.elamrawi@brightskiesinc.com [ex-Manager]
- Prof. Tetsuji Ogawa - ogawa@pcl.cs.waseda.ac.jp [Advisor]