Curriculum Vitae

Emmanuel N. Mathioudakis

PERSONAL RECORD

Name: Emmanuel N. Mathioudakis
Citizenship: Hellenic
Current Employment: Assistant Professor with tenure
School of Mineral Resources Engineering,
Technical University of Crete.
Affiliate: Member of the Applied Mathematics and
Computers Laboratory
Technical University of Crete.

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EDUCATION

- Ph.D. in Computational and Applied Mathematics, Department of Sciences, Technical University of Crete, Chania, Greece, 2001.
  Thesis Title : "*Iterative methods for the solution of large linear systems on parallel architectures*".
- M.Sc. in Numerical Analysis and High Performance Computing, Department Sciences, Technical University of Crete, Chania, Greece, 1996.
  Thesis Title : "*Scientific computations on parallel environments*".
- B.Sc. (Ptychion) in Mathematics, Department of Mathematics, University of Crete, Greece, 1993.

RESEARCH INTERESTS

My research interests lay in the area of Computational Mathematics and Scientific Computing and more precisely in the area of **Numerical Linear Algebra** and **High performance and Parallel Computing**. Specifically I'm interested in the following subjects:

- Parallel Algorithms/Scientific Computing
- Numerical methods for solving PDEs
- Iterative methods for solving large and sparse linear systems

APPOINTMENTS/PROFESSIONAL EXPERIENCE

- **2013 – Today :** Assistant Professor (*Scientific Computing*), School of Mineral Resources Engineering , Technical University of Crete.
- **2008 – 2013 :** Assistant Professor (*Scientific Computing*), Department of Sciences, Technical University of Crete.
- **2004 – 2008 :** Lecturer (*Scientific Computing*), Department of Sciences, Technical University of Crete.
- **2001 – 2004 :** Visiting Lecturer, Dept of Sciences, Technical University of Crete.

OTHER INFORMATION

Military service at the Hellenic AirForce, September 1998–May 2000.

LANGUAGES

Greek - native or bilingual proficiency.

English - excellent command of written and spoken.

TEACHING EXPERIENCE

Principal Lecturer

Dept. of Mineral Resources Engineering – Dept. of Environmental Engineering, Technical University of Crete, Compulsory Undergraduate Courses:

- 2013 – 2014 Numerical Linear Algebra
- 2013 – 2014 Numerical Analysis

Dept. of Sciences, Technical University of Crete, Compulsory Undergraduate Courses:

- 2004 - 2013 Scientific Computing
- 2004 – 2013 Computer Programming
- 2001 – 2004 Numerical Linear Algebra
- 2001 – 2004 Numerical Analysis

Dept. of Sciences, Technical University of Crete, Postgraduate Courses:

- 2004 - 2009 Matrix Computations and Iterative Methods
- 2004 – 2014 Scientific / Parallel Computing
- 2004 – 2014 Numerical Methods for PDEs (Finite Elements)

Teaching Assistant

Dept. of Sciences, Technical University of Crete, Compulsory Undergraduate Courses:

- 1993 - 2001 Computer Programming - Numerical Linear Algebra – Numerical Analysis

UNIVERSITY SERVICE

- 2009 – Today Member of scientific committee of TUC Grid Computer
- 2004 - 2013 Member of Graduate Studies Committee – Dept. of Sciences
- 2004 – 2005 Member of University Senate

PhD STUDENTS

- B. Mandikas, "*Multistep methods and Grid Computations for linear systems of semi-implicit time step schemes for incompressive flows".* (Completion expected late 2014)

MASTER STUDENTS

1. K. Spanakis, "*Numerical methods for Medical Imaging'*, (Completion expected late 2014)
2. N. Charalampaki, "*CPU-GPU computations for MultiGrid techniques coupled with Fourth-Order Compact discretizations for Isotropic and Anisotropic Poisson problems*', (Completion expected late 2014)
3. N. Vilanakis, *" GPU Numerical solution of large linear systems arising from Finite Element Methods in high performance computing architectures using Graphics Processing Units",* 2013.
4. J. Athanasakis, *" GPU scientific computations for Hermite Collocation Finite Element Method"*, 2012.
5. A. Apostolou, *"Grid Computations and Compact Finite Difference methods for elliptic PDEs"*, 2012.
6. B. Mandikas, "*Grid Computations for the Multigrid finite element Hermite Collocation method", 2008.*
7. E. Petrakis, *"Parallel numerical schemes for hydrodynamic flows"*, 2006.

COMPUTING SKILLS

- Programming languages: FORTRAN, C , MatLab, HPF with MPI – OpenMP & OpenACC
- Sys adm knowledge of UNIX and Windows operating systems.
- Scientific computing software Matlab, Maple and NETLIB routines.
- Sys adm knowledge of UNIX based parallel (multiprocessor / grid) systems

AWARDS

- Best Paper Award of The 2013 International Conference of Parallel and Distributed Computing

Em. Mathioudakis, N. Vilanakis, E. Papadopoulou and Y. Saridakis *"Parallel Iterative Solution of the Hermite Collocation Equations on GPUs", Procs of World Congress on Engineering 2013-WCE 2013, London,UK*

- Certificate of Merit for The 2013 International Conference on Applied and Engineering Mathematics

V. Mandikas, Em. Mathioudakis, E. Papadopoulou and N. Kampanis *"A high order accurate multigrid pressure correction algorithm for incompressible Navier-Stokes equations", Procs of ICAEM2013, Int. Association of Engineers – IAENG, Imperial College, UK*

RESEARCH PROJECTS

- 2012 – 2015 **THALES -** *Advanced mathematical methods and software platform for solving multiphysics – multidomain problems on modern computer architectures : Applications to environmental engineering and medical problems.* (TUC – Un. of Patras – Un. of Thessaly), member of basic research team, (600K euros).
- 2007 -2008 **EPEAEK** – *TUC undergraduate program upgrade.* (TUC)
- 2002 - 2007 **HRAKLEITOS –** *An Innovative method for solving Elliptic PDEs.* (TUC)
- 2004 – 2006 **ARCHIMIDES** – *Solving non-linear geophysics, air pollution and electromagnetic wave propagation problems on parallel computing architectures.* (TUC – Univ. of Athens – TEI of Crete)
- 2004 – 2005 **Basic Research Program** – *Solution of large and sparse linear systems for weather forecast numerical models on parallel architectures*. (TUC)
- 2000 – 2001 **PENED99 ED566** – *High performance computations for scientific and multimedia applications*. (TUC – Univ of Patras)
- 2000 – 2001 **PENED99 1431** – *Adaptive optics with stochastic optimization algorithms in Astronomy* . (TUC – Univ of Crete)

CONTRIBUTED TALKS AND PRESENTATIONS

2013 IC-MSQUARE 2013 -2nd International Conference on Mathematical Modeling in Physical Sciences 2013, Prague, 2013.
2013 ICAEM 2013 - The 2013 International Conference of Applied and Engineering Mathematics, IAENG, Imperial College, U.K.
2013 ICPDC'13 - The 2013 International Conference of Parallel and Distributed Computing - World Congress on Engineering – WCE2013, London, U.K.
2010 ICCAM '10 – International Congress on Computational and Applied Mathematics - Leuven, Belgium
2010 NumAn '10 – Conference in Numerical Analysis 2010 - Chania, Greece
2009 HERCMA '09 – 9th Hellenic-European Research on Comp. Mathematics and its Applications - Athens, Greece
2009 M^{3}ST 09 - International Conference on Modern Mathematical Methods in Science and Technology – Poros, Greece
2008 WCCM8 - 8th World Congress on Computational Mechanics – Venice, Italy
2008 ECCOMAS 2008 - 5th European Congress on Computational Methods in Applied Sciences and Engineering – Italy
2007 XXII International Conference on Applied Computer Science – Prague - Czech Republic
2006 M^{3}ST 06 - International Conference on Modern Mathematical Methods in Science and Technology – Paros, Greece
2006 9th International Conference on Applied Mathematics of World Scientific and Engineering Academy - MATH '06 – Konstantinoupolis - Turkey
2001 NA 2001 - International Conference on Numerical Algorithms 2001 - Marrakesh - Morocco
2001 ENUMATH 2001 - European Conference on Numerical Mathematics and Advanced Applications - Ischia – Italy
2001 5th IMACS on Iterative Methods in Scientific Computing – Heraklio, Greece
1998 HERCMA '98 – 4th Hellenic-European Research on Comp. Mathematics and its Applications - Athens, Greece

SELECTED PUBLICATIONS

- Vilanakis N, Mathioudakis E, "Parallel iterative solution of the Hermite Collocation equations on GPUs II", Journal of Physics: Conference Series, vol. 490, 012097, 2014.

- Mathioudakis E., Vilanakis N., Papadopoulou E., Saridakis Y., "Parallel iterative solution of the hermite collocation equations on GPUs", Lecture Notes in Engineering and Computer Science, vol. 2 LNECS, 1281-1286, 2013.

- Mandikas V., Mathioudakis E., Papadopoulou E., Kampanis N., "A High order accurate multigrid pressure correction algorithm for incompressible navier-stokes equations", Lecture Notes in Engineering and Computer Science, vol. 1 LNECS, 74-79, 2013

- A. I. Delis and E.N. Mathioudakis," A Finite Volume method Parallelization for the Simulation of Free Surface Swallow Water Flows", *Maths and Computers in Simulation,* ELSEVIER, **79**(11), pp. 3339-3359,2009.

- E.N. Mathioudakis and E. P. Papadopoulou," Grid Computing for the Bi-CGSTAB applied to the solution of the Modified Helmholtz equation", *Int J of Applied Maths and Comp Science*, **4**(3),pp 179-184, WASET,2007.

- E.N. Mathioudakis, E. P. Papadopoulou and Y. G. Saridakis," Preconditioning for solving Hermite Collocation by the Bi-CGSTAB ", *Trans on Maths*, **7**(5),pp 811-816, WSEAS,2006.

- E.N. Mathioudakis and E. P. Papadopoulou," MPI Management of Hermite Collocation computation on a Distributed-Shared Memory system ", *Trans on Maths*, **5**(5),pp 520-526, WSEAS,2006.

- E.N. Mathioudakis, E. P. Papadopoulou and Y. G. Saridakis, " Iterative Solution of Elliptic Collocation Systems on a Cognitive Parallel Computer ", *Computers and Maths with Applications*, **48**, pp 951-970, ELSEVIER,2004.

- E.N. Mathioudakis, E. P. Papadopoulou and Y. G. Saridakis," Bi-CGSTAB for Collocation Equations on Distributed Memory Parallel Architectures ",*Numerical Maths and Advanced Applications – ENUMATH 2001*, pp 957-966,SPRINGER,2001.

- E.N. Mathioudakis, E. Papadopoulou, Y .G. Saridakis, "Mapping Parallel Iterative Algorithms for PDE Computations on a Distributed Memory Computer", *Int J of Parallel, Emergent and Distributed Systems (*formerly *Parallel Algorithms and Applications),* **8**, pp141-154, Taylor&Francis, 1996.