

# Nana Dikhaminjia

## PERSONAL DETAILS

DOB: 15.12.1977

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## EDUCATION

*2009-2014*

**Iv. Javakhishvili Tbilisi State University,  
Faculty of Exact and Natural Sciences, Tbilisi, Georgia**

PhD in Computational Mathematics

*1994-1999*

**Sokhumi Branch of Iv. Javakhishvili Tbilisi State  
University,  
Faculty of Physics and Mathematics, Tbilisi, Georgia**

Master of Applied Mathematics

## PROFESSIONAL EXPERIENCE

*2017-present*

**School of Natural Sciences and Engineering,  
Ilia State University, Tbilisi, Georgia**

Professor of Computer and Electrical  
Engineering, Head of Computer Engineering  
Undergraduate Program, Coordinator of ABET  
Committee for Engineering Programs

*2017-present*

**IEEE EMC Transactions**

Associate Editor

*2017-present*

**GIS and RS Consulting Center GeoGraphic, Tbilisi**

Consultant in IT and GIS Projects

*2018 – present*

**National Center for Education Quality Enhancement**

Accreditation and Authorization Expert

*2018 – present*

**EMC Laboratory, Missouri University of Science and  
Technology, Rolla, Missouri, USA**

Research Associate

*2014 – 2017*

**EMC Laboratory, Missouri University of Science and  
Technology, Rolla, Missouri, USA**

Visiting Assistant Research Professor

*2011 – 2012*

**Iv. Javakhishvili Tbilisi State University,  
Faculty of Exact and Natural Sciences, Tbilisi, Georgia**

Invited Lecturer  
Courses: Numerical Analysis 1,  
Numerical Analysis 2

*2001 – 2012*

**I. Vekua Institute of Applied Mathematics, Tbilisi,  
Georgia**

Researcher

*2001 – 2012*

**International Journal “Applied Mathematics,  
Informatics and Mechanics”, Georgia**

Technical Editor

2005 – 2012  
**GIS and RS Consulting Center GeoGraphic, Tbilisi**

2008 – 2009  
**Faculty of Exact and Natural Sciences, Iv. Javakishvili  
Tbilisi State University, Tbilisi, Georgia**

2004 – 2005  
**LTD Studio GeoScope**

2002 – 2003  
**Sokhumi Branch of Iv. Javakishvili Tbilisi State  
University, Faculty of Physics and Mathematics**

Software Developer, GIS Analyst, GIS Trainer

Invited lecturer  
Courses: OOP Language C++,  
Visual Studio

Software developer

Invited lecturer  
Course: Information Technologies

## SCIENTIFIC PROJECTS AND GRANTS

2017-present  
**Dell Inc, Missouri University of Science and Technology,  
EMC Laboratory**

Executor  
*Machine learning for channel analysis*

2016-2017  
**Lexmark International Inc,  
Missouri University of Science and Technology, EMC  
Laboratory**

Executor  
*Z Directed Component and Implementation for  
the Reduction of Power Distribution Network  
Ripple*

2014-2017  
**Dell Inc, Cisco Systems, Missouri University of Science  
and Technology, EMC Laboratory**

Team Leader  
*Multi-level Signaling for High Speed Link  
Design*

2014-present  
**USA National Science Foundation I/UCRC EMC Center  
Shared Project, Missouri University of Science and  
Technology, EMC Laboratory**

Executor  
*Development of Software Toolset FEMAS  
(Fast Electromagnetic Analysis Suite) for EMC  
Consortium Member Companies*

2016  
**Shota Rustaveli National Science Foundation, Ilia State  
University**

Co-director  
*Contemporary problems of Electro-Magnetic  
Compatibility and Signal Integrity*

2013  
**Shota Rustaveli National Science Foundation, Tbilisi  
State university**

Executor  
*Development of analytical and numerical  
methods for calculating of cusped prismatic  
shells and beams*

2013  
**Shota Rustaveli National Science Foundation, Tbilisi  
State university**

Executor  
*Generation, intensification and nonlinear self-  
organization of electromagnetic weather-  
forming ULF wave structures in the shear flow  
driven ionosphere*

2011 – 2012  
**INTAS (International Association for the promotion of  
cooperation with scientists from the independent states  
of the former Soviet Union), Tbilisi State University**

Technical assistant  
*Assessment of risk factors of emergency cases  
at oil and gas pipelines and possible pollution  
of environment by means of mathematical  
modeling*

2011-2012

**JTI (Japan Tobacco International), Institute of Geophysics of Tbilisi**

Executor

*Earthquake Model for Middle East Region (EMME), WP5 - The earthquake loss scenario for the city of Tbilisi*

2010

**Presidential Scientific Grants for Young Scientists, Georgian National Science Foundation**

Project manager

*Construction, investigation and numerical resolution of approximate solution schemes for some multidimensional nonlinear problems of mathematical physics using operator split method*

## **MAIN INDUSTRY PROJECTS**

2017 – present

**Web GIS Portal for Cultural Heritage of Georgia**

Consultant

2017 – present

**Web GIS Portal for Ministry of Defense of Georgia**

Consultant

2013

**Development of Concept for GIS Portal for Management of Cultural Heritage Data, Ministry of Culture and Monument Protection of Georgia, Norway**

Key GIS and Database Expert

2011

**Geoinformation Management System for Optical Cable Network and Telephone Networks, JSC Silknet**

Developer of Customized Software based on ArcEngine

2011

**Development of Geodatabase of Real Estate, National Agency of Public Registry**

Manager of Geodatabase Development

2010

**Tbilisi Bypass Railway Construction, Georgian Railway LTD**

Manager of Software and Geodatabase Development

2010

**New Sport-Recreational Site “UDZO”**

GIS Analyst

2009

**Financial Information Management GIS, Ministry of Finance of Georgia**

Manager of Technological Concept Elaboration

2009

**Poti Water Supply Network Management GIS System EBRD, Emerging Market Group LTD**

Software Developer

2008

**Municipal GIS for City of Rustavi Rustavi Municipality**

Project Manager

2008  
**Batumi Land Use Master Plan**  
**Batumi Municipality** Software Developer

2008  
**Geoinformation System for Kvemo Kartli Region** Project Manager

2007  
**Development of Historical-Cultural Master Plan for**  
**Historical Parts of Tbilisi and Batumi,** Software Developer  
**Ministry of Culture and Monuments Protection of**  
**Georgia**

## LANGUAGES

**Georgian** - native, **Russian** – fluent, **English** – fluent

## SKILLS

**Electronic Design Automation Software:** Advanced Design System; CST Microwave Studio; ANSYS HFSS;

**Programming languages and systems:** C/C++, Pascal, Java, C#, VB, ASP.NET, MATLAB;

**Developing tools:** Visual Studio, Qt, CodeGear Rad Studio (C++ Builder, Delphi);

**Databases:** MS Access, SQL Server; Oracle;

**GIS:** ArcGIS Desktop, ArcObject, ArcEngine, ArcGIS Server.

## CERTIFICATES

- Comptia CTT++ Technical Trainer (2012)
- IT Project Management (2012, Caucasus University, Tbilisi, Georgia)
- ArcGIS Desktop Associate (2012)
- Internationally Certified Trainer of ESRI for ArcGIS Desktop and Geodatabase courses (2012)
- Project Management (2011, International Black Sea University, Tbilisi, Georgia)

## AWARDS AND SCHOLARSHIPS

- Best SI/PI Paper, EMC Symposium, Washington DC (2017)
- Stipend of George Soros (1998);
- Winner of the scientific conference "Student Days 99" in Tbilisi State University (1999)
- Winner of the scientific conference "Student Days 2000" in Tbilisi State University (2000)

## MEMBERSHIP

- Institute of Electrical and Electronics Engineers, *Professional association* (2014-present)
- Optimist International – Missouri S&T Optimist Chapter, *founding member* (2016-2017)
- IEEE Women in Engineering (2015-present)
- Georgian Mathematical Union (2010-present)

## OTHER ACTIVITIES

- Reviewer at IEEE EMC Journals and Conferences
- Blogger at [www.mastsavlebeli.ge](http://www.mastsavlebeli.ge) (2015-present)
- Professional Volunteer at Kaleidoscope Discovery Center, Rolla, Mo (2015-2017)
- Robotics Coach at FIRST Lego League (2014-present)
- Supervisor of Parents of Remarkably Talented Youth of Rolla, Mo (2016-2017)
- Advisor of Rolla Middle and Junior High Schools Science and Math Olympiad Teams (2015 - 2017)
- Founder of Arduino Club for Junior High School students at EMC Laboratory

## TRANSLATED BOOKS from English to Georgian

Young Stalin, Simon Sebag Montefiore, Bakur Sulakauri Publishing

Stalin: A New History, edited by Sarah Davies and James Harries, Artanuji Publishing

## PRESENTATIONS AT INTERNATIONAL CONFERENCES

2018, May

**ECTC 2018 IEEE 68th Electronic Components and Technology Conference**

Effect of improved optimization of DFE equalization on crosstalk and jitter in high speed links with multi-level signal, *accepted*

2017, August

**IEEE EMC Symposium, Washington DC**

Improved MMSE Optimization for DFE Equalization

2017, October

**IBIS Summit, International Conference on Electrical Design of Advanced Packaging & Systems EPEPS, San Jose, California**

Equalizations for Multi-level Signals

2017, March

**10th Annual Teaching and Learning Technology (TLT X) Conference, MO, USA**

Teaching STEM to Middle School Students through Robotics and Arduino

2016

**IEEE EMC Symposium, Ottawa, Canada**

PAM4 signaling considerations for High-Speed Serial Links

2016

**The Women in Leadership, Columbia, MO, USA**

H4B Women – lost potential

2015

**International Conference on Electrical Design of Advanced Packaging & Systems EPEPS, San Jose, California**

High-Speed Serial Link Challenges using Multi-Level Signaling

2011

**Reliable Methods of Mathematical Modeling, EPFL, Lausanne, Switzerland**

Construction, investigation and numerical resolution of high order accurate semi-discrete decomposition scheme

2011  
**9th International Conference of Numerical Analysis and Applied Mathematics, Halkidiki, Greece**

Construction and Numerical Realization of Decomposition Scheme for Multidimensional Quasi-Linear Evolution Equation

2010  
**4th International Conference Computational Methods in Applied Mathematics, Bedlewo, Poland**

High degree precision decomposition method for evolution problem

2010  
**International Congress on Computational and Applied Mathematics, KU Leuven, Belgium**

The Third Order of Accuracy Decomposition Scheme for Quasi-linear Evolution Problem

2010  
**First International Conference of Georgian Mathematical Union, Batumi, Georgia**

The Fourth Order of Accuracy Operator Splitting Scheme for Quasi-Linear Evolution Problem

## SCIENTIFIC PAPERS

1. A Chada, B Mutnury, N Dikhaminjia, M Tsiklauri, J Fan, JL Drewniak, Improved Transmitter Jitter Modeling for Accurate Bit Error Rate (BER) Eye Contours Using Transient Simulation of Short Bit Patterns, *IEEE Transactions on Electromagnetic Compatibility*, 2018
2. He J., Dikhaminjia N., Tsiklauri M., Drewniak J., Fan J., Chada A., Mutnury B., Per-bit Equalization Approach for Multi-level Signal in High-speed Design, *Proc. of IEEE International Conference on Electrical Design of Advanced Packaging & Systems*, 2017
3. Maghlakelidze G., Dikhaminjia N., Chavalla S., Drewniak J., Sensitivity of NRZ and PAM4 signaling schemes to Channel Insertion Loss Deviation, *Proc. of IEEE International Conference on Electrical Design of Advanced Packaging & Systems*, 2017
4. Dikhaminjia N., He J., Deng H., Chavalla S., Drewniak J., Fan J., Chada A., Mutnury B., Improved MMSE Optimization for DFE Equalization, *Proceedings of IEEE International Symposium on Electromagnetic Compatibility and Signal Integrity*, 2017, August
5. He J., Dikhaminjia N., Tsiklauri M., Drewniak J., Fan J., Chada A., Mutnury B., Equalization Enhancement Approaches for PAM4 signaling for Next Generation Speeds, *Proceedings of 2017 IEEE 67th Electronic Components and Technology Conference (ECTC)*
6. Zhao B., Chao Y., Dikhaminjia N., Drewniak J., Kratzer Z., Hardin K., Z Directed Component and Implementation for the Reduction of PDN Ripple, *Proceedings of IEEE International Symposium on Electromagnetic Compatibility and Signal Integrity*, 2017, August, **Best SI-PI Paper Award**
7. Tsiklauri M., Dikhaminjia N., Fan J., Drewniak J., S-Parameters Quality Estimation in Physical Units, *Proceedings of IEEE International Symposium on Electromagnetic Compatibility and Signal Integrity*, 2017, August
8. Dikhaminjia N., Rogava J., Tsiklauri M., Operator Splitting for Quasi-Linear Abstract Hyperbolic Equation, *Journal of Mathematical Sciences*, Springer, V. 218, N 6, 2016
9. Tsiklauri M., Zvonkin M., Dikhaminjia N., Fan J., Drewniak J., Discrete Hilbert Transform Based Delay Causality Enforcement for Network Parameters, *Proceedings of IEEE International Symposium on Electromagnetic Compatibility and Signal Integrity*, 2016
10. Dikhaminjia N., He J., Drewniak J., Fan J., Chada A., Mutnury B., Achkir B., PAM4 signaling considerations for High-Speed Serial Links, *Proceedings of IEEE International Symposium on Electromagnetic Compatibility and Signal Integrity*, 2016, pp. 906-910
11. Tsiklauri M., Zvonkin M., Dikhaminjia N., Fan J., Drewniak J., Front delay based causality for network parameters, *2016 Asia-Pacific International Symposium on Electromagnetic Compatibility (APEMC)*, Shenzhen, China, 2016, pp. 870-872

12. Dikhaminjia N., Rogava J., Tsiklauri M., Construction and Numerical Resolution of High Order Accuracy Decomposition Scheme for Multidimensional Quasi-Linear Evolution Equation, *Georgian Mathematical Journal*, 2015
13. Tsiklauri M., Zvonkin M., Dikhaminjia N., Fan J., Drewniak J., Stable Recursive Convolution for Channel Response Calculation with Causality Enforcement, *Proc. of IEEE International Conference on Electrical Design of Advanced Packaging & Systems*, 2015
14. Dikhaminjia N., Rogava J., Tsiklauri M., Zvonkin M., Fan J., Drewniak J., Fast Approximation of Sine and Cosine Hyperbolic Functions for the Calculation of the Transmission Matrix of a Multiconductor Transmission Line. *IEEE Transactions on Electromagnetic Compatibility*, 2015
15. Dikhaminjia N., He J., Hernandez E., Tsiklauri M., Zvonkin M., Drewniak J., Chada A., Mutnury B., High-Speed Serial Link Challenges using Multi-Level Signaling, *Proceedings of Electrical Performance of Electric Packaging and Systems*, 2015
16. Tsiklauri M., Zvonkin M., Dikhaminjia N., Fan J., Drewniak J., Frequency-domain Interpolation of Long Structures for System-level Signal Integrity Analysis, *Proceedings of IEEE International Conference on Signal and Power Integrity*, 2015, p. 335-340
17. Dikhaminjia N., Rogava J., Tsiklauri M. Construction and Investigation of a Fourth Order of Accuracy Decomposition Scheme for Nonhomogeneous Multidimensional Hyperbolic Equation. *Taylor & Francis: Journal of Numerical Functional Analysis and Optimization*, 2014, vol 35, No. 3, pp. 275-293
18. Dikhaminjia N., Rogava J., Tsiklauri M., Convergence of a semi-discrete scheme for an abstract nonlinear second order evolution equation, *Elsevier, Journal of Applied Numerical Mathematics*, 2014
19. Dikhaminjia N., Rogava J., Tsiklauri M. Operator Splitting for Quasi-Linear Abstract Hyperbolic Equation. *Marie Curie's International Research Staff Exchange Scheme (IRSES) in the 7th European Framework Program, Proceedings of the International Conference Lie Groups, Differential Equations and Geometry*, vol. 1, pp. 85-90, 2013
20. Dikhaminjia N., Rogava J., Tsiklauri M. Third Order Decomposition Scheme for Quasi-linear Evolution Equation with Variable Operator, *Reports of Enlarged Session of the Seminar of I. Vekua Institute of Applied Mathematics*, vol. 27, 2013
21. Dikhaminjia N., Rogava J., Tsiklauri M. Construction of High Order Accuracy Decomposition Scheme for an Abstract Hyperbolic Equation with the Lipschitz Continuous Operator on the Basis of Rational Splitting of the Cosine-Operator Function, *AIP Conf. Proc. Numerical Analysis and Applied Mathematics ICNAAM 2011*, vol. 1389, 2011
22. Dikhaminjia N., Rogava J., Tsiklauri M. The Third Order of Accuracy Sequential Type Operator Splitting Scheme for Quasi-linear Multidimensional Evolution Problem. *Abstracts book of International Congress on Computational and Applied Mathematics, Belgium*, 2010
23. Dikhaminjia N., Rogava J., Tsiklauri M. The Third Order of Accuracy Decomposition Scheme for Quasi-linear Evolution Problem. *Computational Methods in Applied Mathematics, Abstracts of the International Conference CMAM-4, Bedlewo, Poland*, 2010
24. Davitashvili T., Samkharadze I., Gunava G., Geladze G., Dikhaminjia N. On One 3d Numerical Model of Harmful Substances Transfer with Account of Composite Orography. *Reports of Enlarged Session of the Seminar of I. Vekua Institute of Applied Mathematics*, 2006-2007, Vol. 21, pp.16-20
25. Davitashvili T., Geladze G., Dikhaminjia N. *Mathematical Modelling of Soil Pollution by Oil for Urban Conditions. Reports of Enlarged Session of the Seminar of I. Vekua Institute of Applied Mathematics*, 2006-2007, Volume 21, pp.21-25
26. Davitashvili T., Gunava G., Geladze G., Dikhaminjia N. On One Numerical 3d Model Of Soil Pollution By Oil Under High Pressure. *Reports of Enlarged Session of the Seminar of I. Vekua Institute of Applied Mathematics*, 2006-2007, Volume 21, pp. 26-29
27. Davitashvili T., Dikhaminjia N., Gunava G., Komurjishvili O. Pollutants transfer in environment with one new three-dimensional numerical scheme. *Seminar of I. Vekua Institute of Applied Mathematics REPORTS*, 2002, Volume, 28, pp. 25-30