Curriculum Vitae

Anton MENSHOV

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Education

Sep 2014– Aug 2017	Graduate studies in Electrical and Computer Engineering, The University of Texas at Austin, USA. Research focus: "*Fast direct layered-medium integral equation methods for full-wave electromagnetic analysis of electronic packages*". Supervisor: Dr. Ali Yilmaz.
Sep 2011– May 2014	**M.Sc.** in Electrical and Computer Engineering, University of Manitoba, Winnipeg, Canada. Thesis: "*Novel single-source surface integral equations for scattering on 2-D penetrable cylinders and current flow modeling in 2-D and 3-D conductors*". Supervisor: Dr. Vladimir Okhmatovski.
Aug 2005– July 2010	**B.Sc.** (equivalent) in Engineering, majoring in "Management and informatics in technical systems", Moscow State Institute of Electronic Engineering (Technical University), Moscow, Russia. Supervisor: Dr. Vasiliy Demkin.
June 2005	Graduate of Kovrov Gymnasium №1 with honors.

Work Experience

Sep 2017– present	*Research & Development Engineer at CEMWorks, Inc, Winnipeg, Canada* Development of a commercial fast integral-equation based solver for electromagnetic modeling and signal integrity analysis (C++, Python, MPI/OpenMP).
Sep 2014– Aug 2017	*Research Assistant at The University of Texas at Austin, USA* Research on the fast direct free-space and layered-medium integral-equation solvers in computational electromagnetics (C++/Fortran, MPI/OpenMP) working on the large-scale shared/distributed systems (TACC Stampede, #8 supercomputer in TOP500, June2015).

Nov 2013–Feb 2014 *Intern at the Department of System Planning, Manitoba Hydro, Winnipeg, Canada.*
Development and benchmark of the novel Method of Moments prototype for the boundary element method for resistance and inductance extraction in 2-D power cables.

Aug 2011–June 2014 *Research Assistant at University of Manitoba, Winnipeg, Canada.*
Research on the novel integral equation formulations for scattering and current flow modeling, development of the Method of Moments prototypes (C++, Mathcad, OpenMP), electromagnetic simulations on supercomputers (WestGrid).
Research on the microwave imaging, Green's function in multilayered media, and fast direct solvers for electromagnetics.

Aug 2008–Nov 2010 *Financial analyst of the Department of Analytics and Methodology, MDM Bank, Moscow, Russia.*
Development of the system of automatic management and reporting (C++, SQL, VBA), forecasts (neural networks, data envelopment analysis), operation and improvement of decision-making support systems, managerial financials preparation.

Mar 2007–Aug 2008 *Affiliate Manager, "Parallels, Inc.", Moscow, Russia.*
Sales and performance stats analysis and forecasts, supplementary software development, management of affiliate programs, online sales and marketing.

Dec 2005–Nov 2006 *Engineer, Central Science Research Telecommunication Institute.*
Certification of telecommunication hardware (Acterna, Lucent, Nortel, Iskratel, Ericsson), IPTV-systems implementation, system administration, methodology and technical documentation.

Teaching Experience

Sep 2015–Jan. 2016 *Teaching Assistant at The University of Texas at Austin, USA.*
EE 383L "Electromagnetic Field Theory", Fall 2015 (graduate course).

Sep 2012–May 2014 *Teaching Assistant at University of Manitoba, Winnipeg, Canada.*
ECE 3580 "Foundations of Electromagnetics", Fall 2012, Fall 2013.
ECE 7440 "Wavefield Imaging and Inversion in Electromagnetics and Acoustics", Winter 2014 (graduate course).

Sep 2011–Apr 2014 *Teaching Assistant at International College of Manitoba, Canada.*
MATH 1210 "Techniques of Classical and Linear Algebra", Fall 2011, Winter 2012, Fall 2013, Winter 2014.

MATH 1300 “Vector Geometry and Linear Algebra”, Winter 2012, Summer 2012, Fall 2012, Winter 2013, Summer 2013, Fall 2013.

MATH 1500 “Introduction to Calculus”, Fall 2012, Winter 2013, Winter 2014.

MATH 1700 “Calculus II”, Winter 2013.

Publications

- 4 published journal papers and 3 submitted.
- 12 extended papers in conference proceedings
- 17 conference abstracts

Journal Papers

1. **A. Menshov** and V. Okhmatovski, “New single-source surface integral equations for scattering on penetrable cylinders and current flow modeling in 2-D conductors,” *IEEE Trans. Microw. Theory Techn.*, vol. 61, no. 1, pp. 341–350, Jan. 2013.
2. **A. Menshov** and V. Okhmatovski, “Surface-volume-surface electric field integral equation for magneto-quasi-static analysis of complex 3-D interconnects,” IEEE Trans. Microw. Theory Techn., vol. 62, no. 11, pp. 2563–2573, Nov. 2014.
3. S. Zheng, **A. Menshov**, and V. Okhmatovski, “Novel single-source integral equation for inductance extraction in transmission lines embedded in lossy layered substrates,” *IEEE Trans. Microw. Theory Techn.*, vol. 64, no. 12, pp. 4341–4351, Dec. 2016.
4. F. Sheikh Hosseini Lori, **A. Menshov**, and V. Okhmatovski, “New vector single-source surface integral equation for scattering problems on dielectric objects in 2D,” *IEEE Trans. Antennas Propag.*, vol. 65, no. 7, pp. 3794–3799, Jul. 2017.
5. **A. Menshov** and V. Okhmatovski, “Contrast source inversion method of microwave tomography in focusing media,” submitted to *IEEE Antennas Propag. Mag.*
6. F. Sheikh Hosseini Lori, **A. Menshov**, R. Gholami, J. B. Mojolagbe, and V. Okhmatovski, “Novel single-source surface integral equation for scattering problems by 3-D dielectric objects,” submitted to *IEEE Trans. Antennas Propag.*
7. F. Sheikh Hosseini Lori, M. S. Hosen, **A. Menshov**, M. Shafieipour, and V. Okhmatovski, “New high-order method of moments for accurate inductance extraction in transmission lines of complex cross-sections,” submitted to *IEEE Trans. Microw. Theory Techn*.

Extended Papers in Conference Proceedings

1. **A. Menshov** and V. Okhmatovski, “Method of moment solution of Surface-Volume-Surface Electric Field Integral Equation for two-dimensional transmission lines of complex cross-sections,” in *IEEE 16th Work. Signal and Power Integr. (SPI)*, Sorrento, Italy, May 2012, pp. 31–34.
2. **A. Menshov** and V. Okhmatovski, “Novel surface integral equation formulation for accurate broadband RL extraction in transmission lines of arbitrary cross-section,” in *IEEE/MTT-S Int. Microw. Symp.,* Montreal, Canada, Jun. 2012, pp. 1–3.
3. **A. Menshov** and V. Okhmatovski, “Novel single-source surface integral equation for broadband RL extraction in 3-D interconnects,” in *IEEE 17th Work. Signal and Power Integr. (SPI)*, Paris, France, May 2013, pp. 1–2.

4. **A. Menshov**, V. Okhmatovski, H. M. J. S. P. De Silva, K. K. M. A. Kariyawasam, and J. E. Nordstrom, "Modeling of arbitrary shaped cables using novel single source integral equation formulation," in *Int. Conf. Power Syst. Transients*, Catvat, Croatia, Jun. 2015, pp. 1–6.
5. **A. Menshov** and V. Okhmatovski, "Microwave imaging with contrast source inversion method in focusing media," in *IEEE MTT-S Int. Conf. Numer. Electromagn. Multiphysics Model. Optim.*, Ottawa, Canada, Aug. 2015, pp. 1–3.
6. S. Zheng, **A. Menshov**, and V. Okhmatovski, "Novel single-source integral equation for inductance extraction in transmission lines embedded in lossy layered substrates," in *IEEE/MTT-S Int. Microw. Symp.*, San Francisco, CA, May 2016, pp. 1–3.
7. V. Okhmatovski, **A. Menshov**, F. Sheikh Hosseini Lori, and S. Zheng, "Novel single-source integral equation in electromagnetics," in *URSI Int. Symp. Electromagn. Theory (EMTS)*, Espoo, Finland, Aug. 2016, pp. 1–4.
8. C. Liu, **A. Menshov**, V. Subramanian, K. Augun, H. Braunisch, V. Okhmatovski, and A. Yilmaz, "Toward predictive modeling of full-size packages with layered-medium integral-equation methods," in *Electr. Perf. Electron. Packag. Syst.*, San Diego, CA, Oct. 2016, pp. 1–3.
9. **A. Menshov**, Y. Brick, C.-T. Verdin, and A. Yilmaz, "Recent progress in rigorous algorithms for the fast solution of 3-D EM frequency-domain integral-equations," in *6th Int. Symp. 3-D Electromagn.*, Berkeley, CA, Mar. 2017, pp. 1–4.
10. F. Sheikh Hosseini Lori, M. S. Hossen, M. Shafieipour, **A. Menshov**, and V. Okhmatovski, "Accurate characterization of coaxial transmission line via higher order moment method solution of novel single-source surface integral equation," in *IEEE 21st Work. Signal and Power Integr. (SPI)*, Lake Maggiore, Italy, May 2017, pp. 1–4.
11. F. Sheikh Hosseini Lori, M. S. Hossen, **A. Menshov**, M. Shafieipour, and V. Okhmatovski, "Accurate transmission lines characterization via higher order moment method solution of novel single-source integral equation," in *IEEE/MTT-S Int. Microw. Symp.*, Honolulu, HI, Jun. 2017, pp. 694–696.
12. M. Shafieipour, H. M. J. S. P. De Silva, K. K. M. A. Kariyawasam, **A. Menshov**, and V. Okhmatovski, "Fast computation of the electrical parameters of sector-shaped cables using single-source integral equation and 2D moment method discretization," in *Int. Conf. Power Syst. Transients*, Seoul, South Korea, Jun. 2017, pp. 1–6.

Conference Abstracts

1. **A. Menshov** and V. Okhmatovski, "Novel single-source integral equation for accurate quasi-magneto-static modeling of current flow in 3D conductors," in *USNC-URSI Rad. Sci. Meet.*, Memphis, TN, Jul. 2013, p. 110.
2. **A. Menshov** and V. Okhmatovski, "Fast extraction of resistance and inductance in complex 3D interconnects using surface-volume-surface electric field integral equation," in *USNC-URSI Rad. Sci. Meet.*, Orlando, FL, Jul. 2014, p. 179.
3. **A. Menshov** and V. Okhmatovski, "Well-posed microwave imaging in focusing media: 2D generalization and impact on convergence of the contrast source inversion method," in *USNC-URSI Rad. Sci. Meet.*, Orlando, FL, Jul. 2014, p. 207.
4. **A. Menshov**, K. Yang, V. Okhmatovski, and A. Yilmaz, "An *H*-matrix accelerated direct solver for fast analysis of scattering from structures in layered media," in *USNC-URSI Rad. Sci. Meet.*, Vancouver, Canada, Jul. 2015, p. 142.
5. F. Sheikh Hosseini Lori, **A. Menshov**, and V. Okhmatovski, "Method of moment solution of surface-volume-surface electric field integral equation for 2D TM and TE scattering on a penetrable cylinders of arbitrary cross-section," in *USNC-URSI Rad. Sci. Meet.*, Vancouver, Canada, Jul. 2015.

6. J. W. Massey, **A. Menshov**, and A. Yilmaz, "An empirical methodology for judging the performance of parallel algorithms on heterogeneous clusters," in *Int. Work. Finite Elem. Microw. Eng.*, Florence, Italy, May 2016.
7. F. Sheikh Hosseini Lori, **A. Menshov**, and V. Okhmatovski, "Novel surface-volume-surface electrical field integral equation for solution of scattering problems on penetrable objects," in *Int. Work. Finite Elem. Microw. Eng.*, Florence, Italy, May 2016.
8. F. Sheikh Hosseini Lori, **A. Menshov**, R. Gholami, and V. Okhmatovski, "Novel single-source integral equation for scattering problems on homogeneous dielectric objects," in *USNC-URSI Rad. Sci. Meet.*, Fajardo, Puerto-Rico, Jun. 2016.
9. V. Okhmatovski, C. Liu, **A. Menshov**, and A. Yilmaz, "A multiplicative Calderon preconditioner for the impedance boundary condition electric field integral equation," in *USNC-URSI Rad. Sci. Meet.*, Fajardo, Puerto-Rico, Jun. 2016.
10. **A. Menshov**, Y. Brick, and A. Yilmaz, "A fast direct integral-equation solver for hydraulic fracture diagnosis," in *USNC-URSI Rad. Sci. Meet.*, Fajardo, Puerto-Rico, Jun. 2016, pp. 51–52.
11. J. W. Massey, **A. Menshov**, and A. Yilmaz, "Toward next-generation benchmarking of CEM methods: comparing computational costs," in *USNC-URSI Nat. Radio Sci. Meet.*, Boulder, CO, Jan. 2017, p. 1.
12. V. Okhmatovski, F. Sheikh Hosseini Lori, S. Zheng, **A. Menshov**, and S. M. Hossen, "New single-source integral equations for solutions of scattering problems," in *Progress Electromagn. Res. Symp. (PIERS).*, St Petersburg, Russia, May 2017.
13. **A. Menshov** and V. Okhmatovski, "Microwave imaging with contrast source inversion method in the presence of focusing media," in *Progress Electromagn. Res. Symp. (PIERS).*, St Petersburg, Russia, May 2017.
14. F. Sheikh Hosseini Lori, M. S. Hossen, **A. Menshov**, and V. Okhmatovski, "Solution of scattering problems on penetrable objects with higher order method of moments discretization of surface-volume-surface electric field integral equation," in *USNC-URSI Radio Sci. Meet.*, San-Diego, CA, Jul. 2017.
15. R. Gholami, J. Mojolagbe, **A. Menshov**, F. Sheikh Hosseini Lori, and V. Okhmatovski, "An *H*-matrix accelerated solution of a new single-source integral equation for scattering on penetrable objects," in *USNC-URSI Radio Sci. Meet.*, San-Diego, CA, Jul. 2017.
16. J. W. Massey, **A. Menshov**, and A. Yilmaz, "An element-diagonal preconditioner for the volume electric-field integral equation," in *USNC-URSI. Radio Sci. Meet.*, Boulder, CO, San-Diego, CA, Jul. 2017.
17. **A. Menshov**, V. Okhmatovski, and A. E. Yilmaz, "A modified admissibility criterion for *H*-matrix based integral-equation," in *USNC-URSI Radio Sci. Meet.*, San-Diego, CA, Jul. 2017, pp. 27–28.

Invited Talks

- IEEE Waves Chapter Winnipeg Seminar, "*New Single-Source Surface Integral Equations for Scattering on Penetrable Cylinders and Current Flow Modeling in Two-Dimensional Conductors,*" Winnipeg, Canada, Nov. 2, 2012.
- Workshop for teaching assistants in mathematics in International College of Manitoba, Winnipeg, Canada, May 14, 2013 and Sep. 17, 2013.

Awards in the National Competitions

- 2005, Moscow Mathematical Contest Among School Students, 3rd prize.

- 2003, Open contest among scientific works of students in Russian post-secondary educational institutions, 1st prize.

Academic Honors and Awards

- 2015, International Union of Radio Science (URSI) Travel Fellowship Grant Award.
- 2013, Mitacs-Accelerate grant (joint with Manitoba Hydro as an industry partner).
- 2013, University of Manitoba Graduate Student Association Conference Grant Award.
- 2012, University of Manitoba Graduate Student Travel Award.
- 2011, University of Manitoba International Graduate Student Entrance Scholarship.
- 2005–2010, Russian National Scholarship for Excellence in Studies.

Professional Activity

- 2017–present, Reviewer of The Applied Computational Electromagnetics Society.
- 2017–present, Student Member of The Applied Computational Electromagnetics Society (ACES).
- 2017–present, Reviewer of IEEE Transactions on Microwave Theory and Techniques.
- 2012–present, Student Member of Institute of Electrical and Electronics Engineers (IEEE), member of IEEE Antennas and Propagation Society, and Microwave Theory and Techniques Society.
- 2012–present, Student Member of Society for Industrial and Applied Mathematics
- 2012–2013, Member of the Graduate Students' Association Awards Committee, University of Manitoba.

Fields of Interest

- Computational Electromagnetics.
- Fast Algorithms.
- Matrix Analysis and Linear Algebra.