Priv. Doz. Dr. Leonidas Mindrinos

Personal Data

Date and Place of Birth:	04/06/1982, Athens, Greece
Citizenship:	Greek
Address:	Department of Mathematics School of Applied Mathematical and Physical Sciences National Technical University of Athens Heroon Polytechneiou 9 (Building E) 15780 Zografou, Greece
Cell:	+ 30 6944677059
Website:	leonidasmindrinos.github.io
Email:	leomid@central.ntua.gr

Education

11/2018 **Habilitation in Mathematics**, University of Vienna, Austria.
Faculty of Mathematics
Thesis Title: "Integral Equation Methods for Obstacle Scattering and Quantitative Multi-modal Imaging Problems"

07/2011 **Ph.D. in Applied Mathematics**, National Technical University of Athens, Athens, Greece.
School of Applied Mathematical and Physical Sciences
Thesis Title: "The Inverse Problem of finding the shape of Cavities and Inclusions in Static and Dynamic Linear Elasticity" URL: http://dspace.lib.ntua.gr/handle/123456789/4975 (in greek)
Supervisor: Prof. Drossos Gintides
Area of Study: Partial Differential Equations

06/2007 **M.Sc. in Applied Mathematics**, National Technical University of Athens, Athens, Greece.
Coordinated by: School of Applied Mathematical and Physical Sciences
Interdepartmental Master's Program: Applied Mathematical Sciences
Thesis Title: "Regularization methods for Inverse Problems"
Master's Degree Grade: 8,6/10

02/2006 **B.Sc. in Mathematics**, National and Kapodistrian University of Athens, Athens, Greece.
Department of Mathematics

Working Experience

03/2022 – ...	**Research Scientist**, Department of Mathematics, School of Applied Mathematical and Physical Sciences, National Technical University of Athens, Greece.
09/2019 – 02/2022	**Scientific Coordinator** of the SFB project "Tomography across the Scales", Faculty of Mathematics, University of Vienna, Austria.
09/2018 – 08/2019	**Research Scientist**, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences, Austria.
03/2013 – 08/2018	**Assistant Professor**, Computational Science Center, University of Vienna, Austria.
09/2012 – 02/2013	**Research Assistant (PostDoc)**, Computational Science Center, University of Vienna, Austria.

Professional Affiliations and Memberships

2014 – 2018	Member of the Council of the European Consortium for Mathematics in Industry (ECMI).
	Member of the Hellenic Mathematical Society (HMS).

Teaching Experience

National Technical University of Athens, Greece

2022	"Software for Mathematics, Physics and their Teaching", undergraduate course, Summer Semester, School of Applied Mathematical and Physical Sciences. "Partial Differential Equations II", undergraduate course, Summer Semester, School of Applied Mathematical and Physical Sciences.

University of Vienna, Austria

2017 – 2018	"Numerical Methods III – Optimization", graduate course, Summer Semester, Faculty of Physics. "Numerical Methods IV – Partial Differential Equations", graduate course, Summer Semester, Faculty of Physics. "Inverse Problems", graduate course, Summer Semester, Department of Meteorology and Geophysics. "Numerical Methods I – Exercises", graduate course, Winter Semester, Faculty of Physics.

2016 – 2017 "Numerical Methods III – Optimization", graduate course, Summer Semester, Faculty of Physics.
"Numerical Methods IV – Partial Differential Equations", graduate course, Summer Semester, Faculty of Physics.
"Inverse Problems", graduate course, Summer Semester, Department of Meteorology and Geophysics.

2015 – 2016 "Numerical Methods III – Optimization", graduate course, Summer Semester, Faculty of Physics.
"Numerical Methods IV – Partial Differential Equations", graduate course, Summer Semester, Faculty of Physics.
"Inverse Problems", graduate course, Summer Semester, Department of Meteorology and Geophysics.
"Numerical Methods I/II", graduate course, Winter Semester, Faculty of Physics.
"Numerical Methods I/II – Exercises", graduate course, Winter Semester, Faculty of Physics.

2014 – 2015 "Continuous Optimization", graduate course, Summer Semester, Faculty of Computer Science.
"Inverse Problems", graduate course, Summer Semester, Faculty of Mathematics.
"Discrete Optimization", graduate course, Winter Semester, Faculty of Computer Science.
"Numerical Methods I/II – Exercises", graduate course, Winter Semester, Faculty of Physics.

2013 – 2014 "Optimization in Function Spaces", graduate course, Summer Semester, Department of Mathematics.
"Continuous Optimization", graduate course, Summer Semester, Faculty of Computer Science.
"Discrete Optimization", graduate course, Winter Semester, Faculty of Computer Science.
"Numerical Methods I/II – Exercises", graduate course, Winter Semester, Faculty of Physics.

2012 – 2013 "Tutorial on Numerical Mathematics", undergraduate course, Summer Semester, Faculty of Mathematics.

Research Interests

Partial Differential Equations and Integral Equations.

Mathematical Modeling.

Direct and Inverse Scattering Problems.

Acoustic, Elastic and Electromagnetic Wave Propagation.

Medical Imaging, Tomography.

Research Projects

[1] Austrian Science Fund (FWF), Faculty of Mathematics, University of Vienna, 2019 – 2022
Project title: "SFB: Tomography across the scales"
Role: Scientific Coordinator
Project Manager: O. Scherzer

[2] Österreichische Austauschdienst GmbH (OeAD-GmbH), Computational Science Center, University of Vienna, 2014.
Project title: "WTZ-Programm Amadée (Austria - France)"
Role: Research Scientist (PostDoc)
Project Manager of the Austrian part: O. Scherzer

[3] Austrian Science Fund (FWF), Computational Science Center, University of Vienna, 2012– 2013.
Project title: "Photoacoustic Imaging in Biology and Medicine"
Role: Research Scientist (PostDoc)
Project Manager: O. Scherzer

[4] Basic Research Support Project (PEVE 2010), National Technical University of Athens (NTUA), 2010–2011.
Project title: "Inverse problems in linear elasticity using indicator functions methods"
Role: Research Scientist (PhD student)
Scientific Responsible: D. Gintides

[5] Basic Research Support Project (PEVE 2007), National Technical University of Athens (NTUA), 2007–2009.
Project title: "New methods for solving inverse problems"
Role: Research Scientist (PhD student)
Scientific Responsible: D. Gintides

[6] Greek-German Cooperation Project (IKYDA 2005), State Scholarships Foundation (IKY) - German Academic Exchange Service (DAAD), 2006.
Project title: "The factorization method for detecting objects in acoustic waveguides and elastic mediums"
Role: Research Scientist (PhD student)
Project Manager of the Greek Research Team: K. Kiriaki

Referee for international journals

Elsevier Applied Numerical Mathematics, IOP Inverse Problems, RMMC Journal of Integral Equations and Applications, SIAM Journal on Imaging Sciences

(SIIMS), Springer Journal of Mathematical Imaging and Vision, Springer Numerische Mathematik, SPIE Journal of Biomedical Optics, IMA Journal of Applied Mathematics.

Book chapters

[1] P. Elbau, L. Mindrinos, and L. Veselka. "Quantitative OCT reconstructions for dispersive media". *Time-dependent Problems in Imaging and Parameter Identification*. Edited by B. Kaltenbacher, T. Schuster, and A. Wald. Springer, Cham, 2021, pages 229–266. DOI: https://doi.org/10.1007/978-3-030-57784-1_8.

[2] P. Elbau, L. Mindrinos, and O. Scherzer. "Mathematical Methods of Optical Coherence Tomography". *Handbook of Mathematical Methods in Imaging*. Edited by O. Scherzer. Springer New York, 2015, pages 1169–1204. DOI: 10.1007/978-1-4939-0790-8_44.

Publications

[1] R. Chapko and L. Mindrinos. "On the numerical solution of a hyperbolic inverse boundary value problem in bounded domains". *Mathematics* 10.5 (2022), page 750. DOI: 10.3390/math10050750.

[2] L. Veselka, L. Krainz, L. Mindrinos, W. Drexler, and P. Elbau. "A Quantitative Model for Optical Coherence Tomography". *Sens.* 21.20 (2021), page 6864. DOI: 10.3390/s21206864.

[3] R. Chapko, B. T. Johansson, and L. Mindrinos. "On a boundary integral solution of a lateral planar Cauchy problem in elastodynamics". *J Comp. Appl. Math.* 367 (2020), page 112463. DOI: 10.1016/j.cam.2019.112463.

[4] D. Gintides, S. Giogiakas, and L. Mindrinos. "The direct electromagnetic scattering problem by a piecewise constant inhomogeneous cylinder at oblique incidence". Preprint on ArXiv arXiv:2004.14082. 2020. URL: https://arxiv.org/abs/2004.14082.

[5] A. Kittenberger, L. Mindrinos, and O. Scherzer. "Computed Origami Tomography". *SIAM Review (to appear)* arXiv:2006.03446 (2020). URL: https://arxiv.org/abs/2006.03446.

[6] R. Chapko and L. Mindrinos. "On the Non-Linear Integral Equation Approach for an Inverse Boundary Value Problem for the Heat Equation". *J. Eng. Math.* 119.1 (2019), pages 255–268. DOI: 10.1007/s10665-019-10028-4.

[7] D. Gintides and L. Mindrinos. "The inverse electromagnetic scattering problem by a penetrable cylinder at oblique incidence". *Appl. Anal.* 98.4 (2019), pages 781–798. DOI: 10.1080/00036811.2017.1402891.

[8] L. Mindrinos. "The electromagnetic scattering problem by a cylindrical doubly connected domain at oblique incidence: the direct problem". *IMA J. Appl. Math.* 84.2 (2019), pages 292–311. DOI: 10.1093/imamat/hxy059.

[9] R. Chapko, D. Gintides, and L. Mindrinos. "The inverse scattering problem by an elastic inclusion". *Adv. Comput. Math.* 44.2 (2018), pages 453–476. DOI: 10.1007/s10444-017-9550-z.

[10] R. Chapko and L. Mindrinos. "On the numerical solution of the exterior elastodynamic problem by a boundary integral equation method". *J. Integral Equations Appl.* 30.4 (2018), pages 521–542. DOI: 10.1216/JIE-2018-30-4-521.

[11] P. Elbau, L. Mindrinos, and O. Scherzer. "Quantitative reconstructions in multimodal photoacoustic and optical coherence tomography imaging". *Inverse Probl.* 34.1 (2018), page 014006. DOI: 10.1088/1361-6420/aa9ae7.

[12] P. Elbau, L. Mindrinos, and O. Scherzer. "The inverse scattering problem for orthotropic media in polarization-sensitive optical coherence tomography". *GEM. Int. J. Geomath.* 9.1 (2018), pages 145–165. DOI: 10.1007/s13137-017-0102-y.

[13] H. Akhouayri, M. Bergounioux, A. Da Silva, P. Elbau, A. Litman, and L. Mindrinos. "Quantitative thermoacoustic tomography with microwaves sources". *J. Inverse Ill-Posed Probl.* 25.6 (2017), pages 703–717. DOI: 10.1515/jiip-2016-0012.

[14] P. Elbau, L. Mindrinos, and O. Scherzer. "Inverse problems of combined photoacoustic and optical coherence tomography". *Math. Methods Appl. Sci.* 40.3 (2017), pages 505–522. DOI: 10.1002/mma.3915.

[15] D. Gintides and L. Mindrinos. "The direct scattering problem of obliquely incident electromagnetic waves by a penetrable homogeneous cylinder". *J. Integral Equations Appl.* 28.1 (2016), pages 91–122. DOI: 10.1216/JIE-2016-28-1-91.

[16] D. Gintides and L. Midrinos. "Inverse scattering problem for a rigid scatterer or a cavity in elastodynamics". *ZAMM Z. Angew. Math. Mech.* 91.4 (2011), pages 276–287. DOI: 10.1002/zamm.201000098.

Conference Publications

[1] P. Elbau, L. Mindrinos, and L. Veselka. "Reconstructing the Optical Parameters of a Layered Medium with Optical Coherence Elastography". *Mathematical and Numerical Approaches for Multi-Wave Inverse Problems*. Edited by L. Beilina, M. Bergounioux, M. Christofol, A. Da Silva, and A. Litman. Volume 328. Springer Proceedings in Mathematics & Statistics. Springer, 2020, pages 105–126. DOI: https://doi.org/10.1007/978-3-030-48634-1_8.

[2] R. Chapko and L. Mindrinos. "On the numerical solution of the elastodynamic problem by a combination of the laguere transformation and the boundary integral equation method". *Proceedings of the International Ukrainian Conference on Applied Mathematics (UCAM 2017)*. Ivan Franko National University of Lviv, 2018, pages 29–31. ISBN: 978-617-7065-76-9. URL: http://ami.lnu.edu.ua/ucam/docs/conf2017_final.pdf.

[3] P. Elbau, L. Mindrinos, and O. Scherzer. "Modeling polarization-sensitive OCT using inverse scattering techniques". *Imaging and Applied Optics 2017*. Optical Society of America, 2017, MW3C.3. DOI: 10.1364/MATH.2017.MW3C.3.

[4] P. Elbau, L. Mindrinos, and O. Scherzer. "The inverse electromagnetic scattering problem in OCT for anisotropic media". *Oberwolfach Conference: Theory and Numerics of Inverse Scattering Problems*. Volume 13. Oberwolfach reports. EMS Publishing House, 2016, pages 2612–2615. DOI: 10.4171/OWR/2016/45.

[5] P. Elbau, L. Mindrinos, and O. Scherzer. "The Inverse Scattering Problem in Optical Coherence Tomography". *Imaging and Applied Optics 2016*. Optical Society of America, 2016, MW5H.6. DOI: 10.1364/MATH.2016.MW5H.6.

[6] P. Elbau, L. Mindrinos, and O. Scherzer. "Mathematical Modeling of Optical Coherence Tomography". *Oberwolfach Conference: Mathematics and Algorithms in Tomography*. Mathematisches Forschungsinstitut Oberwolfach, 2014, pages 2053–2054. DOI: 10.4171/OWR/2014/37.

[7] D. Gintides and L. Mindrinos. "The detection of an inclusion in 2-D linear elasticity using non-linear integral equations". *Proceedings of the 2nd International Conference on Inverse Problems in Mechanics of Structures and Materials*. 2011, pages 27–28.

[8] D. Gintides and L. Mindrinos. "The inverse scattering problem in linear elasticity for few incident waves using nonlinear integral equations". *Proceedings Book of the Fifth International Conference on Inverse Problems, Control and Shape Optimization*. 2010, pages 167–173.

[9] D. Gintides and L. Mindrinos. "The inverse scattering problem in linear elasticity via a pair of non linear integral equations". *Advanced Topics in Scattering and Biomedical Engineering*. World Scientific, 2010, pages 12–19. DOI: 10.1142/9789814322034_0002.

[10] D. Gintides, K. Kiriaki, A. Lygidaki, and L. Mindrinos. "The detection of point scatterers in a waveguide". *Advanced Topics in Scattering and Biomedical Engineering*. World Scientific, 2008, pages 38–46. DOI: 10.1142/9789812814852_0005.

Other Publications

[1] L. Mindrinos. "Photoacoustic Imaging in Biology and Medicine". *ECMI Newsletter 56*. ECMI, 2014, pages 92–94.

Invited Talks

[1] A two-step method for the numerical solution of lateral Cauchy problems, Joint Fudan-RICAM Seminar on Inverse Problems (virtual), Shanghai, China 2021.

[2] Refractive index reconstructions in coupled physics imaging, IS20: SIAM Conference on Imaging Science (virtual), Toronto, Canada 2020.

[3] An iterative method for solving numerically the exterior elastodynamic problem in planar unbounded domains, Applied Inverse Problems Conference (AIP), Grenoble, France 2019.

[4] A two-parameter reconstruction in PAT/OCT imaging, Applied Inverse Problems Conference (AIP), Grenoble, France 2019.

[5] Reconstructing the optical properties of a medium from the coupled physics PAT/OCT system, Joint Mathematics Meetings - SIAM Minisymposium, Baltimore, USA 2019.

[6] Quantitative OCT: Back to basics, 2nd SFB Workshop, Obergurgl, Austria 2018.

[7] A reconstruction method for multi-modal imaging, SIAM Conference on Imaging Science, Bologna, Italy 2018.

[8] The electromagnetic scattering problem by an infinitely long cylinder at oblique incidence, Inverse Problems: Modeling and Simulation (IPMS), Mellieha, Malta 2018.

[9] Anisotropic scattering in Polarized-sensitive OCT, SFB Tomography across the Scales, Obergurgl, Austria 2018.

[10] The inverse scattering problem in quantitative Polarized-sensitive OCT, Equadiff 2017, Bratislava, Slovakia 2017.

[11] Quantitative Polarized - sensitive Optical Coherence Tomography for orthotropic media, The 9th Applied Inverse Problems Conference (AIP), Hangzhou, China 2017.

[12] The scattering problem of obliquely incident electromagnetic waves, Workshop Inverse Problems in the ALPS, Obergurgl, Austria 2016.

[13] Inverse Problems of Quantitative Coupled Physics Imaging techniques, ULTRASONIC 2016 New trends in Hybrid Ultrasonic Imaging, Orléans, France 2016.

[14] The direct electromagnetic scattering problem by an infinitely long dielectric cylinder, Department of Mathematics, National Technical University of Athens, Athens, Greece 2016.

[15] Reconstruction of the optical properties of a dielectric medium from combined PAT-OCT measurements, 27th IFIP TC7 Conference 2015 on System Modelling and Optimization, Sophia Antipolis, France 2015.

[16] Reconstruction Model for Determining Optical Properties of a Sample in Optical Coherence Tomography, AIPC 2013: Applied Inverse Problem Conference, Daejeon, Korea 2013.

[17] A mathematical model based on Maxwell's equations in OCT, AKH: Center for Medical Physics and Biomedical Engineering, Vienna, Austria 2013.

[18] Solving the Inverse Scattering Problem in Linear Elasticity using non - linear Integral Equations, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria 2012.

Conference Announcements

[1] The ill-posed lateral Cauchy problem in elastodynamics, Workshop on Numerical Methods for Optimal Control and Inverse Problems, Munich, Germany, 2019.

[2] Modeling polarization-sensitive OCT using inverse scattering techniques, Imaging and Applied Optics 2017, San Francisco, USA 2017.

[3] Modeling OCT as an Inverse Scattering Problem (poster), 100 Years of the Radon Transform, Linz, Austria 2017.

[4] The inverse scattering problem in quantitative multi-modal tomography, Inverse Problems in Wave Propagation - IWaP 2015, Bremen, Germany 2015.

[5] An Iterative Reconstruction Formula for Optical Coherence Tomography, ECMI 2014: The 18th European Conference on Mathematics for Industry, Taormina, Italy 2014.

[6] Inverse Scattering in Optical Coherence Tomography, Workshop: Photoacoustic Imaging in Biology and Medicine, Obergurgl, Austria 2014.

[7] Mathematical models for Optical Coherence Tomography (OCT) and connection to Ultrasound Tomography, Workshop: Photoacoustic Imaging in Biology and Medicine, Obergurgl, Austria 2013.

[8] The detection of an inclusion in 2-D linear elasticity using non-linear integral equations, IPM 2011 - International Conference on Inverse Problems in Mechanics of Structure and Materials, Rzeszów, Poland 2011.

[9] On the numerical solution of nonlinear integral equations in elastodynamics, Dynamics in Samos - Workshop on Differential Equations, Dynamical Systems and Applications, Samos, Greece 2010.

[10] The method of nonlinear integral equations for the inverse scattering problem in linear elasticity. 13th Panhellenic Conference on mathematical analysis, Ioannina, Greece 2010.

[11] The inverse scattering problem in linear elasticity via a pair of non linear integral equations. 9th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Engineering, Patras, Greece 2009.

[12] The detection of point scatterers in a waveguide. 8th International Workshop on Mathematical Methods in Scattering Theory and Biomedical Engineering, Lefkada, Greece 2007.

Scientific Collaborations

Visiting researcher at:

31/01/20 – 09/02/20	National Technical University of Athens, Greece
25/04/18 – 30/04/18	National Technical University of Athens, Greece
02/07/17 – 07/07/17	University of Texas at Austin, USA
05/09/16 – 11/09/16	National Technical University of Athens, Greece
15/02/16 – 20/02/16	National Technical University of Athens, Greece
14/10/14 – 31/10/14	Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austria
15/03/14 – 18/03/14	National Institute of Applied Sciences of Lyon (INSA), France

Professional Activities

[1] Lecturer, Winter-school "Applied mathematics: as useful as exciting" organized by the Austrian Study Foundation of the Austrian Academy of Sciences, Kefermarkt, Austria, 2020.

[2] Organizing Committe, Workshop "4th Internal SFB Meeting: The Physics behind", Vienna, Austria, 2020.

[3] Organizer, Mini-symposium "Inverse Problems in Elastography and Coupled-Physics Imaging", with P. Elbau (University of Vienna, Austria), Applied Inverse Problems Conference, Grenoble, France 2019.

[4] Organizer, Mini-symposium "Reconstruction Techniques in Quantitative Imaging ", with P. Elbau (University of Vienna, Austria), Ninth International Conference "Inverse Problems: Modeling and Simulation", Malta 2018.

[5] Scientific Committee, Workshop "Quantitative Tomographic Imaging - Radon meets Bell and Maxwell", Linz, Austria 2017.

[6] Organizer, Mini-symposium "Inverse problems in quantitative optical and electrical tomography", with K. Knudsen (DTU, Denmark), Applied Inverse Problems 2017, Hangzhou, China 2017.

[7] Organizer, Mini-symposium "Hybrid Imaging", 8th International Conference: Inverse Problems: Modeling and Simulation, Fethiye, Turkey 2016.

[8] Organizer, Mini-symposium "Mathematical Methods in Photoacoustic Tomography and Optical Coherence Tomography", with P. Elbau (University of Vienna, Austria), ECMI 2014: The 18th European Conference on Mathematics for Industry, Taormina, Italy 2014.

Technical Skills

Computing Systems:	MATLAB, Mathematica
Programming Languages:	Python, C

Languages

Greek:	Native
English:	Fluent
German:	Proficient