Curriculum Vitae



Toufic El Arwadi
Born 22/11/1982 at Bologna,Italy
Nationality : Lebanese
Current position : Professor
ORCID : https ://orcid.org/my-orcid ?orcid=0000-0002-0394-5662
Google Scholar : https ://scholar.google.com/citations ?user=jr11PTMAAAAJhl=froi=sra

Address : Department of Mathematics and computer sciences
Faculty of Science,
Beirut Arab University,
P.O.Box : 11-5020, Beirut, Lebanon
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Education

2006 - 2010 **Ph.D. in Mathematics**
Title : *New approach of the D-bar method for the inverse conductivity problem*
Supervisors : Hassan Emamirad, Serge Huberson
Laboratory of Mathematics and applications (LMA), Poitiers, France
Degree : with highest honours
Referees : Habib Ammari and Marc Dambrine

2005 - 2006 **Master 2 Mathematics**, Paul Verlaine University, Metz, France

2003 - 2004 **Master 1 Mathematics**, San-Joseph university, Beirut, Lebanon

2002 - 2003 **B.S. Mathematics**, San Joseph University, Beirut, Lebanon

Scientific computer computations

Languages : Fortran 77 90, C, C++
others : Scilab, Freefem++, LaTeX, Gnuplot, MS office

Languages

Arabic : Basic language. French : Very good. English : very good. Italian : Beginner

Teaching

- Undergraduate courses : Set theory, Linear Algebra, Probability and statistics, Numerical Analysis, Discrete Mathematics, Real Analysis I, Real Analysis II, Operation Research, Differential Geometry, Topology, Differential Calculus, Mathematical methods for physics, Financial mathematics, Business Mathematics, Advanced numerical analysis, Introduction to Calculus and Analytic geometry.
- Graduate courses : Advanced numerical analysis, Research topics, The finite element method, Numerical linear Algebra, Distributions theory, Evolution equations, Spectral theory, Measure and integration, Advanced analysis and applications.

Research Interest.

- Inverse problems
- Partial Differential Equations
- Numerical methods for integral and partial differential equations
- Control theory and hyperbolic systems
- Analysis of systems in fluid dynamics
- Water wave theory asymptotic models

Student Advising

- Rola Alayli (with Dr. A. El Zaart) Master thesis. (graduated 2013)
- Ali Kadhim (with Dr. Z. Khalil) Master thesis. (graduated 2014)
- Hoda Malak (with Dr. A. Tamasan) Master thesis. (graduated 2015)
- Alaa Al Sayed (with Dr. H. Chrayteh) Master thesis.(graduated 2016)
- Soltan Al Kontar (with Dr. H. Chrayteh) Ph.D thesis. (graduated 2017)
- Ali Ghoson (with Dr. A. Zaart) Master thesis. (graduated 2018)
- Nour Abou Jmeih (with Dr. H. Chrayteh) Master thesis.(graduated 2018)
- Marwa Itani (with Dr. E. Ashmawy) Master thesis.(graduated 2018)
- Mirna Fares (with Dr. E. Ashmawy) Master thesis.(graduated 2018)
- Rola Ahmad (with Dr. H. Chrayteh) Ph.D thesis.(graduated 2018)
- Mohamad Haidar (with Dr. S. Israwi) Ph.D thesis. (graduated 2020)

- Mohamad Hindi Master thesis.(graduated 2020)
- Sarah Slayi (with Dr. E. Ashmawy) Ph.D thesis. (graduated 2021)
- Moussa Bzeih (with Dr. A. Wehbe) Ph.D thesis. (graduated 2022)
- Hamza Zougheib Ph.D thesis. (graduated 2024)
- Marwa Birjawi (with Dr. S. Israwi) Ph.D thesis. (graduated 2025)
- Marwa Jomaa Ph.D thesis. (graduated 2026)
- Ihsan Hamzeh Ph.D thesis.
- Katia El Khatib (with Dr. S. Israwi)
- Zahraa Bdeir (with Dr. W. Youssef)

Publications

1. T. El Arwadi *Méthode De Dbar Pour La Résolution Du Problème De Conductivité, Nouvelle Approche* (Europian University Edition)

2. T. El Arwadi *Error estimates for reconstructed conductivities via the D-bar method*. Numerical Functional Analysis and Optimization ,Vol. 33, Iss. 1, 2012 ,pp 21-38

3. M.A. Cherif and T. El Arwadi . *D-Bar Method for Smooth and Nonsmooth Conductivities* Numerical Functional Analysis and Optimization .Vol. 35, Iss. 2, 2014 ,pp 198-222

4. M.A. Cherif, T. El Arwadi, H. Emamirad, J.M Sac Épée *The Dirichlet-to-Neumann semigroup acts as a magnifying glass* Semigroup Forum, Vol. 88, Iss. 3, 2014 ,pp 753-767

5. R. Ahmad, T. El Arwadi, H. Chrayteh, J.M Sac Épée *A Crank-Nicolson Scheme for the Dirichlet-to-Neumann Semigroup* J. App. Math, Vol. 2015, Article ID 429641, http : dx.doi.org/10.1155/2015/429641

6. T. El Arwadi, S. Dib, T. Sayah *A Priori and A Posteriori error estimates for an elleptic problem with dynamical boundary conditions* App. Math. Inf. Sc., 6 (9), DOI :10.12785/amis/100121 (2015) pp 2205-2217

7. T. El Arwadi, T. Sayah *Lp estimates for Dirichlet-to-Neumann operator and applications* EJDE, Vol. 2015, No. 258 pp 1-8, ISSN : 1072-6691

8. T. El Arwadi, V. Flammang, G.Rhin, J.M Sac Épée *Extension of the notion of Mahler measure to a certain class of holomorphic functions. Properties and applications.* Results in Math 72, no. 1-2, 787-791 (2017)

9. S. Al Kontar, T. El Arwadi, H. Chrayteh, J.M Sac Épée *About the D-Bar reconstruction method for complex conductivities : Error estimates* Journal of Analysis and Applications Vol. 16 (2018), No.1, pp.1-40

10. T. El Arwadi, M. Amine Cherif
The Schauder and Krasnoselskii Fixed-Point Theorems on a Frechet Space Mediterranean Journal of Mathematics (2018) 15 :121 https ://doi.org/10.1007

11. M. Ali Haidar, T. El Arwadi, S. Israwi *Existence of a regular solution for 1D Green-Naghdi equations with surface tension* Boundary Value Problem (2018) 2018 : 136. https ://doi.org/10.1186/s13661-018-1055-2

12. T. El Arwadi, T. Sayah *A Regularization Scheme for 2D Conductivity Imaging by the D-Bar Method* Numerical Functional Analysis and Optimization, 40 :12, 1410-1425, DOI : 10.1080/01630563.2019.1606011

13. T. El Arwadi, M.I Copetti, W. Youssef *On the theoretical and numerical stability of the thermoviscoelastic Bresse system* Z Angew Math Mech. 2019, 99 :e201800207, https ://doi.org/10.1002/zamm.201800207

14. T. El Arwadi, W. Youssef *On the Stabilization of the Bresse Beam with Kelvinâ Voigt Damping* Appl Math Optim (2019). https ://doi.org/10.1007/s00245-019-09611-z

15. M. Berjawi, T. El Arwadi, S. Israwi *A rigorous derivation of the extended KDV equation* J. Physics Equations : Conf. Series (2020). 1564 (2020) 012006 IOP Publishing , doi : 10.1088/1742-6596/1564/1/012006

16. T. El Arwadi, T. Sayah *A new regularization of the D-bar method with complex conductivity* Complex Variables and Elliptic Equations (2021). 66 :5, 826-842, DOI : 10.1080/17476933.2020.1747056

17. M.Haidar, T. El Arwadi, S.Israwi *Explicit solutions and numerical simulations for an asymptotic water waves model with surface tension* J. Appl. Math. Comput. 63, 655â681 (2020). https ://doi.org/10.1007/s12190-020-01333-8

18. M.Berjawi, T. El Arwadi, and S. Israwi, (2020). *A theoretical study of an extended KdV equation.* WSEAS Transactions on Fluid Mechanics, 15, 110-

110. https ://doi.org/10.37394/232013.2020.15.10

19. N. Abou Jmeih, T. El Arwadi, S.Dib *A Priori Error Analysis of a Stabilized Finite-Element Scheme for an Elliptic Equation with Time-Dependent Boundary Conditions* Numer. Analys. Appl. 14, 297â315 (2021). https ://doi.org/10.1134/S1995423921

20. M. Elhindi, T. El Arwadi *Analysis of the thermoviscoelastic Timoshenko system with diffusion effect.* Partial Differ. Eqns. Appl. Math. 4, 100156 (2021) https ://doi.org/10.1016/j.padiff.2021.100156

21. M.Bzeih, T. El Arwadi, A. Wehbe, M.Rincon, R.Madureira *Numerical analysis and simulation for a wave equation with dynamical boundary control* J. Sci. Comput. 87(1) : 6 (2021)

22. M.Haidar, T. El Arwadi, S.Israwi *On the Green Naghdi system with surface tension in the Camassa-Holm scale* Ann Univ Ferrara 67, 83â110 (2021). https ://doi.org/10.1007/s11565-021-00357-7

23. M. Copetti, T. El Arwadi, J.Fernandez, M. G Nazo, W. Youssef*Analysis of a contact problem for a viscoelastic Bresse system* ESAIM : Mathematical Modelling and Numerical Analysis 55 (3), 887-911

24. S.Slayi, T. El Arwadi, S. Dib *A Gauge-Uzawa scheme for a 2D micropolar Naviers Stokes system* Applied Numerical Mathematics 167, 45-72 (2021)

25. M.Bzeih, M.Hindi, T. El Arwadi *Numerical analysis for Rayleigh system with dynamical boundary control* Arab. J. Math. 10, 331â349 (2021). https ://doi.org/10.1007/s40065-021-00310-8

26. T. El Arwadi, S. Israwi *An explicit solution with correctors for variable depth KdV and Camassa-Holm equations*, Journal of Engineering Mathematics 131 (1), 1-14

27. M.Hindi, K. Zennir, J. Ouchenane, A. Choucha and T. El Arwadi *Bresse-Timoshenko type systems with thermodiffusion effects : Well-posedness, stability and numerical results* Rend. Circ. Mat. Palermo, II. Ser 72, 169â194

(2023). https ://doi.org/10.1007/s12215-021-00672-0

28. D. SA. Junior, A. Ramos, M. Freitas, MJ. Dos Santos and T. El Arwadi *Polynomial stability for the equations of porous elasticity in one-dimensional bounded domains.* Math. Mech. Solids, 27, 2021, http ://dx.doi.org/10.1177/10812865211019074

29. T. El Arwadi, A. Wehbe, W. Youssef *Discrete observability of the Bresse Beam* Math. Mech. of Solids. 2022 ; doi :10.1177/10812865221109159

30. B. Feng, T. El Arwadi, W. Youssef *Polynomial and exponential decay rates of a laminated beam system with thermodiffusion effects* J. Math. Anal. Appl., 517 (2) (2023), https ://doi.org/10.1016/j.jmaa.2022.126633

31. M. Berjawi, T. El Arwadi, S.Israwi *A shallow water modeling with the Coriolis effect coupled with the surface tension* Monatsh Math (2023). https ://doi.org/10.1007/s00605-022-01772-4

32. M.Bzeih, T. El Arwadi, A. Wehbe, M.Rincon, R.Madureira *A finite element scheme for a 2D- wave equation with dynamical boundary control* Math. Comp. Sim.,205, (2023) https ://doi.org/10.1016/j.matcom.2022.09.024.

33. A. Djebabla, H. Bouraoi, T. El Arwadi *Exponential stability for a thermoelastic Bresse system : theoretical and numerical study* Math Meth Appl Sci. 2023 ; 46(5) : 6002- 6024.https ://doi :10.1002/mma.8885

34. H. Zougheib, T. El Arwadi, M. Rincon, R. Madureira *Do equal speed condition and exponential stability relate for the truncated thermoelastic Timoshenko system under Green Naghdi law ?* Journal of Thermal Stresses (2023), 46(8), 673-705. https ://doi.org/10.1080/01495739.2023.2217233

35. H. Zougheib, T. El Arwadi *Energy decay analysis for porous elastic system with thermoelasticity of type III : a second spectrum approach* (2024), Results in Applied Mathematics, 21, e100435, https ://doi.org/10.1016/j.rinam.2024.100435

36. J. Hassan, S. Messaoudi, T. El Arwadi, M. Hindi *Theoretical and numerical study of the decay in a viscoelastic Bresse System* Discrete Contin. Dyn. Syst., Ser. B (2024), https ://doi.org/10.3934/dcdsb.2024100

37. T. El Arwadi, W. Youssef *Stabilization of the Bresse system with thermodiffusion effect* Mathematics of Control, Signals, and Systems 35 (4), 905-925

(2024) https ://doi.org/10.1007/s00498-023-00358-1

38. H. Zougheib, T. El Arwadi, M. El Hindi *Energy decay analysis for Porous elastic system with microtemperature : Classical vs second spectrum approach.* Partial Differential Equations and Applications, 5(2), 6. (2024). https ://doi.org/10.1007/s42985-024-00273-3

39. H. Zougheib, T. El Arwadi, M. Rincon, R. Madureira *Asymptotic analysis for porous elastic system with Kelvin Voigt daming : The second spectrum perspective* Computational and Applied Mathematics 43.4 (2024) : 215. https ://doi.org/10.1007/s40314-024-02621-w

40. A. Djebabla, H. Bouraoi, T. El Arwadi *New stability result for Bresse system with dual-phase-lag thermoelasticity* Applicable Analysis, 103(16), 3049-3066. (2024) https ://doi.org/10.1080/00036811.2024.2332400

41. H. Zougheib, T. El Arwadi, A. Soufyane *Asymptotic behavior of the porous elastic system with dual phase lag model : classical vs second spectrum perspectives* Studies in Applied Mathematics, 151(3), 1136-1165. (2024) https ://doi.org/10.1111/sapm.12622

42. M. Berjawi , T. El Arwadi , S. Israwi , R. Talhouk *Well-posedness of the Green Naghdi model for an uneven bottom in presence of the Coriolis effect andsurface tension* Stud Appl Math. (2024) ;e12725. https ://doi.org/10.1111/sapm.1272

43. M. Berjawi, T. El Arwadi, S. Israwi *A well-posedness result for an extended KdV equation* (2025) Part. Diff. Eq. App. Math. (10) https ://doi.org/10.1016/j.padiff.2024.100715

44. M. Haidar, T. El Arwadi, S. Israwi *Asymptotic analysis for a shear beam model with thermoelastic diffusion damping* (2025) Ricerche. Matematica (2024). https ://doi.org/10.1007/s11587-024-00904-2

45. H. Zougheib, T. El Arwadi, H.A. Bouraoui, A. Djebabla (2025). *Stabilization of Lord Shulman Porous thermoelastic system from second spectrum viewpoint.* Afrika Matematika, 36(2), 1-17 https ://doi.org/10.1007/s13370-025-01310-z

46. M. Jomaa, T. El Arwadi, S. Israwi and S. Boulaaras (2026) *On the Stability of Timoshenko System With Foundation From the Classical and Second Spectrum Perspectives.* Mathematical Methods in the Applied Sciences, 49(1),

366-391. https ://doi.org/10.1002/mma.70157

47. M. Jomaa, T. El Arwadi, S. Israwi and Dilberto DS Almeida JÃºnior (2026) *Energy decay of damped Timoshenkoâtype beams on two-parameter elastic foundations.* Communications in Analysis and Mechanics, 18(2), 296-328. http ://dx.doi.org/10.3934/cam.2026012

48. T. Sayah , T. El Arwadi (2026) *Exponential decay of the discrete energy for the wave-wave coupled system.* Mathematics and Mechanics of Solids, 10812865251382164 https ://doi.org/10.1177/10812865251382164

49. H. Zougheib, T. El Arwadi, R. LR Madureira, M. A Rincon, T. Sayah (2026) *Exponential stability of a fully discrete energy associated to a thermoviscoelastic Timoshenko system* Journal of Thermal Stresses,49(5), 635â650, https ://doi.org/10.1080/01495739.2025.2574703

50. H. Zougheib, T. El Arwadi and T. Sayah (2026)*A New Perspective on the Energy Decay of the TimoshenkoâEhrenfest System : The Non-Local Truncated Approach* Mathematics, 14(7), 1132. https ://doi.org/10.3390/math14071132

51. M. Haidar, T. El Arwadi, S. Israwi and C. Aoun (2026)*A numerical study of KdV and CH equations with surface tension* Water Waves, 8, 71â91 . https ://doi.org/10.1007/s42286-026-00136-x

52. J. Lahoud, T. El Arwadi and T. Sayah (2026) *Steady state micropolar Navier-Stokes system : A posteriori error studies,* Applied Numerical Mathematics, 227, 42-63 . https ://doi.org/10.1016/j.apnum.2026.04.005.

53. M.D Aouragh, M. El Baz, T. El Arwadi, and T. Sayah (2026). *Asymptotic behavior of viscoelastic shear beam model : theoretical and numerical studies,* Rendiconti del Circolo Matematico di Palermo Series 2, 75(5), 152. https ://doi.org/10.1007/s12215-026-01479-7.

Conferences, workshops, research trimester

02/2009	Contrôle et Problèmes Inverses pour les EDP : Aspects Théoriques et Numériques, at CIRM, Luminy.
05/2009	Journées de Metz 2009 at LMAM, Metz.
09/2009	Workshop FreeFem++ at Henri Poincaré institute.
03/2010	Inverse Problems for Waves : Methods and Applications (Ecole Polytechnique, Palais
05/2010	Journées de Metz 2010 at LMAM, Metz.
06/2010	Summer school on computational solution of inverse problems (Helsinki university)
06/2011	Trimester on Inverse Problems : Theoretical and Numerical Aspects of Inverse Problems and Scattering Theory (Madrid)
07/2012	9th AIMS workshop (Orlando)
07/2015	Journée d'Analyse (San Joseph University)
10/2015	Journée des Problèmes Inverse (University Badgi-Mokhtar, Annaba, Algeria)
03/2016	Partial Differential Equations meeting (Lebanese University)
07/2016	11th AIMS workshop (Orlando)
06/2017	Journés de Mathématiques Appliquées, Saint Joseph University (Beirut-Lebanon)
06/2024	Workshop of control and inverse problems, (American University of Beirut)

Collaborators

— A. Tamasan (UCF, Florida, USA)

— M.A Cherif (Sfax university, Tunisia)

— H. Emamirad (Poitiers university, France)

— J.M Sac-Epée (Lorraine university, France)

— G. Rhin (Lorraine university, France)

— T. Sayah (San-Joseph university, Lebanon)

— A. Wehbe (Lebanese University, Lebanon)

— W. Youssef (Lebanese University, Lebanon)

— S. Israwi (Lebanese University, Lebanon)

— M. Rincon (University Federal Rio de Janeiro)

— R. Madureira (University Federal Rio de Janeiro)

Recent Invited Talks at Conferences and Workshops

- ***01/2010*** Séminaire d'Analyse Appliquée (Paris 13 university) *New approach for the Dbar method*
- ***03/2010*** Poster session at MMNS Workshop on Inverse Problems for Waves : Methods and Applications (Ecole Polytechnique, Palaiseau) *D-bar methods for the Inverse conductivity problem*
- ***06/2010*** Summer school on computational solution of inverse problems (Helsinki university) *New approach of the D-bar methods*
- ***09/2010*** Basque Center of Applied mathematics (Bilbao) *New approach of the D-bar methods*
- ***01/2011*** L.A.T.P (Marseille) *New approach of D-bar methods for non smooth conductivities*
- ***05/2011*** Trimester on Inverse problems (Madrid) *New approach for D-bar methods*
- ***12/2012*** LSMS meeting *New approach of D-bar methods*
- ***07/2012*** 9th AIMS workshop (Orlando) *New approach of D-bar methods*
- ***12/2012*** Lebanese University - Fanar *New approach of D-bar methods*
- ***09/2013*** San-Joseph University *On the Dirichlet-to-Neumann semigroup*
- ***07/2015*** San-Joseph University *The electrical Impedance Tomography and inverse problems*
- ***10/2015*** Université Badji Mokhtar Annaba *New approach of D-bar methods for smooth and non smooth conductivities*
- ***03/2016*** Lebanese University *Lp estimates for the D-bar method*
- ***07/2016*** 11th AIMS workshop (Orlando) *On the stability of reconstructiong convection terms from boundary measurements*
- ***03/2017*** Journée de Mathématiques Appliquées (Saint Joseph University) *Theoretical and Numerical Observability of the Bresse Beam*
- ***06/2018*** Problemes inverse, control et optimization de formes (American University of Beirut) *Improvement of the D-bar method for the inverse conductivity problems*
- ***06/2024*** Workshop of control and inverse problems, (American University of Beirut) Stabilization of a viscoelastic Bresse contact problem

Master thesis

- ***2006*** Master 2 *The Level set method with topological preservations, and applications in shape optimization* under direction of Dorin Bucur and Zakaria Belhachmi (Lorraine University)
- ***2004*** Master 1 *The Richard Feynman Path Integral and some applications in quantum physics* under direction of Jacques Langlois (Saint Joseph University)

Reviewer

Research Journals :

- Inverse Problem and Imaging (American Institute of Mathematical Science-USA)
- Journal of Mathematics (Wiley)
- Journal of Applied Mathematics (Wiley)
- Mathematical Methods in the Applied Sciences
- Electronic Journal of Differential Equations (Texas state University- USA)
- Inverse Problems (IOP science- UK)
- International Journal of Nonlinear Sciences and Numerical Simulation (De Gruyter- Germany)
- Computational and Applied Mathematics (Springer-Germany)
- Journal of Applied and Computational Mathematics (Springer-Germany)
- Applied Numerical Mathematics (Elseiver-Netherlands)
- Zeitschrift fur angewandte Mathematik und Physik (Springer-Germany)
- AIMS Mathematics (AIMS press-USA)
- Discrete and Continuous Dynamical Systems Series S. (AIMS Press-USA)
- Journal of Thermal Stresses (Taylor and Francis UK)
- Results in Applied Mathematics (Elseiver-Netherlands)

International Scientific Committees and Research groups

- 2012 -2015 Lebanese Society for the Mathematical Sciences (National Relations)
- 2015- Lebanese Society for the Mathematical Sciences (International Relations)
- 2016- Linear Algebra and High Performance Computing for Simulations (Member)

Meetings and Seminars organization.

- 2012 - LSMS annual meeting (member of the scientific committee).
- 2013 - LSMS annual meeting (member of the organizing committee).
- 2014 - LSMS annual meeting (member of the organizing committee).
- 2014 - LAAS annual Workshop (member of the scientific committee).
- 2015 - Day of Partial Differential Equations (member of the Organizing committee).
- 2016 - LAAS annual workshop (member of the scientific committee).
- 2016 - LSMS annual meeting (member of the organizing committee).
- 2017 - LSMS annual meeting (member of the organizing committee).
- 2018 - LSMS annual meeting (member of the organizing committee).
- 2018 - PICOF meeting (member of the organizing committee).
- 2018 - SIRCAUSS conference (member of the organizing committee-poster

session).

Department and University services .

- Curriculum committee, member.
- Comprehensive exam committee, member.
- Students Activities committee, member.
- Day of Partial Differential Equations (BAU), Organizer.
- Graduate seminar in Mathematics and Computer sciences, organizer.
- Research committee , Member.
- Students activities committee , Member.

References .

- Professor Mauro Antonio Rincon , Universidade Federal do Rio de Janeiro rincon@dcc.ufrj.br .
- Professor Salim Messaoudi smessaoudi@sharjah.ac.ae University od Sharjah
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- Professor Toni Sayah toni.sayah@usj.edu.lb Saint Joseph University of Beirut