Curriculum Vitae of Dr. Aïcha Bounaïm

Principal Scientific Computing Eng., PhD – SLB Norway technology Center

Personal
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Competencies

- Energy Transition; New Energy/Renewables
- CCS (Carbon Capture and Storage), Hydrogen production technologies
- Digital Transformation
- Machine Learning, Artificial Intelligence
- Applied Mathematics, Numerical simulation, and Scientific Computing
- Mathematical modeling of complex systems and Numerical analysis
- Geophysics: Seismic interpretation, Seismic attributes, 4D seismic Analysis
- Multi-type/scale Data analysis: Digital outcrop analysis, Satellite imagery, LiDAR
- Computer skills: Diverse Programming languages (Lunix and Windows), Parallel computing; Cloud computing, High Performance Computing
- Expert and International Reviewer of higher education technology programs
- Expert/Evaluator/Vice-Chair for European Commission
- Evaluator / interview Panel for UK Research and Innovation (UKRI) Future Leaders Fellowships
- Teaching experience from French and Norwegian higher education systems
- Mentoring; Promoting Knowledge sharing and Industry-University relations.
- Assessor for technology accelerators (TechStars, TechX NetZero Technology centre)

Education

Nov 2022	**Energy Transition, University of Bergen** Master's degree module.
June 1999	**Ph.D. in Applied Mathematics,** Laboratory of Modeling and Computing, University Joseph Fourier, Grenoble, France. (With Distinction: Mention Très Honorable in French) Thesis: **Domain Decomposition Methods: Application to the Solution of Optimal Control Problems** Advisor: Prof. Jacques Blum
June 1994	**Master's Degree in Applied Mathematics – Partial Differential Equations and Numerical Analysis,** Laboratory of Modeling and Computing, University Joseph Fourier, Grenoble, France. (With Distinction: *Mention Assez Bien* in French) Thesis: **Domain Decomposition Methods using an Augmented Lagrangian Method for an Optimal Control Problem.** Advisor: Prof. Jacques Blum

June 1993	**Bachelor's in Applied Mathematics – Partial Differential Equations and Numerical Analysis,** Faculty of Sciences, University Hassan II, Casablanca, Morocco. (With Distinction: *Mention Assez Bien* in French)

Research and Technical Experiences

Apr 2023 – Present	**Principal Scientific Computing Engineer,** SLB Norway technology Centre (SNTC), Stavanger, Norway.
Oct 2005 – Mar 2023	**Senior Research Scientist** at Schlumberger Research, Stavanger, Norway.
2016 - Present	**Vice-Chair – Coordinator** for the evaluation process of European Industrial Doctorate Panel / Engineering for Horizon2020 European programs / Research Doctoral Programs and Individual Research Projects; Coordination and management of evaluation process.
Dec 2015 – Jan 2016	**International Expert Reviewer** of *the Research Programme of Riga Technical University 2016 – 2020.*
2011 - Present	**Expert – Evaluator – Reviewer** for the European Commission within FP7 and Horizon2020 programs: - Math-Physics & Engineering & Life & Environment panels. - WIDESPREAD (Teaming and Twinning) action panel.
2014 – 2015	**Expert – Evaluator** for the European Commission, Evaluation of proposals within: *Topic PHC-11: Development of new diagnostic tools and technologies: in vivo medical imaging technologies* – Medical Imaging.
July 2004 – Oct 2005	**Research Scientist** at Norwegian Meteorological Institute, Research and Development Division, Oceanography Section, Oslo, Norway.
Apr 2000 – Apr 2004	**Postdoctoral Research Fellow (25% in teaching)**, Scientific Computing Group, Department of Informatics - University of Oslo and SIMULA Research Laboratory, Oslo, Norway.
Jul 1999 - Sept 1999	**Research Assistant in the IDOPT** Project of **INRIA** (National Institute of Research in Informatics and Automatic), Grenoble, France.
Jan 1995 - Jun 1999	**Research Fellowship from INRIA (***Bourse de Doctorat),* National Institute of Research in Informatics and Automatic, within **IDOPT** Project (***ID****entification of parameters and* ***OPT****imization)*, Grenoble, France.

Mar 1998 - Jun 1998	**Typo-Reviewer at Collection Grenoble Sciences**, Grenoble, France.

Teaching Experiences

Jan 2007- Jun 2007	**Lecturer** at university of Stavanger, Mathematics for Master's Degree students in Petroleum Engineering, Stavanger, Norway.
Spring 2005	Teaching assistant of Intensive course in C++, University of Oslo, Norway.
Fall 2000 – 2004	**Lecturer** at the Scientific Computing Group, Department of Informatics; University of Oslo, Norway.
Sept 1999 - Av 2000	**Teacher and Researcher**, Department of Informatics, University Institute of Technology, University of Pierre Mendes France, Grenoble, France.
Jun 1999 - Sept 1999	**Contribution to the Distance-Learning Project (ELAN)**, Polytechnic National Institute of Grenoble (INPG), France
Dec1998 - Jun 1999	**Graduate -Teacher in charge of Numerical Analysis Lectures**, The Civil Engineering College (Ecole Nationale des Travaux Publics de l'Etat - ENTPE), Lyon, France.
Sept 1997- Jun 1998	**Undergraduate Teaching Assistant** in Mathematics within *Biology and Geology section* and I*ndustrial Techniques section,* University of Joseph Fourier, Grenoble, France.

Professional Qualifications and Affiliations

- Reviewer for SPE journals (Society of Petroleum Engineers).
- Reviewer for EAGE conferences - Reviewing submitted Extended Abstracts.
- Reviewer for First Break – EAGE Publications.
- Reviewer for Interpretation journal SEG (Society of Exploration Geophysicists)
- Reviewer for IEEE-UFFC (Ultrasonics, Ferroelectrics, and Frequency Control).
- Reviewer for IEEE-Geosciences and Remote Sensing.
- Reviewer for the International Journal of Dynamical Systems and Differential Equations.
- Reviewer for SEG 2008 (abstracts submitted to "Seismic Inversion‟ session), 2008.
- Invited Session chair for EAGE (European Association of Geoscientists and Engineers) conferences in 2016-2017-2018-2019-2020-2021.
- Member of the scientific and organizing committee of the International Conference on Research in Applied Mathematics and Computer Science, University of Casablanca, Morocco, 2019-202-2021.
- Member of the scientific and organizing committee of Virtual International Conference Cybersecurity and Recent Trends in Mathematical Modeling (Smm'2020), Jul 2020.

- Member of the scientific committee of the conference: "Mathematics and Applications to Technology and Environment (MATE) ", held in Tangier, Morocco, May 2007. I also was reviewer and session chairman.

Mentorship / Accelerator Activities

- Assessor for the TechX Net Zero Technology Accelerator: 2021 and 2022
- Invited Mentor for the first Stockholm TechStars class of 12 startups.
- Expert for UK Research and Innovation (UKRI FLF), Future Leaders Fellowships, 2023.
- eMentor for the EAGE Special Interest Group: Women in Geoscience and Engineering, 2018 - Present.
- Mentor and Speaker for Career Center University Abdelmalek Saadi, Tangier and other Engineering schools in Morocco.

Miscellaneous

- From 1994 to 2000: **Voluntary work for school help circle** and responsible of **Arabic Language Learning**.
- 2004-2005: Board member and Leader of Women section at DIF organization in Oslo, Norway
- 2006: Board member and Leader of Muslim Women Association in Rogaland (IKF), Stavanger, Norway
- Volunteering in giving talks at high schools and university in Norway and Morocco to show what we can do with Mathematics and promote STEM (Science, Technology, Engineering, Mathematics) in education.

Languages

- Arabic - French bilingual (Arabic is my mother tongue).
- English: fluent (bilingual French – English).
- Norwegian: successfully passed exams of *Norwegian for International Students* at Univ. of Oslo (Grade B) – added to 20 + years living in Norway.

Favourites

- Sport (exercise, walking, Randonnée)
- Reading – Travelling - Photography
- Volunteering
- Cooking and baking (Moroccan and International);
- Special Interest for Arabic Sciences (in particular Arabic Mathematics)

List of Publications of Aicha Bounaim, PhD.
February 2024

PhD Thesis

1. **A. Bounaim**, Domain Decomposition Methods: Application to the Solution of Optimal Control Problems, Ph.D. Thesis, University Joseph Fourier, Grenoble, France, 1999. (in French).

Publications in Journals / Book Chapters

2. G. Casini, D.W. Hunt, E. Monsen, and **A. Bounaim**, Fracture characterization and modeling from virtual outcrops, 2016, AAPG Bulletin, Vol. 100, No.1 issue, pp. 41-61.
3. Haukas, J., Ravndal, O.R., Fotland, B.H., **Bounaim, A.,** Sonneland, L. 2013. Automated Salt Body Extraction from Seismic Data Using the Level Set Method. First Break, 31 (4): 35-42
4. Erik Monsen, **Aicha Bounaim**, Bérengère Savary-Sismondini, Trond Brenna, Michael Nickel, Lars Sonneland, David William Hunt, Paul Gillespie & John Bernard Thurmond, 2009, Automated interpretation of photorealistic outcrop models. In Outcrops Revitalized: Tools, Techniques and Application. SEPM Concepts in Sedimentary Geology Book, O.J. Martinsen et al. (eds).
5. **A. Bounaim**, S. Holm, W. Chen, and Å. Ødegård, Detectability of Breast Lesions with the CARI Ultrasonography Using a Bio-acoustic Computational Approach, J. of Computers and Mathematics with Applications (in Press), 2006.
6. M. Willatzen, P. Søndergaard, C. Latino, F. Voss, N.L. Andersen, M. Brokate, and **A. Bounaim,** Arrival-Time Detection and Ultrasonic Flow-Meter Applications, *J. Phys.: Conf. Series.* No. **52**, pp.58-72, 2006.
7. **A. Bounaim** and W. Chen, Computations for a Breast Ultrasonic Imaging Technique and Finite Element Approach for a Fractional Derivations Modelling the Breast Tissue Acoustic Attenuation, International Journal of Tomography & Statistics (IJTS), 2005.
8. **A. Bounaim** and W. Chen, and Å. Ødegård, Sensitivity of the Ultrasonic CARI Technique for Breast Tumor Detection Using a FETD Scheme, J. Ultrasonics, Vol. 42. pp. 919-925, April 2004.
9. **A. Bounaim**, S. Holm, W. Chen, and Å. Ødegård, Quantification of the CARI Breast Imaging Sensitivity by 2D/3D Numerical Time-Domain Ultrasound Wave Propagation, J. Mathematics and Computer in Simulation, Vol 65, Issues 4-5, Pages 521-534, 2004.
10. **A. Bounaim**, Méthodes de Décomposition de Domaine : Application à un Problème de Contrôle Optimal, J. of Calculateurs Parallèles, vol. 10(4), pp. 363-370, Hermès Ed., 1998 (in French).

Publications in Refereed Conferences

11. **Aicha Bounaim,** Patricia Fleitas Calzadilla, Nor Azwani Abd Ghapar, Janice Koh Tsui Ann, Rajes Mutthusamy, and Azrin Kassim, Techno-Commercial Assessment Framework for Co-Firing Hydrogen in Gas Power Plants to Reduce Carbon Emission, EAGE 2024 Annual, Submitted extended abstract.

12. **Aicha Bounaim,** Patricia Fleitas Calzadilla, Nor Azwani Abd Ghapar, Janice Koh Tsui Ann, Rajes Mutthusamy, and Azrin Kassim, Techno-Commercial Assessment Framework for Co-Firing Hydrogen in Gas Power Plants to Reduce Carbon Emission, Future Energy Asia 2024, Technical Conference, Bangkok, Paper submitted (Sep 2023), (https://www.futureenergyasia.com/)

13. **Aicha Bounaim**, Which education should we have today for a more sustainable tomorrow? MNT Conference. University of Stavanger, 16-17 Mar 2023. https://www.uis.no/nb/det-teknisk-naturvitenskapelige-fakultet/mnt-konferansen-2023

14. Haege, M., Haukaas, J. and A. **Bounaim** (2022), Efficient identification of reservoir flow connections - How key information from subsurface-related observations can be automatically screened and directly used to update reservoir models, GEOExPro, https://expronews.com/efficient-identification-of-reservoir-flow-connections.

15. Karakaş, C., Etchebes, M., Goledowski, B., Athmer, W., Le Guern, P., Boe, T.H., Nickel, M., Fotland, B.H., Bounaim, A., Haege, M., Gramstad, O., Vaaland Dahl, G., Sarajaervi, M., Tjostheim, B.A., Kiely, J., Granli, J.R., Point, O., Makrigiannis, A. and Melgaard, T. Seismic structural interpretation using geology-driven machine learning approaches: A North Sea case study, Advances in AI/ML for the subsurface, DIGEX 2021 online conference

16. Pierre Le Guern, Tormod Slettemeas, Ann Christin Ferrari Holme, Juha Ahokas, Marie Etchebes, **Aicha Bounaim**, Cagil Karakas, and Jon Erik Skeie, From analog to digital Geology: How to maximize the value of field and drone data in an integrated workflow using next generation algorithms, machine learning and process models in a cloud-based data ecosystem for improved Exploration, subsurface characterization and virtual training, NGF Winter Conference, 6-8 Jan 2021. https://www.geologi.no/konferanser/vinterkonferanser/arkiv/item/1115-presentasjon-vk21

17. Cagil Karakas, Marie Etchebes, Bartosz Goledowski, Wiebke Athmer, Pierre Le Guern, Trond Hellem Bø, Michael Nickel, Bjørn Harald Fotland, **Aicha Bounaim**, Martin Haege, Oddgeir

Gramstad, Geir Vaaland Dahl, Martin Sarajaervi, Bent Audun Tjostheim, James Kiely, John Reidar Granli, Olivier Point, Alexandra Makrygiannis, and Thomas Melgaard, Seismic structural interpretation using geology-driven machine learning approaches: A North Sea case study**,** DIGEX 2021 conference, 17-18 Feb 2021.

18. Athmer, W., Haege, M., Goledowski, B., Etchebes, M., Karakas, C., Boe, T.H., Sarajaervi, M., Nickel, M., **Bounaim, A**. & Le Guern, P.: Multiscale Fault and Fracture Characterization: Advantages and Limitations of Various Methods. Invited Paper for the SEG/SPE Workshop "Multi-Scale Reservoir Surveillance & Monitoring**"**, Virtual Workshop, 7–9 December 2020.
19. Pierre Le Guern, Marie Etchebes, and **Aicha Bounaim**. From digital exposed analogues to sub-surface reservoir characterization. Extended abstract submitted to the First EAGE Workshop on Unmanned Aerial Vehicles, to be held 2-4 December 2019 in Toulouse, France.
20. Marie Etchebes, **Aicha Bounaim**, Trond Brenna, and Pierre Le Guern. An advanced integrated workflow for efficient and automated quantitative interpretation of digital outcrop analogues, Extended abstract submitted to the First EAGE Workshop on Unmanned Aerial Vehicles, to be held 2-4 December 2019 in Toulouse, France.
21. **Bounaim A**., Etchebes M., Haukås J., Borgos H., Fotland B. H., and Sonneland L., Vector Attributes – A family of advanced seismic attributes to assist in geological interpretation, *SEG 2019, 15-21 Sep 2019, San Antonio, TX, USA.*
22. Etchebes M., Boe T. H., **Bounaim A**., Brenna T., Steckhan D., Nickel M., Borgos H. G., Le Guern P., Athmer W., Fotland B. H. and K. S. Boge. Innovative workflow for structural seismic interpretation: Combining automated technologies with structural analysis techniques. *SEG 2019*, *15-21 Sep 2019, San Antonio, TX, USA.*
23. Etchebes M., Boe T. H., **Bounaim A.,** Brenna T., Steckhan D., Nickel M., Borgos H. G., Le Guern P., Athmer W., Fotland B. H. and K. S. Boge. Innovative workflow for structural seismic interpretation: Combining automated technologies with structural analysis techniques, New Advances in Seismic Interpretation Workshop – 15-17 April 2019, Muscat, Oman.
24. Etchebes M., **Bounaim A.,** Brenna T., and D., Steckhan. Fault characterization using advanced seismic interpretation techniques – Quantitative input for optimal well placement in structurally complex reservoirs. Submitted to 81st EAGE Conference & Exhibition 2019, 3-6 June, London, UK.
25. **Bounaim A**. and Sonneland L., Resolution Boosting of Seismic Data Using Hessian Analysis, 78th EAGE Conference & Exhibition, Copenhagen 2018. Extended abstracts.
26. **Bounaim A**., Etchebes M., Haakas J. and Borgos H., Vector attributes: An approach based on the analysis of normal vector field to seismic layering for assisting in geological interpretation, Geo 2018 in Bahrain, March 2018.
27. J. Haukas, W. Athmer, J. O. H. Bakke, Q. D. Boersma, **A. Bounaim**, M. Etchebes, P. G. Folstad, B. H. Fotland, R. Moe, C. Pacheco and E. Tolstukhin, Analysis of enhanced permeability using

4D seismic data and locally refined simulation models, NPF Reservoir & Production Management Conference, 23-24 October 2018

28. J. Haukas, W. Athmer, J. O. H. Bakke, Q. D. Boersma, **A. Bounaim**, M. Etchebes, P. G. Folstad, B. H. Fotland, R. Moe, C. Pacheco and E. Tolstukhin, Analysis of enhanced permeability using 4D seismic data and locally refined simulation models, IOR Norway 2018, 23-25 April, 2018
29. Jarle Haukås, **Aicha Bounaim** and Oddgeir Gramstad, Automated salt interpretation, Part II: Smooth surface wrapping of volume attribute, SEG International Exposition and 87th Annual Meeting in Houston, Texas, USA, September 2017.
30. Marie Etchebes, **Aicha Bounaim**, Trond Brenna, Salvador Bayarri and Paul Tapponnier, Automated Quantitative Outcrop Analysis (AQOA), AAPG-SEG 2017, London, Submitted.
31. Etchebes, M**., Bounaim A**., Brenna T. and Tapponnier P. User-guided structural interpretation toolbox for Digital Outcrop Models. 2nd Virtual Geoscience Conference (VGC 2016), Bergen, Sept 2016.
32. Etchebes, M., Athmer, W., Stueland E., Robertson, S.C., **Bounaim, A**., Steckhan, D., Boe, T.H., Sonneland, L. & Granli, J.R.: Fault kinematic and Mesozoic paleo-stress evolution of the Hoop fault complex, Barents Sea. EGU General Assembly 2016, Vienna, Austria.
33. **BOUNAIM, A**., BOE, T. H., ATHMER, W., SONNELAND, L. & KNOTH, O. (2013): Large Fault Extraction using Point Cloud Approach to a Seismic Enhanced Discontinuity Cube. Extended Abstracts, 75th EAGE Conference and Exhibition, London, United Kingdom.
34. ATHMER, W., **BOUNAIM, A.** & SONNELAND, L. (2013): Hierarchical fault and fracture prediction. Proc. AAPG Annual Convention and Exhibition, 19-22 May, Pittsburgh, USA. (http://www.searchanddiscovery.com/abstracts/html/2013/90163ace/abstracts/athm.htm)
35. **BOUNAIM, A**., BOE, T.H., ATHMER, W. & TARDIF D'HAMONVILLE, P. (2013): Fault extraction using point cloud approach to a seismic enhanced discontinuity cube. Proc. AAPG Annual Convention and Exhibition, 19-22 May, Pittsburgh, USA. (http://www.searchanddiscovery.com/abstracts/html/2013/90163ace/abstracts/boun.htm)
36. Haukaas, J., Ravndal, O.R., Fotland, B.H., **Bounaim, A.,** Sonneland, L. 2013. *Automated Salt Body Extraction from Seismic Data Using the Level Set Method*. *First Break*, **31** (4): 35-42.
37. Haukaas, J., Ravndal, O.R., Fotland, B.H., **Bounaim, A.,** and Sonneland, L.: *Automated Salt Body Extraction from Seismic Using the Level Set Method.* 74th EAGE Conference & Exhibition, Copenhagen 2012. Extended abstracts.
38. Erik Monsen, **Aicha Bounaim**, Bérengère Savary-Sismondini, Trond Brenna, Michael Nickel, Lars Sonneland, David Hunt, Paul Gillespie and John Thurmond, "Automated interpretation techniques tailored to photorealistic outcrop data", SEPM research conference - "Outcrops Revitalized: Tools, Techniques and Applications", Kilkee, Ireland, June 2008.

39. Bérengère Savary-Sismondini, Erik Monsen, **Aicha Bounaim**, Anne Louise Larsen, Michael Nickel, Lars Sonneland, Dave Hunt, Paul Gillespie, John Thurmond, "Fracture Population of Carbonate Geological Models using Digital Outcrop Data", GEO2008, Bahrain, March 2008.
40. Savary-Sismondini, B., Monsen, E**., Bounaim, A**., Larsen, A.L., Nickel, M., Sonneland, L., 2007. Fracture Population of Carbonate Geological Models using Digital Outcrop Data. Reservoir Symposium 2007, Paris (18-20 June).
41. Monsen, E., Savary-Sismondini, B**., Bounaim, A**., Brenna, T., Pedersen, S. I., Tjostheim, B., Sonneland, L., 2007. Automated 3D Interpretation of Fractures from Photorealistic Outcrop Models. EAGE 2007, London (11-14 June).
42. E. Monsen, S.I. Pedersen, **A. Bounaim**, M. Nickel, B. Savary, T. Brenna, B. Tjostheim, L. Sonneland, D. Hunt, P. Gillespie, and J. Thurmond, Quantitative 3D outcrop interpretation, 76th SEG Annual Meeting, New Orleans, October 2006.
43. E. Monsen, S.I. Pedersen, **A. Bounaim**, M. Nickel, B. Savary, T. Brenna, D. Hunt, and J. Thurmond, Quantitative 3D outcrop interpretation of fractured reservoirs, Penrose conference "Unlocking 3D earth systems", Durham, Sept 2006.
44. **A. Bounaim**, S. Holm, W. Chen, and Å. Ødegård, Simulation of the Breast Imaging CARI Technique by a FETD Approximation of Ultrasound Wave Propagation, in Proc. of World Congress on Ultrasonics, Paris, France, Sept 7-10, 2003.
45. **A. Bounaim**, S. Holm, W. Chen, and Å. Ødegård, Sensitivity of the Ultrasonic CARI Technique for Breast Tumor Detection Using a FETD Scheme, Ultrasonics International 2003, Granada, Spain, Jun 30-Jul 3, 2003.
46. **A. Bounaim**, S. Holm, W. Chen, Å. Ødegård, A. Tveito, and K. Thomenius, FETD Simulation of Wave Propagation Modeling the CARI Breast Sonography, in Proc. ICCSA2003, LNCS 2668, pp.705-714, International Conference on Computational Science and its Applications, Montreal, Canada, May 18-21, 2003.
47. W. Chen, S. Holm, **A. Bounaim**, Å. Ødegård, and A. Tveito, Frequency Decomposition Time-Domain Model of Broadband Frequency-Dependent Absorption, 9th Workshop of the Finite Element Method in Biomedical Engineering, Biomechanics and Related Fields, Ulm, Germany, June 18-19, 2002.
48. **A. Bounaim**, On the Optimal Control Problem of the Heat Equation: New Formulation of the Problem Using a Non-Overlapping Domain Decomposition Technique, Preprint, January 2002.
49. **A. Bounaim**, On the Solution of Optimal Control Problems Using Domain Decomposition Techniques, International Conference on Numerical Algorithms, (Abstract page 26), Marrakesh, Morocco, Oct 1-5, 2001.
50. L. Ingebrigtsen, **A. Bounaim**, H.P. Langtangen and A. Tveito. Moving Mesh Techniques for Fluid Flow Simulations, At the First SIAM-EMS Conference on Applied Mathematics in our Changing World, Berlin, Sep 2-6, 2001.

51. **A. Bounaim**, On the Use of iterative Schwarz Methods in the Solution of an Optimal Control Problem, N. Debit, M. Garbey, R. Hoppe, J. Periaux, D. Keyes, and Y. Kuznetsov Eds., in Proc. Of 13th Intern. Conf. on Domain Decomposition Methods, pp. 327-334, CIMNE UPS, Lyon, France, Oct. 9-12, 2000.
52. **A. Bounaim**, Utilisation des Algorithmes de Schwarz pour la Résolution d'un Problème de Contrôle Optimal, in Proc. Autumn School on Parallel and Distributed Computing (ParDi99), In Special Issue of Mathematics and Computing Dept. Publications of Oujda University, vol. 2(1), pp. 111-118, 2000 (in French).
53. **A. Bounaim**, Schwarz Iterative Methods and Optimal Control Problems, 31st Conference on Numerical Analysis, Aix - Les - Thermes, France, May 14-20, 1999.
54. **A. Bounaim**, A Non-Overlapping Domain Decomposition Method for a Time Dependent Optimal Control Problem, 11th International Conference on Domain Decomposition Methods, Greenwich, UK, Jul 20-24, 1998.
55. **A. Bounaim**, A Non-Overlapping Domain Decomposition Method for an Optimal Control Problem Governed by the Heat Equation, 30th Conference on Numerical Analysis, Arles, France, May 15-21, 1998.
56. **A. Bounaim**, A Lagrangian Approach to a Domain Decomposition Method for an Optimal Control Problem. Part I., Workshop on Domain Decomposition Methods and Communication in Parallel Computing (Journées Numériques de Besançon), Ballon d'Alsace, France, Sept 23-25, 1997.
57. **A. Bounaim**, A Lagrangian Approach to a Domain Decomposition Method for an Optimal Control Problem. Part II, 29th Conference on Numerical Analysis, Ardèche, France, May 12-18, 1997.
58. **A. Bounaim**, A Lagrangian Approach to a Domain Decomposition Method for an Optimal Control Problem, Bjørstad, Espedal, and Keyes Eds., in Proc. of 9th International Conference on Domain Decomposition Methods, pp. 283-289, Domain Decomposition Press, Ullensvang, Norway, Jun 3-8, 1996.

Invited Talks and Seminars

59. **Aicha Bounaim**, What Applied Mathematics Research Directions for the New Energy Era? Keynote Speaker, International Conference on Research in Applied Mathematics and Computer Science, Mar 26-27, 2021.
60. **Aicha Bounaim**, Cyber Security in Industry: Overview from Oil and Gas Sector, Invited Keynote Speaker, Virtual International Conference Cybersecurity and Recent Trends in Mathematical Modeling (Smm'2020), Jul 2020.

61. **Aicha Bounaim**, Applications of Mathematics to Real World Problems: Applied Research Perspective, Invited Keynote Speaker, Doctoriales of National School of Applied Sciences, Morocco, Jul 2020.
62. **Aicha Bounaim**, Invited seminar "Applied Mathematics and Applications to Environment, Medicine, and Oil and Gas – Review from my own experience", at Department of Modeling Simulation & Data Analysis, Mohamed VI Polytechnic university (UM6P), Ben Guerir, Morocco, April 23rd, 2019.
63. **A. Bounaim** for SSR, Automated fault mapping, extraction, and characterization, Invited talk at FORCE 2017 seminar – The Science Behind 2, Stavanger and Oslo, 9-10 May.
64. **A. Bounaim**, Invited Keynote Speaker to 5th Conference of Sciences of Engineering, Applied Mathematics and Applications of Mathematics to Medicine, Environment and Oil and Gas, Faculty of Sciences, University Hassan II, Casablanca, Morocco, April 22 2017. https://jsi17.sciencesconf.org/resource/page/id/1
65. W. Athmer and **A. Bounaim**, Automated Fault Extraction and Prediction – Novel Fault Attributes and Methods, FORCE seminar "The Science Behind", May 8, 2014, Norwegian Petroleum Directorate, Stavanger http://force.org/Seminars/Archive/2014/The-science-behind/.
66. **A. Bounaim**, Optimal Control Problems of Partial Differential Equations and Domain Decomposition Techniques, Invited seminar at Centre of Mathematics and Applications, University of Oslo, October 12th, 2004.
67. **A. Bounaim**, My First 40 days with Oil Drift Model, Group Seminar, Norwegian Meteorological Institute, Oceanography section, August 20th, 2004.
68. **A. Bounaim**, S. Holm, W. Chen, and Å. Ødegård, Mathematics in Medicine: Mathematical and Numerical Modeling of a Clinical Technique for Breast Cancer Detection, International Conference on Mathematics and its Applications, Department of Mathematics and Computer Science, Kuwait University, Kuwait, April 5-7, 2004.
69. W. Chen, **A. Bounaim,** X. Cai, S. Holm, A. Tveito, and Å. Ødegård, Mathematical and Numerical Modeling of Medical Ultrasound Wave Propagation, invited talk to MACSI-Workshop for Numerical Simulations for Ultrasound Imaging and Inversion, St. Georgen, Austria, pp 8-13, Nov. 21-22, 2003.

Research Reports

70. **Bounaim** and Bruce Hackett, Oil Drift Model at Met.no: C-code Version and New Capabilities. Technical report, The Norwegian Meteorological Institute, Oceanography section, October 2005.

71. **A. Bounaim**, S. Holm, W. Chen, and Å. Ødegård, Modified Fractional Derivative Model for the Attenuation in Human Soft Tissue: Finite element simulations using Diffpack, Simula Report 2004, Simula Research Laboratory, 2004.
72. **A. Bounaim**, S. Holm, W. Chen, and Å. Ødegård, Focusing of Ultrasonic Waves: Description and FE Simulations for a Breast Imaging Technique, Simula Report No 2003-13, Simula Research Laboratory, 2003.
73. **A. Bounaim**, S. Holm, W. Chen, and Å. Ødegård, Simulation of the CARI Technique for Breast Tumor Detection Using Ultrasound Wave Propagation, Simula Report No. 2002-11, Simula Research Laboratory, 2002.
74. **A. Bounaim**, Simulation of a Simple Attenuation Model in Breast Tumor Detection, Internal Report, Numerical and Mathematical Modeling of Medical Ultrasound Wave Propagation Project, January 2002.
75. **A. Bounaim**, On the Optimal Control Problem of the Heat Equation: New Formulation of the Problem Using a Non-Overlapping Domain Decomposition Technique, Preprint, January 2002.
76. **A. Bounaim**, Ultrasound Simulation in Medicine, Internal Report, Numerical and Mathematical Modeling of Medical Ultrasound Wave Propagation Project, December 2001.

Patents and Invention Disclosures

77. Patent Application No.: WO PCT/US2022/070688, Wiebke Athmer, **Aicha Bounaim**, Tom Jonsthovel, "Digital Platform for Collaboration Between Entities in Energy-Related Projects", Patent application filed 17/02/2022.
78. Le Guern P., M. Etchebes M., and **Bounaim A.**, Using Digital Exposed Analogues in Earth Modeling, Provisional Patent Application filed on May 23, 2017, under Serial Number 62/509,743, (Docket No. IS17.0555-US-PSP).
79. Jarle Haukaas**, Aicha Bounaim**, and Oddgeir Gramstad, Smooth Surface Wrapping of features in an imaged volume, US patent application, Apr 2017.
80. **Bounaim, A**., Ravndal O.R., and Haukås, J., Methods of analyzing seismic data: US Patent 9,341,728.

Invitation to workshops and awarded grants for travel and boarding during PhD and Postdoc

- Animated different virtual courses and workshops for students at different universities and Engineering schools in Morocco, Mai-Jul 2020:
    - Applications of Mathematics to Real World Problems: Career Research,
    - The Power of LinkedIn for Students,
    - Digital Networking Tips for Students in Pandemic Time (Virtual Roundtable),
    - Time Management for Internship.
- Invited Speaker at different conferences.
- Mathematical and Computational Modelling of Biological Systems, Texas Technical University, USA, November 6-9, 2003.
- 47th European Study Group with Industry (ESGI47), Univ. of Southern Denmark, Denmark, August 23-29, 2003.

Promoting Knowledge sharing and University relations

- During Pandemic time weekends in May, June and July 2020, I organized workshops and webinars for Moroccan students (Master, PhD, and Engineering) as support during the pandemic, in collaboration with Career center and Students associations:
    - Sharing my experience as Senior Research Scientist in industry, May 2021
    - The Power of LinkedIn for Students - Virtual workshop and demo session, June 2020.
    - Digital Networking Tips for Students in Pandemic Time, July 2020.
    - Time Management for Internship targeting Engineering students, July 2020.
- Invited Seminars at Ecole Normale Superieure de Casablanca (ENS), Renew contact with my Professor Hassan El Amri, Department of Applied Mathematics, Casablanca, Morocco, 2014 & 2016.
- Invited Seminar at Al-Akhawayn University, Faculty of Engineering, Ifrane, Morocco, Oct 2013.
- Invited Talk at Mundiapolis University, Faculty of Engineering, Oct 2013, Casablanca, Morocco.

Miscellaneous

- **A. Bounaim**, Invited seminar by Prof. Bjørn Jæger at University College of Molde, Molde, Norway, May 18th, 2004.
- **A. Bounaim**, Hvorfor er få unge interesserte i vitenskapelige fag? Semester project for 3rd level of Norwegian for International Students, Department of Linguistics, University of Oslo, May 2004 (in Norwegian).

- **A. Bounaim**, Marokko mellom hav og fjell, presentation for 1st level of Norwegian for International Students, Department of Linguistics, University of Oslo, September 2001 (in Norwegian).
- **A. Bounaim**, Science needs more Women: Choose Biomathematics, Presentation within Open Day at University of Oslo, March 11th, 2004.
- **A. Bounaim**, Emotion online, article of general interest published in Maroc-Hebdo, weekly Moroccan newspaper, 1997 (in French).