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Full Professor in Applied Mathematics

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*Mathematical Optimization, Operations research,
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Laboratory of Mathematics of Decision and Numerical Analysis.

Cheikh Anta Diop University (UCAD), Dakar, Senegal

COMPETENCES

- **Combinatorial Optimization-Neural Combinatorial Optimization**
- **Convex and Nonconvex Optimization (large-scale optimization)**
 - Senegalois algorithm, Branch&Bound, Cutting plane techniques, Interior-point methods, Benders decomposition, Column generation, Bilevel programming, DC (Difference of Convex functions) programming approaches, DCA (DC Algorithm).
- **Operations research**
 - Urban transportation networks, Road safety, Automated container terminals, Supply chain management, Land use, Air transport, Telecom networks, Finance, Machine Learning.
- **Numerical simulations**
 - Simulation technics and numerical methods for transport networks, PDE, finance, actuarial and data science.
 - Computer Software/Programming languages: GUROBI, IBM-ILOG CPLEX, IPOPT, R project, Python, GSL-GNU Scientific Library, GLPK, Scilab, Matlab, FreeFem++, C/C++.
 - Modelling Languages: VIA Senozon, MATSim, OPL Studio, AMPL, IBM-ILOG OPL Studio, Visual Studio Code.
 - Operating systems: MAC, Unix/Linux and Windows.

EDUCATION-ACADEMIC EXPERIENCE

11/2003-5/2007 **Ph.D. in Applied Mathematics**

Speciality Modelling, Optimization and Operations Research

Title Simulation and D.C. Optimization in combined transport networks. Industrial usage codes.

Advisors PHAM DINH Tao, Professor at INSA Rouen and LE THI Hoai An, Professor at Paul Verlaine university of Metz.

Place LMI INSA Rouen.

2002-2003 **M.Sc., Engineer Sciences**

National Institute of Applied Sciences-Rouen, France.

Advisor PHAM DINH Tao, Professor at INSA Rouen

2001-2002 **B.Sc., Specialised Sciences, Mathematics-Computer Science**

Faculty of Science and Technology, Fes, Morocco.

QUALIFICATIONS, RESEARCH ACTIVITIES, COLLABORATIONS AND TEACHING

- **Awards & Qualifications**

- Data crossing prize, Big-data Orange D4D Challenge Senegal 2014.
- Head of department. Department of decision mathematics, FASEG-UCAD.
- Curator of the EDMi doctoral school, UCAD.
- Ful Professor in Applied Mathematics, Cheikh Anta Diop University, September 2022.
- Professor in Applied Mathematics, Cheikh Anta Diop University, July 2015.
- Associate Professor in Applied Mathematics, Cheikh Anta Diop University, July 2009.
- Assistant Professor in Applied Mathematics, Cheikh Anta Diop University, April 2007.
- Ph.D., National Institute of Applied Sciences-Rouen (France), May 2007.
- M.Sc., with Distinction, Applied Mathematics, Faculty of Science and Technology, Fes, Morocco), 2003.

- **Postdoctoral training**

- 4/2010-6/2010 LMI INSA Rouen. New global approach for DC optimization, Postdoctoral funded by the AUF (University Agency of Francophonie).
- 9/2011-10/2011 LMI INSA Rouen. DC Programming and a new cutting plane approach, Postdoctoral funded by the french cooperation.

- **University degree**

- 07/2015 Training of Trainers in Actuarial for Africa.
Title Techniques of simulations and numerical methods for finance and actuarial.
Advisors Pr. Yahia Salhi and Pr. Alexis Bienvenüe
Collaborations Institute of financial sciences and insurance (ISFA) of the University of Claude Bernard-Lyon 1, France - University of Barcelona, Spain - University of Cheikh Anta Diop Dakar, Senegal - SCOR Corporate Foundation for Science.

- **Research interests**

- Convex and Nonconvex optimization (differentiable and non differentiable).
- Global optimization: theory, algorithms and applications (minimization of a concave function on a convex set via the cutting plane & Branch&Bound methods).
- DC (Difference of Convex functions) Programming, DCA (DC Algorithm) - Theory, algorithms and applications : duality in DC optimization, local and global optimality.
- Senegalois algorithm.
- Combinatorial optimization, dynamic optimization, network optimization, graph theory, finance, actuarial.
- Some interests to: PDE and Optimal mass transportation, Shape optimization, Data Science, Big data.

- **Short stays for collaborations or teaching**

- April 2025 Abomey-Calavi University & IMSP (Benin), African Mathematical Schools (AMS), intensive course on Optimizatiion in Machine Learning
- Nov. 2024 Heinz College of Information Systems and Public Policy, Carnegie Mellon University, Pittsburgh, PA, USA, to work with Prof. Peter Yun Zhang.
- Nov.-Dec. 2022 Heinz College of Information Systems and Public Policy, Carnegie Mellon University, Pittsburgh, PA, USA, to work with Prof. Peter Yun Zhang.
- May-June 2022 National School of Applied Sciences, Chouaib Doukkali University, El Jadida, Morocco, to work with Prof. Lamia Hammadi.
- November 2018 Department of Applied Mathematics, Universidade of Sao Paulo, Sao Paulo-SP, Brazil, to work with Prof. Vyacheslav Futorny and Prof. Antoine Laurain.
- Nov.-Dec. 2017 Department of Mathematics, University of California, Los Angeles (USA), to work with Prof. Wilfrid Gangbo.
- May 2017 - Present Montagnes University, Bangangte (Cameroon), intensive course on Monte-Carlo simulations and dynamic optimization.
- November 2015 School of Mathematics, Georgia Institute of Technology, Atlanta (USA), to work with Prof. Wilfrid Gangbo.

- December 2014 Laboratory of Informatics and Complex Systems, LaISC-CHArt University of Paris 8 (France), to work with Prof. Ivan Lavallée.
- October 2014 ISFA of Lyon-University of Barcelona, Lyon-Barcelona (France-Spain). Training of Trainers in Actuarial for Africa.
- February 2014 LIA-CERI University of Avignon, Avignon (France), to work with Dr. Serigne Gueye.
- June 2013 - Present IMSP University of Abomey Calavi, Porto-Novo (Benin), intensive course on combinatorial optimization and global optimization.
- May 2013 ISFA of Lyon-University of Barcelona, Lyon-Barcelona (France-Spain). Training of Trainers in Actuarial for Africa.
- February 2013 LIA-CERI University of Avignon (France), to work with Dr. Serigne Gueye.

- **Projects**

- PGMO project, Modeling and Robust Optimization of Seasonal Hydraulic Storage with Wavelets and Stochastic Optimization (MOSSHOOS). Gaspard Monge Program for Optimization, operations research, and their interactions with data science.
- ORTAD Project, Optimization of Transportation Networks and Sustainable Accessibility in Senegalese Cities. Minister of Scientific research of Senegal, FIRST project. Members: LMDAN (Dakar, Senegal) and LMA (Ziguinchor, Senegal).
- African Engineering and Technology Network (AFRETEC). 2023-02 to 2026-12 | Grant EU (Europe, NO), <https://engineering.cmu.edu/afretec/about/index.html>.
- OpenMod4Africa project, Open Modelling Toolbox for development of long-term pathways for the energy system in Africa, <https://openmod4africa.eu/about>.
- NLAGA (Non Linear Analysis, Geometry and Applications Project) project has been awarded by a five year grant of the SIMONS FOUNDATION (in progress), <http://nлага-simons.ucad.sn>.
- Modeling disasters and locating emergency facilities under the uncertainty of the emergency supply chain, ENSA El Jadida (Marocco), INSA Rouen (France) and UCAD (Senegal); awarded by a two year grant of the AUF.
- SDOAgorantic. SDO V1.0. Simulation Driven-Optimization version 1.0, 2014. Members: LIA of Avignon university and LMDAN of Cheikh Anta Diop university.
- Minister of Scientific research of Senegal, FIRST project. MACS: Modeling, Analysis and Scientific Calculus. Members: FASEG and FST.
- AUF research project, Stimulation and promotion of research. ORTRANS: Urban Network Transportation in Dakar and Niamey cities. Members: Cheikh Anta Diop university (Senegal), Avignon university (France) and Abdou Moumouni university (Niger).

- **Teaching activities**

- My current teaching duties include 200 hours of teaching per year (a lecture counts more than a tutorial session).
 - Lectures on Operations Research, 4th year, FASEG-UCAD, 2012-Present.
 - Tutorials on Database Management Systems, 4th year, FASEG-UCAD, 2007-Present.
- Lectures on Algorithmic and Data Structure, 1st year, ASEF-CREFDES, FASEG-UCAD, Senegal.
- Lectures on Network Optimization, 5th year, Faculty of Science and Technology-UCAD, Senegal.
- Lectures on Financial mathematics, 5th year, West African Center for Training and Banking Studies, Central Bank of West African States (BCEAO), Senegal.
- Lectures on Nonlinear and Global Optimization, 4th and 5th year, IMSP-Abomey Calavi university, Porto-Novo, Benin.
- Lectures on Monte-Carlo simulations and dynamic optimization, 4th year, University of Montagnes, Bangangte, Cameroon.

- Supervision activities

- Co-advisor with Prof. Bira Gueye & Prof. Abdoul Aziz Ndiaye of the thesis of Rokhaya Fall on "Robust modeling and optimization of mine blasts". The defense is supposedly due in fall 2027.
- Co-advisor with Prof. Pierre Mendy of the thesis of El Hadji Lamine Sokhna on Detection and classification of electrical distribution faults using data from smart meters. The defense is supposedly due in summer 2026.
- Co-advisor with Prof. Papa Ngom of the thesis of Pape Theodore Seye on "Spatio-temporal modeling and dynamics of intra-annual population redistribution in Senegal using satellite data". The defense is supposedly due in summer 2028.
- Co-advisor with Prof. El Hadji Deme & Dr. Souleymane Fofana of the thesis of Jean Jacques Roger FAYE on "Modeling and optimization of extreme risks in urban mobility: application to congestion, road safety and climate resilience of the city of Dakar". The defense is supposedly due in summer 2028.
- Co-advisor with Coumba Diallo of the thesis of Mohamed Fayaloui Hassani, on "Transport multimodal et optimisation de la localisation des activités (particulier, Dakar Dem Dikk, car rapide, aflu, BRT, TER, taxi)". The defense is supposedly due in fall 2026.
- Co-Advisor with Daouda N. Diatta of the thesis of Mouhamadou Sékou Diallo on "Optimization of planning and stock management in the cashew sector in Senegal". The defense was due in winter 2025.
- Co-advisor with Guy Degla of the thesis of Sita Karamoko Diallo on "Efficiency analysis of terminal containers in the Ports of Dakar and Cotonou using Data Envelopment Analysis and Bootstrap approaches". The defense was due in summer 2023.
- Advisor of the thesis of Mamadou Koné on "Network transportation and activity locations". The defense was due in November 19, 2020.
- Co-advisor with Aboubacar Marcos of the thesis of Oumar Sow on "Data Envelopment Analysis (DEA), linear presolving, bootstrapping approaches and efficiency analysis of a public transportation system". Defended in February 18, 2017.
- Co-advisor with Mamadou Baldé, Diaraf Seck and Roger M. Faye of the thesis of Cheikh B. Djiba (joint supervision between LTI and LMDAN) on "Urban network transportation, Dakar-Dem-Dikk case study". The defense was due in December 2012.
- Co-advisor with Diaraf Seck of the thesis of Coumba Diallo on "Mass transportation and air transportation at LSS airport". The defense was due in December 2012.
- Co-advisor with Idrissa Ly of the thesis of Fagueye Ndiaye on "Application of the p-median problem in school allocation, case of Dakar academy". The defense was due in November 2014.
- Stage advisor of André Dembélé, 3rd year thesis at IMSP Porto-Novo (from Benin), on "Telecommunications networks", from May 8 to August 8, 2016.
- Stage advisor of Jean Kouidi, 3rd year thesis at IMSP Porto-Novo (from Benin), on "Algorithms for asymptotically exact minimization in Karush-Kuhn-Turker methods", from July 1st to October 5, 2017.
- Stage advisor of Mohamed Kampo, 3rd year thesis at IMSP Porto-Novo (from Benin), on "Dynamic programming for load shedding in Benin", from July 1th to August 31, 2017.

PUBLICATIONS AND COMMUNICATIONS

Articles published on peer reviewed international journals

- Sokhna, E. H. L., Mendy, P., & Ndiaye, B. M. (2026). Wavelet approach and neural networks for co-movement between different phases of composite tension. *Journal of Applied Probability and Statistics*, 21(1), 65–86.
- Willane CT, Sylla PMDD, Thiam M, Ndiaye BM, Tall L, Idohou-Dossou N, et al. (2026) Optimizing nutritionally adequate food basket using linear programming in Niayes Households, Senegal. *PLoS One* 21(2): e0343156. <https://doi.org/10.1371/journal.pone.0343156>.
- Allali, Karam, Balde, Mouhamadou A. M. T., Ndiaye, Babacar M., An Optimal Control Study for a Two-Strain SEIR Epidemic Model With Saturated Incidence Rates and Treatment, *Discrete Dynamics in Nature and Society*, 2025, 8553106, 16 pages, 2025. <https://doi.org/10.1155/ddns/8553106>.

- HM Mboko, MAMT Balde, BM Ndiaye, Mobility-based Traffic Forecasting in a Multimodal Transport System, arXiv:2411.08052 [physics.soc-ph], <https://doi.org/10.48550/arXiv.2411.08052>.
- K Allali, MAMT Balde, BM Ndiaye, An optimal control study for a two-strain SEIR epidemic model with saturated incidence rates and treatment, arXiv:2404.17305 [qbio.PE], <https://doi.org/10.48550/arXiv.2404.17305>.
- Seydou Sore, Babacar M. Ndiaye, Yacouba Simporé, Lyapunov Exponential Stability of the Shallow Water Equations in Trapezoidal Channel, *Pan-Amer. J. Math.* 3 (2024), 9, doi: <https://doi.org/10.28919/cpr-pajm/3-9>.
- Karamoko S. Diallo, Guy A. Degla, Babacar M. Ndiaye, Pierre Mendy; DEA and bootstrap approaches for measuring efficiency in higher education sector: Evidence from Abomey-Calavi University, Benin. *AIP Conf. Proc.* 5 March 2024; 3034 (1): 020006. <https://doi.org/10.1063/5.0194556>.
- Hammadi, L. Raillani, H.; Ndiaye, B.M.; Aggoug, B.; El Ballouti, A.; Jidane, S.; Belyamani, L.; Souza de Cursi, E. Uncertainty Quantification for Epidemic Risk Management: Case of SARS-CoV-2 in Morocco. *Int. J. Environ. Res. Public Health* 2023, 20, 4102. <https://doi.org/10.3390/ijerph20054102>.
- Raillani. H, Hammadi, L, El Ballouti. A, Barbu. V. S, Ndiaye. B.M, de Cursi, E.S. (2023). Road Accidents Forecasting: An Uncertainty Quantification Model for Pre-Disaster Management in Moroccan Context. In: De Cursi, J. (eds) *Proceedings of the 6th International Symposium on Uncertainty Quantification and Stochastic Modelling. Uncertainties 2023. Lecture Notes in Mechanical Engineering.* Springer, Cham.
- Mendy Pierre, Ndiaye Babacar M., Seck Diaraf, Ly Idrissa, The Wade Formula and the oil price fluctuation: An Optimal Control Theory approach, arXiv:2211.13714 [math.OC], 24 Nov 2022.
- Simporé, Y., Ndiaye, B.M., Traoré, O., Seck, D. (2022). Null Controllability by Birth Control for a Population Dynamics Model. In: Seck, D., Kangni, K., Nang, P., Salomon Sambou, M. (eds) *Nonlinear Analysis, Geometry and Applications*, pp 29–56. *Trends in Mathematics.* Birkhäuser, Cham. https://doi.org/10.1007/978-3-031-04616-2_2.
- Ndiaye, F., Ndiaye, B.M. (2022). Uniqueness and Stability in an Inverse Problem for Electromagnetic Forming of a Metal Jet. In: Seck, D., Kangni, K., Nang, P., Salomon Sambou, M. (eds) *Nonlinear Analysis, Geometry and Applications. Trends in Mathematics.* Birkhäuser, Cham. https://doi.org/10.1007/978-3-031-04616-2_11.
- M. Barry, C. Diallo and B. M. Ndiaye, Optimal mass transportation for noise minimization problem around an airport, 2022, 11th International Symposium on Signal, Image, Video and Communications (ISIVC), IEEE Xplore, 2022, pp.1-6, ISBN:978-1-6654-8724-5, doi: 10.1109/ISIVC54825.2022.9800744.
- K.S. Diallo, P. Mendy, G. Degla, B.M. Ndiaye, Data Envelopment Analysis and Bootstrap Approaches for Efficiency Measure of the Autonomous Port of Dakar, *Journal of Mathematics Research*, Vol. 14, No. 4 (2022), p.51-64, DOI:10.5539/jmr.v14n4p51.
- Amadou S. Diallo, Steeven B. Affognon, Babacar M. Ndiaye, Philip Ngare, Stochastic optimal control and simulations with application to the cashew nut sector in Senegal, *Results in Applied Mathematics*, Volume 14, 2022, 100272, ISSN 2590-0374, <https://doi.org/10.1016/j.rinam.2022.100272>.
- Mouhamadou A.M.T. Baldé, Coura Baldé, Babacar M. Ndiaye, Impact studies of nationwide measures COVID-19 anti-pandemic: compartmental model and machine learning, *Commun. Math. Biol. Neurosci.*, 2020 (2020), Article ID 68.
- Koné M., Ndiaye B.M., Seck D. (2020) Optimal Mass Transport for Activities Location Problem. In: Seck D., Kangni K., Nang P., Salomon Sambou M. (eds) *Nonlinear Analysis, Geometry and Applications. Trends in Mathematics.* Birkhäuser, Cham. https://doi.org/10.1007/978-3-030-57336-2_3.

- M.M. Fall, B.M. Ndiaye, O.Seydi, D. Seck, Analysis of COVID-19 evolution in Senegal: impact of health care capacity, arXiv:2011.06278 [q-bio.PE], 12 Nov 2020.
- M. Diouf, B.M. Ndiaye, Logistic growth model and modeling of factors for community case transmission, arXiv:2011.02766 [q-bio.PE], 5 Nov 2020.
- B.M. Ndiaye, M.A.M.T. Balde, D. Seck, Visualization and machine learning for forecasting of COVID-19 in Senegal, arXiv:2008.03135 [q-bio.PE], Aug 2020.
- V.M. Ndiaye, S.O. Sarr, B.M. Ndiaye, Impact of contamination factors on the COVID-19 evolution in Senegal, arXiv:2006.16326 [q-bio.PE], 29 Jun 2020.
- Mouhamadou A.M.T. Balde, Coura Balde, Babacar M. Ndiaye, Impact studies of nationwide measures COVID-19 anti-pandemic: compartmental model and machine learning, arXiv:2005.08395 [q-bio.PE], 17 May 2020.
- Babacar M. Ndiaye, Lena Tendeng, Diaraf Seck, Comparative prediction of confirmed cases with COVID-19 pandemic by machine learning, deterministic and stochastic SIR models, arXiv:2004.13489v1 [q-bio.PE] 24 Apr 2020.
- Babacar M. Ndiaye, Lena Tendeng, Diaraf Seck, Analysis of the COVID-19 pandemic by SIR model and machine learning technics for forecasting, arXiv:2004.01574v1 [q-bio.PE], 3 Apr 2020.
- Baldé, Mouhamadou A. M. T. and Gueye, Serigne and Ndiaye, Babacar M., A greedy evolutionary hybridization algorithm for the optimal network and quadratic assignment problem. *Oper Res Int J* (2020). <https://doi.org/10.1007/s12351-020-00549-7>.
- Dembélé A., Ndiaye B.M., Ouorou A., Degla G. (2020) A Triple Stabilized Bundle Method for Constrained Nonconvex Nonsmooth Optimization. In: Le Thi H., Le H., Pham Dinh T., Nguyen N. (eds) *Advanced Computational Methods for Knowledge Engineering. ICCSAMA 2019. Advances in Intelligent Systems and Computing*, vol 1121. Springer, Cham, pp 75-87.
- Essessinou, R. A., Degla, G., & Ndiaye, B. M. (2019). *From Two to One Index Isomorphism in Optimization Program for Quarterly Disaggregation of Annual Times Series*. *Journal of Advances in Mathematics and Computer Science*, 34(1&2), 1-15. <https://doi.org/10.9734/jamcs/2019/v34i1&230199>.
- Koudi J., Ndiaye B.M., Degla G. (2019) *Asymptotically Exact Minimizations for Optimal Management of Public Finances*. In: Le Thi H., Le H., Pham Dinh T. (eds) *Optimization of Complex Systems: Theory, Models, Algorithms and Applications*. WCGO 2019. *Advances in Intelligent Systems and Computing*, vol 991, pp 831-841. Springer, Cham. https://doi.org/10.1007/978-3-030-21803-4_83.
- M. Koné, M.A.M.T. Baldé, B.M.Ndiaye, *A Dichotomic Algorithm for Transportation Network and Land Use Problem*. Vol. 11, No. 1 (2019), p.42-56, *Journal of Mathematics Research*. doi:10.5539/jmr.v11n1p42.
- Ndiaye F., Ndiaye B.M. , Ndiaye M, Seck D. and Ly I.(2018). *Conformal transformation method for irrigation Dirichlet problem*. In *A Collection of Papers in Mathematics and Related Sciences, a festschrift in honour of the late Galaye Dia* (Editors : Seydi H., Lo G.S. and Diakhaby A.). Spas Editions, Euclid Series Book, (Doi : 10.16929/sbs/2018.100). pp. 265–285. Doi : 10.16929/sbs/2018.100-03-05.
- Kampo, M., Ndiaye, B.M. & Degla, G. (2018). *Dynamic Programming for an Optimal and Equitable Public Load Shedding Schedule*. *Croatian Operational Research Review*, 9 (2), 211-221. <https://doi.org/10.17535/crorr.2018.0016>.
- K. Jean, G. Degla, B.M. Ndiaye and M.K. Traore *Algorithms for asymptotically exact minimizations in Karush-Kuhn-Tucker methods*. *Journal of Mathematics Research*, Vol. 10, No. 2, p.36-54, April 2018. DOI:10.5539/jmr.v10n2p36.
- O. Sow, A. Oukil, B.M. Ndiaye, and A. Marcos, *Efficiency analysis of public transportation subunits using DEA and Bootstrap approaches. Dakar Dem Dikk case study*. *Journal of Mathematics Research*, Vol. 8, No. 6, p.114-127, 2016.

- M.A.M.T. Baldé and B.M. Ndiaye, *A New Heuristic Method for Transportation Network and Land Use Problem*, Journal of Mathematics Research, Vol. 8, No. 3, p.94-111, June 2016. DOI:10.5539/jmr.v8n3p94.
- S. Gueye, B.M. Ndiaye, D. Josselin, M. Poss, R.M. Faye, P. Michelon, C. Genre-Grandpierre, and F. Ciari, *Using mobile phone data for Spatial Planning simulation and Optimization Technologies (SPOT)*, Data for Development Challenge Senegal, Book of Abstracts: Scientific Papers, T15, pp.516-534, May 2015.
- F. Ndiaye, I. Ly, B.M. Ndiaye and D. Seck, *Reconstruction method for conformal mapping in two dimensions*, Advanced Modeling and Optimization, Volume 16, Number 1, p.143-163, 2014.
- Babacar M. Ndiaye, Ivan Lavallée, Diaraf Seck, *Solving worrying simplex's instances in polynomial time*, Mongolian Mathematical Journal, Vol. 17, pp.4-26, 2013.
- Lavallée I., Ndiaye B.M. and Seck D., *A specifically computational approach for linear programming*, Studia Informatica Universalis, Vol. 10, No. 2, pp. 5-43, 2013.
- Ndiaye, B.M., Le Thi, H.A. and Pham Dinh, T. (2012) *Single straddle carrier routing problem in port container terminals: mathematical model and solving approaches*, Int. J. Intelligent Information and Database Systems, Vol. 6, No. 6, pp. 532-554.
- C. Djiba, M. Baldé, B. Ndiaye, R. Faye and D. Seck, *Optimizing Dead Mileage in Urban Bus Routes. Dakar Dem Dikk Case Study*, Journal of Transportation Technologies, Vol. 2 No. 3, 2012, pp. 241-247.
- L. Ndiaye, B. Ndiaye, P. Mendy and D. Seck, *Numerical Approach of Network Problems in Optimal Mass Transportation*, Applied Mathematics, Vol. 3 No. 5, 2012, pp. 457-466.
- C. Djiba, M. Baldé, B. Ndiaye, R. Faye and D. Seck, *Breakdown Mechanic Location Problem*, Applied Mathematics, Vol. 3 No. 5, 2012, pp. 467-472.
- C. Diallo, B. Ndiaye and D. Seck, *Scheduling Aircraft Landings at LSS Airport*, American Journal of Operations Research, Vol. 2 No. 2, 2012, pp. 235-241.
- F. Ndiaye, B. Ndiaye and I. Ly, *Application of the p-Median Problem in School Allocation*, American Journal of Operations Research, Vol. 2 No. 2, 2012, pp. 253-259.
- Ndiaye B.M., Le Thi H.A., Pham D.T. and Niu Y.S., *DC Programming and DCA for Large scale Two-dimensional Packing Problems*. Intelligent Information and Database Systems, ACIIDS 2012 Proceedings Part II, pp. 321-330, Lecture Notes in Artificial Intelligence, Springer.
- Lavallée I., Ndiaye B.M. and Seck D., *A new way in linear programming*. LISS 2011, Proceedings of the 1st International Conference on Logistics, Informatics and Services Sciences, Logistics Management Vol. 2, pp. 220-227.
- Ndiaye B.M., Le Thi H.A. and Pham D.T., *Single Straddle Carrier Routing Problem in Port Container Terminals: Mathematical Model and Solving Approaches*. MCO 2008, CCIS 14, pp. 21-31, 2008. Springer-Verlag Berlin Heidelberg 2008.
- Le Thi H.A., Ndiaye B.M. and Pham D.T., *Solving a multimodal transport problem by DCA*. IEEE Conference Proceedings in Computing & Communication Technologies, RIVF 2008.

International Conferences with acts and reading committee

- Fourth Edition of the NLAGA Biennial International Research Symposium. University of Gaston Berger, Senegal, December 02-05, 2025.
- ECEMP 2025, European Energy Transition and Society: moving towards Implementation, 16-17 October 2025, Bruxelles, Belgique.
- Capacity-Building Workshop on Enhancing Sustainable Urban, Accessibility and Mobility in Senegal through AI, Cheikh Anta Diop University, Dakar, June 11-13, 2025.
- Fifth International conference on Modelling, Computation and Optimization in Information Systems and Management Sciences (MCO 2025), June 4-6, 2025, Metz, France.

- Stochastic Modeling and Uncertainty Quantification (SMUQ), July 8-9, 2024, Valencia, Spain.
- OpenMod4Africa Training Session and Consortium Meeting, Universidad Pontificia Comillas - Engineering School, June 16- 27, 2024, Madrid, Spain.
- The 6th International Symposium on Uncertainty Quantification and Stochastic Modelling (Uncertainties 2023), Fortaleza, Brazil, July 30–August 4, 2023.
- Ninth International Conference on Modeling, Simulation and Applied Optimization, 26–28 April 2023, Marrakesh, Morocco.
- The 6th International Congress of the Moroccan Society of Emergency Medicine, October 20-22, 2022, Rabat, Morocco.
- Healthcare Training and Innovation Conference HTIC 2023, Faculty of Medicine and Pharmacy, Casablanca, Morocco, February 23-25, 2023.
- The 9th International Conference on Modeling, Simulation and Applied Optimization, ICMSAO'23, April 26–28, 2023, Marrakech, Morocco.
- ORPA-AFROS Inter-disciplinary Summer School, OASIS'2022, 4-7 July 2022, Operations Research (OR) and Artificial Intelligence (AI). 2022 Online edition.
- The 11th International Symposium on Signal, Image, Video and Communications ISIVC 2022, National School of Applied Sciences, University of Chouaib Doukkali, Morocco, on May 18-20, 2022.
- Second Edition of the NLAGA Biennial International Research Symposium. University Assane Seck of Ziguinchor, Senegal. January 26-29, 2022.
- 50th Annual Conference of the Operations Research Society of South Africa (ORSSA) in collaboration with AFROS (the African Federation of Operations Research Societies). September 13-15, 2021, Cape Town, South Africa.
- International Conference LMA-NLAGA 2021, Hôtel Hibiscus, Cap Skirring, Ziguinchor, Sénégal. July 26-30, 2021.
- 3rd edition of the Stochastic and Applications, Research and Training (START) workshop scheduled at AIMS Ghana, February 16-22, 2020, Accra, Ghana.
- International Conference on Computer Science, Applied Mathematics and Applications (ICCSAMA 2019), December 19-20, 2019, Hanoi, Vietnam.
- Symposium of the young senegalese researchers in pure and applied mathematics, December 16-19, 2019, Saly-Mbour, Senegal.
- Africa Transport Policy Program (SSATP), Positioning Africa for a Sustainable Post-2020 Road Safety Agenda, 25-29 Novembre 2019, Victoria Falls - Zimbabwe.
- AWMO 2019, African Workshop on Mathematical Optimisation, University of Zululand, 11-15 November 2019, KwaDlangeZwa, South Africa.
- 6th World Congress on Global Optimization (WCGO 2019), July 8-10, 2019, Metz, France.
- NLAGA Biennial International Research Symposium, June 24-28, 2019, University Cheikh Anta Diop, Dakar, Senegal.
- Math Day For Development, Friday, March 15, 2019, UNESCO, Paris, France.
- Transforming Transportation 2019, New mobility solutions, challenges, and opportunities, Washington DC, USA, January 17-18, 2019.
- First Data Science School (DSS), December 06th to 14th, 2018 in Dangbo, Porto-Novo, Benin.
- Ndiaye F., Ndiaye B.M., Seck D. *On solvability of type Pompeiu-Schiffer's conjectures and consequences*. International Congress of Mathematicians, Riocentro, Rio de Janeiro, August 01-09, 2018.
- Africa Transport Policy Program (SSATP). Annual Meeting and associated Experiences' sharing Events In Abuja, Nigeria, July 2-6, 2018.

- M.A.M.T. Baldé, B.M. Ndiaye, S. Gueye, *A greedy evolutionary hybridization algorithm for the Optimal Network and Quadratic Assignment Problem*. The 2018 International Conference of the African Federation of Operational Research Societies (AFROS 2018), 2nd - 4th July, 2018, Tunis, Tunisia.
- M. Koné, B.M. Ndiaye, *Senegaulois Algorithm for Transportation Network and Land Use Problem*. The 2018 International Conference of the African Federation of Operational Research Societies (AFROS 2018), 2nd - 4th July, 2018, Tunis, Tunisia.
- B.M. Ndiaye, *Applications of mathematics in transportation*. The 1st Symposium on Applications of Mathematics in Engineering and Science (CAMIS), February 21-22, 2018, Bambey-Senegal.
- Transforming Transportation 2018, Realizing Sustainable Mobility for All in the Digital Era, Washington DC, USA, January 11-12, 2018.
- Ndiaye B.M., *DC programming: theory and applications*, 16h conference of the "Groupe Interafricain de Recherche en Analyse, Géométrie et Applications (GIRAGA)", IMSP Porto-Novo, Benin, December 18-23, 2017.
- Ndiaye B.M., *Operations research in transport networks*, ROAD Workshop on "Operations research applications and decision making process in business", ESATIC Abidjan, Ivory-Coast, April 25-26, 2017.
- Ndiaye B.M., DFG-AIMS Workshop on Shape optimization, homogenization and control. AIMS Senegal, Mbour, Senegal, March 13-16, 2017.
- Ndiaye B.M., Autumn School Algorithmic Optimization at Trier University, Germany, September 19-22, 2016.
- Ndiaye B.M., CIMPA research school on Geometrical Analysis of Optimal Shapes, UCAD Dakar, Senegal, May 2-12, 2016.
- Ndiaye B.M., 2nd Workshop on Seismic Metamaterials: Introduction to the Mathematics and the Physics of Metamaterials, UCAD Dakar, Senegal, May 16-21, 2016.
- Ndiaye B.M., *Using mobile phone data for Spatial Planning simulation and Optimization Technologies*. CIMAB 2016, 1st International Conference of Mathematics in Baol on "Mathematics and innovating world", Bambey, Senegal, Nov. 29-Dec. 1st, 2016.
- Sow O., Ndiaye B.M. and Marcos A., *Data Envelopment Analysis with presolve as a decision making tool. Dakar Dem Dikk case study*. 6th Operations Research Practice in Africa ORPA 2015, Algiers, Algeria, April 19-23, 2015.
- Baldé M.A.M.T, Ndiaye B.M. and Gueye S., *A new Heuristic method for Transportation Network and Land Use Problem*. 6th Operations Research Practice in Africa ORPA 2015, Algiers, Algeria, April 19-23, 2015.
- S. Gueye, B.M. Ndiaye, D. Josselin, M. Poss, R.M. Faye, P. Michelon, C. Genre-Grandpierre, and F. Ciari, *Using mobile phone data for Spatial Planning simulation and Optimization Technologies (SPOT)*. NetMob 2015, MIT Media Lab, Cambridge MA, USA, April 05-11, 2015.
- Ndiaye, B.M., *SPOT*, Workshop on "Mathematical sciences for understanding real world problems in Africa: Georgia Tech meets Senegal", AIMS Senegal Center, Mbour, 18-21 May, 2015.
- Ndiaye B.M., Lavallée I., Seck D. *The Senegaulois Algorithm. A new way to solve linear programming problem*. SEOUL ICM 2014, International Congress of Mathematicians, Coex, Seoul, Korea, August 13-21, 2014.
- Ndiaye B.M., ICTP-NLAGA-Project School in Dynamicsl Systems and Ergodic Theory, AIMS-Senegal, Mbour, June 4-14, 2014.
- Ndiaye B.M., WS-2013 ORTRANS, Network Transportation and Land Use Problem, Dakar, November 19-20, 2013.
- Ndiaye B.M., Lavallée I., Seck D., *Polynomial solving of exponential cases of the simplex*, 14th Conference of ROADEF, Troyes, February 13-15, 2013.

- Ndiaye B.M., CIMPA School on Geometric structures and control theory, Dakar, May 07-19, 2012.
- Ndiaye B.M., Le Thi H.A., Pham D.T. and Niu Y.S., *DC Programming and DCA for Large-scale Two-dimensional Packing Problems*. ACIIDS 2012, 4th Asian Conference, Kaohsiung, Taiwan, March 19-21, 2012.
- Ndiaye B.M., *Global Optimization*. School of Operations Research: Operations Research as an Asset for Development. Porto-Novo, November 14-19, 2011.
- Ndiaye B.M., Le Thi H.A., Pham Dinh T., Niu Y.S., *DC Programming and Cutting planes for Berth Scheduling in port container terminal*. AFG11, Toulouse, September 19-23, 2011.
- Lavallée I., Ndiaye B.M., Seck D., *A new way in linear programming*. LISS 11, First International Conference on Logistics, Informatics and Service Science. Beijing, China, June 8-11, 2011.
- Ndiaye B.M., Le Thi H.A., Pham Dinh T., Niu Y.S. *DC Programming and New Cutting planes for the Scheduling of Handling Equipments*. Optimization and Learning: Theory, Algorithms and Applications(WS'11). Metz, May 23-24, 2011.
- Ndiaye B.M., CIMPA School on Modelisation, nonlinear systems and applications. Dakar, April 5-15, 2011.
- Ndiaye B.M., Le Thi H.A., Pham Dinh T., *DC Programming and DCA for AGV Dispatching*. Optimization and Learning: Theory, Algorithms and Applications. Metz, June 17-18, 2010.
- Djiba C.B., Balde M., Ndiaye B.M., *Optimizing Dead Mileage in Urban Bus Routes: Case of Dakar-Dem-Dikk*. Operational Research Practice in Africa Group, ORPA2010, Dakar, March 18-20, 2010.
- Diallo C., Ndiaye B.M., Seck D., *Simulation and Optimization for Air Transportation*. Operational Research Practice in Africa Group, ORPA2010, Dakar, March 18-20, 2010.
- Ndiaye L., Ndiaye B.M., Seck D., *Mass Transportation Theory for Network Optimization*. Operational Research Practice in Africa Group, ORPA2010, Dakar, March 18-20, 2010.
- Ndiaye B.M., Pham D.T., Le Thi H.A., *DC Programming Approach for Berth Scheduling*, EURO Conference. Bonn, July 5 - 8, 2009.
- Ndiaye B.M., Le Thi H.A., Pham D.T., *Single Straddle Carrier Routing Problem in Port Container Terminals: Mathematical Model and Solving Approaches*. MCO'08, Modelling Computation and Optimization, Metz, France-Luxembourg.
- RIVF 2008, University of Science-Vietnam National University, July 13-17, 2008, Ho Chi Minh City, Vietnam.
- Ndiaye B.M., Pham D.T., Le Thi H.A., *DC Programming and DCA for Automated Guided Vehicles Dispatching in Port Container Terminals*. NCP07, Rouen, Dec. 17-21, 2007.
- Ndiaye B.M., Le Thi H.A., Pham D.T., *DC Programming and DCA for Dispatching AGV in Port Container Terminals*. FRANCORO V/ROADEF, Grenoble, February 20-23, 2007.
- Ndiaye B.M., Pham D.T., Le Thi H.A., *DC Programming and DCA for a Pooled Dispatching Strategy for Automated Guided Vehicles in Port Container Terminals*. Operations Research, OR2006, Karlsruhe, Sept. 6-8, 2006.
- Ndiaye B.M., Pham D.T., Le Thi H.A., *DC Programming and DCA for the scheduling of handling equipments in a Rapid Transshipment Shunting Yard*. Computational Management Science, CMS06, Amsterdam, May 17-18, 2006.
- Ndiaye B.M., Pham D.T., Le Thi H.A., *Modelling and Simulation of the container assignment problem in a Rapid Transshipment Shunting Yard by D.C. Programming and DCA approaches*. 7th Conference of ROADEF, Lille, February 6-8, 2006.

- Ndiaye B.M., Pham D.T., Le Thi H.A., *DC Programming and DCA for the scheduling of handling equipments in a Rapid Transshipment Shunting Yard*. JPOC3 Avignon, June 1-2, 2006.
- Ndiaye B.M., Pham D.T., Le Thi H.A., Second Polyedral and Combinatorial Optimization Journey, JPOC2, Marseille, June 2005.
- Ndiaye B.M., Pham D.T., Spring school on Transportation, JOPT Centre for Research on Transportation (CRT) of Montreal and GERAD, HEC Montreal, May 2004.
Ndiaye B.M., Pham D.T., Le Thi H.A., MODE of SMAI in Havre, MODE-SMAI, Le Havre, March 2004.