

DR. ALASSANE SY

Professor at the University Alioune Diop of Bambey, Senegal.

PERSONAL DATA

- **Place and Date of Birth** : Tiguere Yene (Senegal), 15 october 1976.
- **Phone** : (00221) · 77 567 · 58 · 09
- **Email** : alassane.sy@uadb.edu.sn
- **Attached Institution** : University Alioune Diop of Bambey, Senegal

MATHEMATICAL INTERESTS

Modeling, Non linear PDE, Shape and topological Optimization, Numerical analysis and simulations; control and optimal control theory.

EDUCATION

Ph.D in Applied Mathematics Defended in April 2011.

- **Title of the thesis**: Some numerical aspects in shape and topological optimization.
- **Institution(s)**: Université Cheikh Anta Diop of Dakar (Senegal)
- **Advisor(s)**: Diaraf SECK (UCAD-Senegal)

Thesis in Applied Mathematics Defended in February 2008.

- **Title of the thesis**: Studies of pollutant transfer in porous media and image processing by topological optimisation.
- **Institution(s)**: Université Cheikh Anta Diop of Dakar (Senegal)
- **Advisor(s)**: Diaraf SECK (UCAD-Senegal)

Master degree in Applied Mathematics 2004 - 2006.

- **Institution(s)**: Université Cheikh Anta Diop of Dakar (Senegal)
- **Advisor(s)**: Diaraf SECK (UCAD-Senegal)

ACADEMIC POSITIONS

University Alioune Diop de Bambey (UADB) July 2015 - - - - -
Professor *Bambey, Senegal*

- Member of the Laboratory ICT and Applied Mathematics. UADB
- Head of research team "Non Linear Analysis and Geometry" UADB

University Alioune Diop de Bambey (UADB) January 2008 - June 2015
Assistant Professor *Bambey, Senegal*

- Member of the Laboratory "Mathématiques de la Décision et Analyse Numérique" UCAD.

RESEARCH ACTIVITIES

Ph.D Students (co)advised at Univ. Cheikh Anata DIOP Dakar Thesis in progress
Advisor or Co-advisor UCAD-UADB

- **Aliou SECK** Coupling shape and topological derivative for Navier-Stokes equations. In progress
- **Mouhamadou M. SOW** Ondelettes theory: Application in images processing. In progress.
- **Ouseynou MBAYE**. co-advisor: **M.L. BA** and **G. CAMARA**. In progress.
- **Serigne DIOUF** The p-Laplacian operator: Application in Image processing. In progress.
- **Mouhamadou Baidy DIA** On Topological Optimization Phononics, photonics and pollution. **DIA's** Ph.D is funded by the **NLAGA AMP Simons Grant** and have been started in December 2015. Co-advisor **I. FAYE**.
- **Zein Elimine** "Analysis and Controllability of transportation equation" co-advisor **I. FAYE**

Master Degree Students advised at Univ. Alioune Diop of Bambey January 2015 - Present
advisor Bambey, Senegal

- **Mr. Aliou Seck** Shape and topological optimisation for the Stationnary Navier Stokes equation. November 2016.
- **Mr. Malick FALL** Résultats d'existence en optimisation de formes géométriques: Applications aux problèmes de Dirichlet et de Neumann. June 2017.
- **Mr. Diamal Ahmad FAHAD** Quelques aspects de la théorie du contrôle : Application à l'équation de la chaleur: June 2017.
- **Mr. Mouhamadou M. DIOP** .Résolution des problème d'image 2D par les méthode d'optimisation topologique: May 2017.
- **Mr. Lat Souk NGOM** Le P-laplacien: theorie et quelques applications. UADB Novembre 2018.

Invitation(s) to International Laboratories for Collaborations February to April 2012
Visiting Fellow

- **Basque Center for Applied Mathematics**. In Bilbao (Espagne)

Participation to Relevant International Workshops and Conferences

- Topological optimisation with the p-laplacian operator and an application in image processing. 1ère Journées Internationales de Mathématiques de Ziguinchor , Ziguinchor du Sénégal, Mai 2008, (Communication).
- Some Numerical Aspects in Shape and topological optimization, REUNION SCIENTIFIQUE de l'UMI 209 IRD & UPMC UMMISCO, au Centre France-Nord de l'IRD, Bondy FRANCE: 22-25 fvrier 2010 (Communication)
- Nouvelle Méthode Numrique en Optimisation des Structures Elastiques, 2me Journées Internationales de Mathématiques de Ziguinchor : 24-28 Mai 2010 (communication) Ziguinchor du Sénégal
- Structural optimization with a coupling between shape and topological gradient with fictitious domain approach, Ecole/Confrence sur les Rcents Dveloppements en Analyse Non linaires et Applications, Cotonou (BENIN) du 28 Juin au 10 Juillet 2010 (confrence.)
- Fictitious domain approach and level-sets method for the Stokes problem, Basque Center for Applied Mathematics (Espagne) 04 Fvrier 2012.
- Numerical control of the discrete monopole problem, Basque Center for Applied Mathematics (Espagne) 24 Avril 2012.
- Contrôle numérique d'un problème de transmission de phase : le modèle de monopole : Journées Internationales de Mathématiques du Ziginchor du 10 au 12 Dcembre 2012. (Communication) Ziguinchor du Sénégal.

- Identification of the free boundary of the American option in financial enterprise; Mathematical sciences for understanding real world problems in Africa: Georgia Tech meets Senegal, AIMS Senegal 18-21 May, 2015.
- Participation to a International Workshop on Mathematical Sciences for Understanding Real World Problems in Africa : Georgia Tech Meets Senegal, in May 2015, at AIMS Senegal.
- Participation to a International Workshop Fourier Integral operator, in September 2015, Ouagadougou (Burkina Fasso)
- Participation to the NLAGA-ICTP International School "Analyse géométrie de formes optimale" in may 2016 at UCAD, Senegal.
- Participation to the school "Géométrie des objets invisibles" in may 2016 at UCAD, Senegal.
- Invited presentator at the DFG-AIMS Workshop on " Shape optimization, homogenization and control " from 13 to 16 March 2017 in Mbour, Senegal

RELEVANT PUBLICATIONS

1. I. FAYE, **A. SY** and D. SECK, Topological Optimization and pollution in porous media. pp: 209-237, in Mathematical Modeling, Simulation, Visualization and e-Learning, Springer-Verlag Berlin Heidelberg 2008.
2. **A. SY** and D. SECK, Topological optimization with the p-Laplacian operator: and an application in image processing. Boundary Value Problem, Volume 2009, article 986813. Hindawi Publishing Corporation: 20 pages.
3. **A. SY**, and Y. RENARD, Structural optimization with a coupling between shape and topological gradient with fictitious domain approach, Far East Journal of Mathematical Sciences, 47 (1), 2010, pp: 30-50.
4. Kh. FALL , **A. SY** and D. SECK, Topological Optimization for a Controlled Dirichlet Problem in Polygonal Domain, Journal of numerical Mathematic and Stochastics , Vol. 2, No1, (2010) pp. 12-33.
5. M. NGOM, **A. SY** I. FAYE and D. SECK, Study phononic and photonic crystal problems by topological optimization method., Int. Journal of Math. Analysis, , Vol. 5, No15, (2011) pp. 725-74.
6. **A. SY** FICTITIOUS DOMAIN APPROACH AND LEVEL-SETS METHOD FOR THE STOKES PROBLEM, International Journal of Mathematical Archive - 2(12), 2011, pp: 1-8
7. M. NDIAYE, **A. SY** and D. SECK, Location Problems of an interface with two layer stationary Navier-Stokes Systems, Theoretical Mathematics and applications , Vol. 3, No2, (2012) pp. 1-21.
8. **A. SY**, Numerical control of a discrete phase transition model: the monopole Problem; Advances in Differential e Equations and Control Process; Volume 12 No1, 2013; pp 1-22.
9. **A. SY** ETUDE D'UNE METHODE D'ANALYSE ASYMPTOTIQUE EN OPTIMISATION DE FORME TOPOLOGIQUE ET APPLICATIONS, Editions Universitaires Européennes 2014.
10. L. NDIAYE, **A. SY** and D. SECK, Pollution in porous media: Non permanent case: Journal of Computations & Modelling, vol. 2, no. 1, 2012, 549-564.
11. L. NDIAYE, Mb. NDIAYE, **A. SY** and D. SECK, Pollution transfer as an optimal mass transportation problem, Journal of Mathematics Research , Vol. 8, No6, December 2016 pp. 58 - 77.
12. L. NDIAYE, Mb. NDIAYE, **A. SY** and D. SECK, Pollution transfer as an optimal mass transportation problem, Journal of Mathematics Research , Vol. 8, No6, December 2016 pp. 58 - 77.
13. A. SECK, M. NDIAYE, **A. SY** and D. SECK, Numerical Solution of the 2-D Incompressible Non Stationary Navier-Stokes Equations by Adapted Projection Method, To appear in

14. A. SECK, A. SY and D. SECK, Asymptotic Analysis of a shape Functional in Incompressible Navier-Stokes Flows, Submitted.

RELEVANT NETWORKING AND COLLABORATION ACTIVITIES

- . **Member of the IMU** (International Mathematical Union) since June 2015.
- . **Member of the CEA-MITIC Project** funded by the World Bank, since June 2015.
- . **Member of the NLAGA-Project** funded by the AMP-Simons grant, since April 2013.

ADMINISTRATIVE POSITIONS AND RELEVANT FORMATION

Director of Quality assurance System of Alioune Diop University of Bambey , since January 2014.

Certification of Interne Quality assurance, DAAD and Germany Conference of Rector Nov. 2016.

Expet of Externe Quality Assurance in high education of CAMES and ANAQ

TECHNICAL STRENGTHS

Matlab, Getfem++, Fluent, IPOpt, Freefem

LANGUAGE SKILLS

- . **French:** Proficient user.
- . **English:** Effective operational proficiency
- . **Wolof and Peulh** Mother tongue