

## Curriculum Vitae



Name: Slah SAHMIM

Date of Birth: September 29, 1976

Nationality: Tunisian

Telephone number: 0096635897414

E-mail: sahmim\_slah@yahoo.fr, ssahmim@kfu.edu.sa

Professional Address: Math Department, College of Science, King Faisal University, kingdom of Saudi Arabian .

I am currently an assistant professor at the College of Science, King Faisal University . I received my PhD in Applied Mathematics from University Paris 13 under the supervision of Prof. Fayssal BENKHALDOUN.

### POSITIONS:

- ✓ September 2013 : Assistant professor at the College of Science, King Faisal University
- ✓ September 2012 : Assistant professor at the College of Science and Arts, Sharoura
- ✓ September 2007: Assistant professor at the Institute of Computer Sciences and Communication Techniques of Hammam Sousse, Tunisia.
- ✓ September 2006: Assistant professor at the Higher Institute of Computer and Multimedia of Sfax, Tunisia.
- ✓ September 2004-August 2005: Temporary Attachment to Education and Research at the University of Paris 13, France.

### PH. D. THESIS:

- ✓ Title : "A finite volume scheme based on matrix sign devoted to non homogenous systems".
- ✓ Advisor : Fayssal BENKHALDOUN.
- ✓ Defended : June 2005 at University of Paris XIII, France.
- ✓ Jury : François Alouges (referee), Claude Basdvant (President), Fayssal Benkhaloun (Advisor), Hervé Guillard (referee), Anela Kumbaro, Laure Quivy.
- ✓ Mention : « très honorable ».
- ✓ Abstract : This thesis is devoted to the analysis, the application and the two-dimensional extension, of a new finite volumes scheme (SRNH) proposed recently for a class of nonhomogeneous systems. The stability analysis of the scheme, first in the scalar case then in the case of systems of conservation laws, leads to a new formulation of the scheme which is based on the sign of the Jacobian matrix of the system under study. For Shallow Water equation with slope source term, one shows formally that the scheme SRNHS preserves the exact C-property introduced in the context of equilibrium schemes, by Bermúdez and Vázquez. The 1D and 2D numerical results, in particular in the case of a dam break over a step, show how much the scheme is really efficient. For two phase flows, nonhyperbolicity regions could appear, and the eigenvalues of the Jacobian matrix could become complex. It is shown that for weak nonhyperbolic configurations, one can calculate the sign of the Jacobian matrix using the algorithm of Newton-Schultz. For stiffer configurations, where the preceding method is no more adequate, one can use the method of density perturbation. In both cases, the numerical tests show that one approaches the exact solution of the Ransom problem with a high degree of accuracy, and that one preserves the stability of the calculations even on a grid of a relatively high degree of refinement.

## **EDUCATION:**

|              |                                                                                          |
|--------------|------------------------------------------------------------------------------------------|
| 2000 – 2001: | Master's graduate diploma in Numerical analysis At University of Paris VI, France.       |
| 1998 – 2000: | High school graduate diploma in mathematics Faculty of Sciences of Tunis, Tunisia.       |
| 1996 – 1998: | Diploma of the first cycle in mathematics physics Faculty of Sciences of Tunis, Tunisia. |
| 1998 – 1999: | Baccalauréat.                                                                            |

## PUBLICATIONS

H. Aydi, A. Felhi, S. Sahmim,  $\alpha$  -CONTRACTIVE MAPPINGS ON RECTANGULAR b-METRIC SPACES AND AN APPLICATION TO INTEGRAL EQUATIONS, Journal of Mathematical Analysis, Volume 9 Issue 3 (2018), Pages 47-60.

- H. Aydi, A. Felhi, S. Sahmim, Ćirić-Berinde fixed point theorems for multi-valued mappings on  $\alpha$  – complete metric-like spaces, Filomat, 31:12 (2017) 3727-3740.
- H. Aydi, A. Felhi, S. Sahmim,  $\alpha$  -CONTRACTIVE MAPPINGS ON RECTANGULAR b-METRIC SPACES AND AN APPLICATION TO INTEGRAL EQUATIONS, Journal of Mathematical Analysis, Volume 9 Issue 3 (2018), Pages 47-60.
- H. Aydi, A. Felhi, S. Sahmim, Ćirić-Berinde fixed point theorems for multi-valued mappings on  $\alpha$  – complete metric-like spaces, Filomat, 31:12 (2017) 3727-3740.
- H. Aydi, A. Felhi, S. Sahmim, A Suzuki point theorem for generalized multivalued mappings on metric-like spaces, Glasnik Math. 52 (72) (2017), 147 -161.
- H. Aydi, A. Felhi, S. Sahmim, Common fixed points via implicit contractions on b-metric-like spaces, J. Nonlinear Sci. Appl. 10 (4) (2017) 1524-1537.
- Ahmed Al-Rawashed, Hassen Aydi, Abdelbasset Felhi, Slah Sahmim, " On common fixed points for  $\alpha$  – F-contractions and applications, Journal of Nonlinear Science and Applications 9(5):3445–3458 · May 2016.
- Erdal KARAPINAR, Hassen Aydi, Abdelbasset Felhi, Slah Sahmim, " Hausdorff Metric-Like, generalized Nadler's Fixed Point Theorem on Metric-Like Spaces and application", Accepted in MISKOLC Mathematical Notes.
- Hassen Aydi, Abdelbasset Felhi, Slah Sahmim, " Ulam-Hyers stability and well-posedness of fixed point problems for  $\alpha$ - $\lambda$ -contractions on quasi b-metric spaces,"Fixed Point Theory and Applications 2016:1(1) · December 2016. DOI: 10.1186/s13663-015-0491-2
- Hassen Aydi, Abdelbasset Felhi, Slah Sahmim, " Fixed points of multivalued nonself almost contractions in metric-like spaces, Math Sci (2015) 9:103–108 DOI 10.1007/s40096-015-0156-7.
- HASSEN AYDI, ABDELBASSET FELHI AND SLAH SAHMIM, " COMMON FIXED POINTS IN RECTANGULAR b-METRIC SPACES USING (E.A) PROPERTY", J. Adv. Math. Stud. Vol. 8(2015), No. 2, 159-169 <http://journal.fairpartners.ro>
- N. Izem, F. Benkhaldoun, S. Sahmim, M. Seaid, M. Wakrim, "A new composite scheme for two-layer shallow water flows with shocks, accepted in Journal of Applied Mathematics and Computing (July 2013).
- Benkhaldoun, S. Sahmim, M. Seaid "Mathematical development and verification of a finite volume model for morphodynamic low applications" Accepted for publication in Advances in Applied Mathematics and Mechanics (2011).
- F. Benkhaldoun, S. Sahmim, M. Seaid "A two- dimensional finite volume morphodynamic model on unstructured grids" International Journal for Numerical Methods in fluids. Volume 63, Issue 11, pages 1296-1327 (2010).
- F. Benkhaldoun, S. Sahmim, M. Seaid "Solution of the sediment transport equations using a finite volume method based on sign matrix". Journal SIAM J. Sci. Comp. Vol 31, pp: 2866-2889 (2009).

- S. Sahmim, F. Benkhaldoun and F. Alcrudo “A sign matrix based for non-homogeneous PDE's with an analysis of the convergence phenomenon”. Journal of Computational Physics 226 (2007) 1753- 1783.
- S. Sahmim, F. Benkhaldoun, “ Schéma SRNHS - Analyse et Application d'un schéma aux volumes finis dédié aux systèmes non homogènes ”, ARIMA. Volume 5, pages 302-316 (2006).
- S. Sahmim, F. Benkhaldoun, “ Schéma SRNHS - Analyse et Application d'un schéma aux volumes finis dédié aux systèmes non homogènes ”, ARIMA. Volume 5, pages 302-316 (2006).

## SELECTED CONFERENCES, SCHOOLS AND WORKSHOPS ATTENDED

- N. Izem, M. Wakrim, S. Sahmim and F. Benkhaldoun, Le schéma SNRH pour la résolution du problème de Saint Venant Bi-couhes, communication accepted for publication MAMERN 11, 3rd International Conference on Approximation Methods and numerical Modeling in Environment and Natural Resources.
- S. Sahmim, F. Benkhaldoun and S. Seaid “Mathematical development and verification of a finite volume model for morphodynamic flow applications” Numerical Methods for Interaction between Sediments and Water, LAGA- Paris 13 Nord University- Villetaneuse , September 20 – 24, 2010.
- F. Benkhaldoun, S. Sahmim , M. Seaid, « Adaptive Numerical Simulation of Sediment Transport in Shallow Water Flows », Seminario Internacional Sobre Matematica Aplicada y su Repercusion en la Sociedad Actual November 17, (2008) , Madrid (Invited)
- S. Sahmim, F. Benkhaldoun and F. Alcrudo “Efficiency of finite volume solvers for inhomogeneous systems Marrakech world conference on differential equations and applications, June 2006.
- F. Benkhaldoun, S. Sahmim, “SRNH scheme applied to the simulation of two phase problems”, Colloquium Topical Problems of Fluid Dynamics, Prague, February 2006.
- S. Sahmim, F. Benkhaldoun, “ Schéma SRNHS - Analyse et Application d'un schéma aux volumes finis dédié aux systèmes non homogènes ”, ARIMA. Volume 5, pages 302-316 (2006).
- S. Sahmim, F. Benkhaldoun and F. Alcrudo,” A finite volume solver based on matrix sign for non homogeneous systems”, FVCA4, Hermes Science Publishing, ISBN 1 905209 48 7, pp 471-482, (2005).
- S. Sahmim, F. Benkhaldoun ,” Analyse et Application d'un schéma aux volumes finis dédié au systèmes non homogènes ”, actes du colloque Tendances pour les Applications des Mathématiques, Tunisia, April 2005, pp 348-353.
- S. Sahmim, F. Benkhaldoun, “A finite volume scheme using matrix sign applied to the simulation of non-homogeneous system”, Trends in Numerical and physical modelling for industrial multiphase flows, Cargese, September 2005.
- S. Sahmim, F. Benkhaldoun, “NHRS scheme and Matrix sign applied to non homogeneous systems”, Ecole de printemps, Numerical Simulation of Complex and Multiphase Flows, IGESA Porquerolles, 18-22 April 2005.

## TEACHING:

- 2015-2016: Numerical analysis, General Mathematics
- 2016-2017: Numerical analysis, Geometric transformation, Applied Mathematics, General Mathematics
- 2015-2016: Numerical analysis, Logic & proof techniques, Geometric transformation
- 2014-2015: Numerical analysis, Logic & proof techniques, Geometric transformation, calculus 1, Applied mathematics
- 2013-2014: Numerical analysis, Geometric transformation, calculus 1, Applied mathematics
- 2010-2011: Finite volume methods and laws conservations (Master), Analysis (Engineer), Algebra and analysis (LMW 1).
- 2009-2010: Algebra and analysis (LMW 1), Numerical analysis (Engineer), Analysis (Engineer).
- 2008-2009: Algebra and analysis (LR1), Optimization (L3 Mathematics), Numerical analysis (Engineer).
- 2007-2008: Algebra and analysis (LR1), Numerical analysis (Engineer).
- 2006-2007: Probability and statistics (LMW2), Algebra and analysis (LR1).
- 2005-2006: signal processing (GTR2).

#### **LANGUAGES:**

Arab: Written and spoken (Good)

French: Written and spoken (Good)

English: Written and spoken (Average)