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First name : Mokhtar

Last name : HAFAYED

Personal : Birth date: February 15, 1976, Biskra, Algeria, Married.
Langage : Arab, French, English.

Education

1. **HDR, in Mathematics**, 2012. University Med. Khider Biskra,
2. **Ph.D in Mathematics**, Option : Probability, 2009. University Med. Khider Biskra, Algeria. Ph.D, Thesis: ''Gradients généralisés et contrôle stochastique''
3. **Magister in Mathématics**, Option : RO, 2001. University Mohamed Boudiaf, M'sila, Algeria.
4. **D.E.S** Diplôme des Etudes Supérieur en Mathématiques, 1998, University Mohamed Boudiaf, M'sila, Algeria.

Research Interests

- Probability and stochastic process
- Stochastic optimal control & Singular control
- Near-optimal stochastic control
- Stochastic differential equations
- Mean-field control problems and applications to finance.

Selected Publications

- **(33)** Samira Boukaf & Lina Guenane & **Mokhtar Hafayed,** Optimal continuous-singular control of stochastic McKean-Vlasov system in Wasserstein space of probability measures, IJDSDE 265175, **Accepté,** **International Journal of Dynamical Systems and Differential Equations . 2021**

- (**32)** Ravi Deepa & Palanisamy Muthukumar & **Mokhtar Hafayed**, Optimal control of non-zero sum game mean-field delayed Markov regime-switching forward-backward system with L évy processes, Accept, ***Optimal Control Applications and Methods Wiley, 2021.*** DOI: 10.1002/oca.2665.

- (**31)** Imad Eddine Lakhdari & Hakima Miloudi & **Mokhtar Hafayed** : Stochastic maximum principle for partially observed optimal control problems of general McKean-Vlasov differential equations, ***Bulletin of the Iranian Mathematical Society, Springer (2020),*** DOI: 10.1007/s41980-020-00426-1

- (**30)** Lina Guenane **& Mokhtar Hafayed**, & Shahlar Meherrem & Syed Abbas : On optimal solutions of general continuous-singular stochastic control problem of McKean-Vlasov type**. Mathematical Methods in the Applied Sciences , Wiley DOI: 10.1002/mma.6392. (2020),** Volume 43, Issue 10, Pages 6498-6516.

- (**29) Mokhtar Hafayed**, & Shahlar Meherrem , On optimal control of mean-field stochastic systems driven by Teugels martingales via derivative with respect to measures, ***International journal of control, DOI:10.1080/00207179.2018.1489148, Vol 93 (5), pp 1053-1062. (2020)***

- *(28)* Shahlar Meherrem, **Mokhtar Hafayed**, Maximum principle for optimal control of McKean-Vlasov FBSDEs with Lévy process via the differentiability with respect to probability law, ***Optimal Control Applications and Methods DOI:*** **10.1002/oca.2490 2019. (40) 499-516.**

- *(27)* Lakshman Mahto ; Syed Abbas, **Mokhtar Hafayed**, Hari Srivastava : Approximate Controllability of Sub-Diffusion Equation with Impulsive Condition, ***Mathematics 2019, 7 Doi.*** **10.3390/math7020190. 2019**

- (26) Shahlar Meherrem, & **Mokhtar Hafayed**, & Syed Abbas: On Peng's type maximum principle for optimal control of mean-field stochastic differential equations with jump processes, ***International Journal of Modelling, Identification and Control. DOI: 10.1504/IJMIC.2018.10014194.(2019)***

- (**25**) **Mokhtar Hafayed**, & Shahlar Meherrem & Saban Eren & Deniz H Guoclu,: On optimal singular control problem for general McKean-Vlasov differential equations: Necessary and sufficient optimality conditions, ***Optimal Control Applications and Methods DOI:10.1002/oca.2403. Optim Control Appl Meth 2018; 39 , pp:1202--1219.(2018)***

- (**24**) Shahlar Meherrem & **Mokhtar Hafayed** & Deniz H. Gucoglu & Saban Eren A general characterization of the stochastic optimal combined control of mean field stochastic systems with application, International journal of dynamics and Control, Doi ***Int. J. Dynam. Control, Springer, DOI 10.1007/s40435-017-0323-9. Volume 6, Issue 2, pp 873--880 , (2018)***

- (**23**) **Mokhtar Hafayed**, & Shahlar Meherrem & Deniz H Guoclu, & Saban Eren Variational principle for stochastic singular control of mean-field Lévy-forward-backward system driven by orthogonal Teugels martingales with application ***International Journal of Modelling, Identification and Control, DOI: 10.1504/IJMIC.2017.10006366, Vol 28, Issue 2, pp 97--113. (2017).***

- (**22**) **Mokhtar Hafayed**, & Ghebouli Messaoud & Samira Boukaf & Yan Shi: Partial information optimal control of mean-field forward-backward stochastic system driven by Teugels martingales with applications (2016) DOI 10.1016/j.neucom. 2016.03.002. ***Neurocomputing, Vol 200 pages 11--21 (2016).***

- (**21**) **Mokhtar Hafayed**, & Samira Boukaf, & Yan Shi, & Shahlar Meherrem.: A McKean-Vlasov optimal mixed regular-singular control problem, for nonlinear stochastic systems with Poisson jump processes, (2016) ***Neurocomputing. Doi 10.1016/j.neucom.2015.11.082, Volume 182, 19, pages 133-144 (2016).***

- (**20**) **Mokhtar Hafayed**, & Abdelmadjid Abba & Syed Abbas: On partial-information optimal singular control problem for mean-field stochastic differential equations driven byTeugels martingales measures, ID: 1079648

DOI:10.1080/00207179.2015.1079648 ***Internat. J. Control , 89 (2016), no. 2, 397--410. 2016.***

❖ (**19**) **Mokhtar Hafayed**, & Abdelmadjid Abba & Samira Boukaf: On Zhou's maximum principle for near-optimal control of mean-field forward-backward stochastic systems with jumps and its applications , ***International Journal of Modelling, Identification and Control".25 (1), 1-16, (2016).***

❖ (**18**) Swati Tyagi, Syed Abbas, **Mokhtar Hafayed**: Global Mittag-Leffler stability of complex valued fractional-order neural network with discrete and distributed delays, **Rendiconti del *Circolo Matematico di Palermo (1952-), Springer . Doi 10.1007/s12215-016-0248-8, (2016).***

❖ (**17**) Boukaf Samira & **Mokhtar Hafayed**, & Ghebouli Messaoud: A study on optimal control problem with ε-{λ}-error bound for stochastic systems with application to linear quadratic problem , ***International Journal of Dynamics and Contro , Springer DOI: 10.1007/s40435-015-0178-x. Volume 5, Issue 2, pp 297--305, (2017)***

❖ (**16**) **Mokhtar Hafayed** & Syed Abbas & Abdelmadjid Abba: On Mean-field Partial Information Maximum Principle of Optimal Control for Stochastic Systems with Lévy Processes, ***Journal of Optimizations Theory and Applications. Springer , J Optim Theory Appl (2015) 167:1051-1069 (2015).***

❖ (**15**) **Mokhtar Hafayed**, & Moufida Tabet & Samira Boukaf: Mean-field maximum principle for optimal control of forward-backward stochastic systems with jumps and its application to mean-variance portfolio problem, ***Communication in Mathematics and Statistics, Doi: 10.1007/s40304-015-0054-1, Springer, Volume 3, Issue 2, pp 163-186 (2015)***

❖ (**14**) **Mokhtar Hafayed**, Petr Veverka, Syed Abbas: On Near-optimal Necessary and Sufficient Conditions for Forward-Backward Stochastic Systems with Jumps, with ***Applications to Finance , Applications of Mathematics, Springer, 59(4), 407-440 (2014).***

❖ (**13**) **Mokhtar Hafayed**: Singular mean-field optimal control for forward-backward stochastic systems and applications to finance, ***International Journal of Dynamics and Control, Springer, Doi: 10.1007/s40435-014-0080-y, 2(4), 542-554, (2014).***

❖ (**12**) Syed Abbas, Lakshman Mahto, Angelo Favini, **Mokhtar Hafayed**: Dynamical Study of Fractional Model of Allelopathic Stimulatory Phytoplankton Species, *Differential Equation and Dynamical Systems, Springer, Doi 10.1007/s12591-014 -0219-5 Volume 24, Issue 3, pp 267-280 (2016).*

- (**11**) Syed Abbas, Lakshman Mahto, **Mokhtar Hafayed**, Adel. M.Alimi: Asymptotic almost automorphic solutions of impulsive neural network with almost automorphic coefficients ***Neurocomputing, Elsevier, Vol (142), 326--334 (2014).***

- (**10**) Syed Abbas, Chen Ki Yang , **Mokhtar Hafayed**: Stepanov type weighted pseudo almost automorphic sequences and their applications to difference equations ***Nonlinear Studies, Vol 21(1), 99-111 (2014).***

- **(09**) **Mokhtar Hafayed**: A Mean-field Necessary and Sufficient Conditions for Optimal Singular Stochastic Control ***. Communications in Mathematics and Statistics, Springer, Doi: 10.1007/s40304-014-0023-0, 1(4), 417-435 (2014).***

- (**08**) **Mokhtar Hafayed**, Abdelmadjid Abba, Abbas Syed: On mean-field stochastic maximum principle for near-optimal controls for poisson jump diffusion with applications. ***International Journal of Dynamics and Control, Springer Doi: 10.1007/s40435-013-0040-y, Vol 2(3), 262-284 (2014).***

- (**07**) **Mokhtar Hafayed**: A mean-field maximum principle for optimal control of forward-backward stochastic differential equations with poisson jump processes. International Journal of Dynamics and Control, Doi: 10.1007/s40435-013-0027-8, ***Int. J. Dynam. Control, Springer, 1(4) 300-315 (2013).***

- (**06**) **Mokhtar Hafayed** , Syed Abbas: On Stochastic Near-optimal Singular Controls for Jumps Diffusions: Necessary and Sufficient Conditions , ***Journal of Dynamical and Control Systems, Springer 19(4), 503-517, (2013).***

- (**05**) **Mokhtar Hafayed**, Syed Abbas: On Near-optimal Mean-field stochastic singular controls: necessary and sufficient conditions for near-optimality. ***Journal of Optimization Theory and Applications, Springer, Doi 10.1007/s10975-013-0361-1,.Vol 160, 778--808 (2014).***

- (**04**) **Mokhtar Hafayed** , Syed Abbas, Petr Veverka : On necessary and sufficient conditions for near-optimal singular stochastic controls, ***Optimization Letters, Springer, Optim. Lett. (7)5, 949-966, (2013).***

- (**03**) **Mokhtar Hafayed** , Petr Veverka , Syed Abbas: On Maximum Principle of Near-optimality for Diffusions with Jumps, with Application to Consumption-Investment

Problem, ***Differential Equation and Dynamical Systems, Springer, Vol 20(2), pp, 111-125, (2012).***

- (**02**) **Mokhtar Hafayed** , Syed Abbas: Generalized Gradient in Weak Maximum Principle With Non-differentiable Drift . ***International Journal of Evolution Equations IJEE, Vol 6, N°1, pp., 17-29, (2012).***

- (01) **Mokhtar Hafayed**: Filippov Approach in Stochastic Maximum Principle without Dfferentiability Assumptions . ***Electonic Journal of Differential Equations, Vol 2010, 1-13, (2010).***

Ph.D Students supervised

1. *Abba Abdelmadjid*, Univesity Mohamed Khider, Biskra 2016, Ph.D
2. *Tabet Moufida*, Univesity Mohamed Khider, Biskra 2016 , Ph.D
3. *Samira Boukaf*, Univesity Mohamed Khider, Biskra 2017, Ph.D
4. *Gheboulli Messaoud*, University Bachir Elibrahimi, Bourdj bou Arerridj, *in progress*
5. *Abada Nour Elhouda*, *in progress*
6. *Lina Guenane*, University Med Khider, Biskra, *in progress*
7. *Hakima Miloudi*, University Med Khider, Biskra, *in progress*

Professional Activities and Community Engagement

- **Serves as an *Editorial Board Member* of the following scientific journal:**
  International Journal of Modeling , Identification and Control IJMIC from 2017- 2020
- **Serves as an active *reviewer* for international journals, such as**

1. International Journal of Control, Taylor & Francis
2. Automatica,
3. Appl. Math. J. Chinese Univ, Springer
4. Bulletin of the London Mathematical, Oxford Journal.
5. IEEE Transactions on Automatic Control, IEEE
6. IEEE Transactions on Industrial Electronics IEEE
7. IET Control Theory & Control IEEE
8. Journal of Industrial and Management Optimization, AIMS
9. International Journal of Modeling , Identification and Control IJMIC
10. International Journal of Dynamics and control IJDY, Springer
11. Applied Mathematics and Optimizations, Springer
12. Optimal Control, Applications and Methods , Wiley

Conference Proceedings

- A new lower bound on the total weighted completition time for the one machine sheduling problem (a)" Journées des Mathématiques Appliquées. JMA2000. Université de Blida, le 13-14/11/2000.
- A new lower bound on the total weighted completition time for the one machine sheduling problem (b)" . 2ièm Rencontré International de Mathématiques et ses Appliquations. RAMA1. Université de M'sila, le 19-21/11/2000
- Generalized gradients and stochastic control". Journées Internationales de Mathématiques Appliquées de SAFI, JMASA2000. Université de Cadi Ayyad, Maroc, le 25-27/06/2008 .
- Generalized gradients in stochastic optimal control" . V-th International Workshop on Probability and stochastic analysis. Biskra, le 17-18/12/2008.
- Filippov's Approach in Stochastic Optimal Control". Conférences Internationale de Mathématiques et Applications CIMA09, Annaba, le 26-28-/10/2009.
- Filippov Approach in Necessary Conditions of Optimal Stochastic Control" , International Workshop in Mutivariate Risks and copulas ,Biskra , le 12-15/04/2010.
- On generalized gradient in weak maximum principle with non differentiable drift" , Workshop International sur les Mathématiques Appliquées et la modilisation "WIMAM'2011" Guelma , le 25-26/09/2011.
- On near-optimal stochastic singular controls: Necessary and sufficient conditions for near-optimality", Workshop de Probabilités et Statistiques à la mémoire du Seid Bahlali , Biskra 29-30, Jan 2013.

Participations and organisations

- Head of Mathematics Department , University Med Khider, Biskra 2018-2020
- Member of **CSD** , Scientific Committee of Mathematic Department, 2012-2016, 2018-
- Member of **CSF** , Scientific Committee of Faculty FSESNV , 2018- 2020
- Participation in School of CIMPA-Unesco, Tunisie, Probabilités et physiques Mathématiques, Mahdia, Tunisie, 02-08/08/2004.
- Participation in oganisation of "3-th International Workshop on Processus Aléatoires", Laboratoire de Mathématiques Appliquées, Biskra, 26-27/02/2005. Dec 2004.
- Participation in oganisation of Journées de Statistiques Appliquées" Laboratoire de Mathématiques Appliquées, Biskra, 26-27/02/2005.
- Participation in oganisation of "4- th International Workshop on Processus Aléatoires", Biskra, Déc /2006.
- Participation in oganisation "Journées de Statistiques Théorique et Appliquée (JSTA)", Laboratoire de Mathématiques Appliquées, Biskra, 21-22/02/2007.

- Participation in oganisation "V-th International Workshop on Probability and Stochastic Analysis ", Biskra 17-18/12/2008.
- Participation in oganisation of " International Workshop on in Mutivariate Risks and copulas", Biskra , le 12-15/04/2010.

Reaserch Grants and Awards

- ✓ **PRFU** Algerian project, 2018-2021 ‘’ *Contrôle optimal stochastique pour des systèmes de type McKean-Vlasov : théorie, méthodes et applications* ‘’ Grant **C00L03UN070120180003, Algerié.**
- ✓ **CNEPRU** 2014-2016, Grant N° B01420130137. Title: "*Contrôle stochastique optimal et presque optimal et leurs applications*."
- ✓ **PNR**: Projet National de Recherches Title "*Sur certain aspects des équations différentielles stochastiques et leur contrôle optimal*": 08/u07/857, 2011-2013.
- ✓ **CNEPRU** 2008/2011/2013.

Prof. Mokhtar Hafayed le 15/07/2020