

Department of Mathematics
The Hashemite University, Zarqa, Jordan

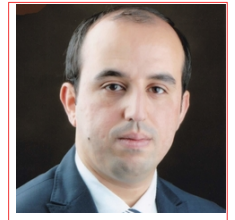
+962(07)90143117

+962(05)3903333-4549

+962(05)3903349

b.alhdaibat@hu.edu.jo

<http://staff.hu.edu.jo/alhdaibat>



Dr. Bashir Al-Hdaibat

Education

- 2012 – 2015 **Ph.D. in Mathematics**, *Department of Applied Mathematics, Computer Science and Statistics, Ghent University, Belgium.*
- **Thesis:** Computational Dynamical Systems Analysis
 - **Supervisors:** Prof. Dr. Willy Govaerts
Prof. Dr. Yuri A. Kuznetsov (Utrecht University, The Netherlands)
- 2012 – 2015 **Doctoral Training Programme**, *Doctoral School of Natural Sciences, Ghent University, Belgium.*
- 2009 – 2011 **M.Sc. in Mathematics**, *Department of Mathematics, Al al-Bayt University, Jordan.*
- **Thesis:** Bifurcations in the Dynamical System and in the Solutions of Parametrized Equations
 - **Supervisor:** Dr. Saleem Al-Ashhab
- 2002 – 2006 **B.Sc. in Mathematics**, *Department of Mathematics, The Hashemite University, Jordan.*

Research Interests

Dynamical Systems, bifurcation theory, chaos theory, perturbation methods and nonlinear dynamics in biology and economics.

Current Research Activities

My current research activities are centered around developing numerical strategies to analyze global (homoclinic and homoclinic tangencies) bifurcation in ODEs and maps, develop and create algorithms; and implement them into the MATLAB continuation package MatCont.

Experience

- 2021 – Now **Associated Professor**, *Department of Mathematics, The Hashemite University, Jordan.*
- 2016 – 2021 **Assistant Professor**, *Department of Mathematics, The Hashemite University, Jordan.*
- 2012 – 2015 **Ph.D. Researcher**, *Ghent University, Belgium.*
- 2011 – 2012 **Math Teacher**, *Ministry of Education, Kuwait.*
- 2006 – 2011 **Math Teacher**, *Ministry of Education, Jordan.*

Teaching Experience

Taught multiple undergraduate courses in mathematics:

Numerical Analysis (2+1), Numerical Methods, Partial Differential Equations (1), Special Topics (Bifurcation Theory), Ordinary Differential Equations (2+1), Linear Algebra (1), Calculus (1+2+3), Discrete Mathematics.

Computer Skills

- Programming & Mathematical Packages:

MATLAB, C++, Python, Maple, MuPAD & Mathematica

Advanced

- Dynamical Systems Software:

MatCont, AUTO, DDE-BITFTOOL, DynPac & PyDSTool

Participation in Major Committees

- Member of the University Council as Faculty of Science representative (Sep. 2016 - Sep. 2017).
- Member of the Council of the Faculty of Science as the representative of the Mathematics Department (Sep. 2018 - Sep. 2019).
- Member of the Cultural and Scientific Committee of the Faculty of Science (Sep. 2017 - Sep. 2019)
- Chairman of Scientific Research and Graduate Studies Committee of the Mathematics Department (Sep. 2017 - Sep. 2019).

Thesis Co-supervise

- A study of local bifurcation in two dimensional space of the Gray-Scott kinetic model, (2019). Al al-Bayt University, Master thesis by Nisreen Al-Masaeed

Master Thesis Committee Defense Membership

- A study of the solution of difference equations using the Mathematica formulas, (2020). Al al-Bayt University, Master thesis by Abdel-khaleq Adnan Amodi.
- A study of the solution of difference equations using the Pochhammer symbol, (2018). Al al-Bayt University, Master thesis by Gadeer Mashaqbeh.
- A study of the solutions of rational systems of difference equations, (2017). Al al-Bayt University, Master thesis by Batool Yaqub.

Conferences & Workshops

- *New asymptotics of homoclinic orbits near Bogdanov-Takens bifurcation point* (May 2015). **Paper presented** at SIAM conference on applications of dynamical systems, Utah, US.
- *Chaos and periodic solutions in a dynamic monopoly model* (May 2015). **Paper presented** at the 8th CHAOS 2015 International Conference, Paris, France.
- *Werkgemeinschaft Scientific Computing (WSC) Spring meeting 2015* (May 2015), University of Antwerp, Belgium.
- *Practical initialization of homoclinic orbits from a Bogdanov-Takens point* (November 2014). **Poster presented** at the 3rd International Conference on Complex Dynamical Systems and Their Applications: New Mathematical Concepts and Applications in Life Sciences, Ankara, Turkey.
- *The 18th Czech-Slovak Workshop on Discrete Dynamical Systems* (September 2014), Silesian University in Opava, Czech Republic.

- *Specialist workshop on Numerical methods in the study of bifurcations of discrete and continuous dynamical systems* (May 2014), Hasselt University, Belgium.

Publications

- Mohammad A. Safi, **Bashir Al-Hdaibat**, Mahmoud H. DarAssi, Muhammad Altaf Khan, (2021). Global dynamics for a discrete quarantine/isolation model. *Results in Physics*. 21, 103788.
- Hussam Alrabaiah, Mohammad A. Safi, Mahmoud H. DarAssi, **Bashir Al-Hdaibat**, Saif Ullah, Muhammad Altaf Khan, Syed Azhar Ali Shah, (2020). Optimal control analysis of hepatitis B virus with treatment and vaccination. *Results in Physics*. 19, 103599.
- **B. Al-Hdaibat**, (2020). Homoclinic solutions in Bazykin's predator-prey model. *Discontinuity, Nonlinearity, and Complexity*. 9(3), 339-350.
- M.F.M. Naser, **B. Al-Hdaibat**, G. Gumah & O. Bdair, (2020). On the consistency of local fractional semilinear Duhem model. *International Journal of Dynamics and Control*. DOI: <https://doi.org/10.1007/s40435-019-00607-9>.
- **B. Al-Hdaibat**, S. Al-Ashhab & R. Sabra, (2019). Explicit solutions and bifurcations for a system of rational difference equations. *Mathematics*. 7(1), 96.
- **B. Al-Hdaibat**, (2019). Bifurcations in a chaotic duopoly game with a logarithmic demand function. *Dynamics of Continuous, Discrete and Impulsive Systems Series B: Applications and Algorithms*. 26(6), 447-456.
- **B. Al-Hdaibat**, M.F.M. Naser & M.A. Safi, (2019). Degenerate Bogdanov-Takens bifurcations in the Gray-Scott model. *Nonlinear Dynamics and Systems Theory*. 19(2), 253-262.
- **B. Al-Hdaibat**, W. Govaerts, D.L. van Kekem & Yu.A. Kuznetsov, (2018). Remarks on homoclinic structure in Bogdanov-Takens map. *Journal of Difference Equations and Applications*. 24(4), 575-587.
- M.H. Dar Assi, M.A. Safi & **B. Al-Hdaibat**, (2018). A delayed SEIR epidemic model with pulse vaccination and treatment. *Nonlinear Studies*. 25(3), 521-534.
- S. Al-Shawaqfeh, M.F.M. Naser, **B. Al-Hdaibat** & A. Issa, (2017). On the generalized Duhem model associated with legendre polynomials. *Far East Journal of Mathematical Sciences*. 102(12), 2321-2334.
- N. Neiryck, **B. Al-Hdaibat**, W. Govaerts, Yu.A. Kuznetsov & H.G.E. Meijer (2016). Using MatContM in the study of a nonlinear map in economics, *Journal of Physics: Conference Series*. 692(1), 012013.
- **B. Al-Hdaibat**, W. Govaerts, Yu.A. Kuznetsov & H.G.E. Meijer, (2016). Initialization of homoclinic solutions near Bogdanov-Takens points: Lindstedt-Poincaré compared with regular perturbation method. *SIAM Journal on Applied Dynamical Systems*. 15-2, 952-980.
- Yu.A. Kuznetsov, H.G.E. Meijer, **B. Al-Hdaibat** & W. Govaerts (2015). Accurate approximation of homoclinic solutions in Gray-Scott kinetic model. *International Journal of Bifurcation and Chaos in Applied Sciences and Engineering*, 25(9), 1550125.
- **B. Al-Hdaibat**, W. Govaerts & N. Neiryck (2015). On periodic and chaotic behavior in a two-dimensional monopoly model, *Chaos, Solitons & Fractals*. 70, 27-37.
- Yu.A. Kuznetsov, H.G.E. Meijer, **B. Al-Hdaibat** & W. Govaerts (2014). Improved homoclinic predictor for Bogdanov-Takens bifurcation. *International Journal of Bifurcation and Chaos in Applied Sciences and Engineering*, 24(4), 1450057

- o **B. Al-Hdaibat & W. Govaerts** (2014). *MatCont tutorial on starting up homoclinic orbits from a Bogdanov-Takens point*, MatCont version 5.3. Available on <http://sourceforge.net/projects/matcont/>

References

- o **Prof. Dr. Willy Govaerts**, *Department of Applied Mathematics, Ghent University, Belgium.*
Email: willy.govaerts@ugent.be
- o **Prof. Dr. Yuri A. Kuznetsov**, *Department of Applied Mathematics, Utrecht University, The Netherlands.*
Email: kuznet@math.uu.nl
- o **Dr. Hil Meijer**, *Department of Applied Mathematics, Twente University, The Netherlands.*
Email: meijerhge@math.utwente.nl
- o **Dr. Saleem Al-Ashhab**, *Department of Mathematics, Al al-Bayt University, Mafraq, Jordan.*
Email: ahhab@aabu.edu.jo