

## DAMIAN KAJUNGURI

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### Personal details

Name: Damian KAJUNGURI  
Sex: Male  
Date of Birth: 16<sup>th</sup> December, 1980  
Nationality: Ugandan  
Occupation: Senior Lecturer  
Name of Institution: Kabale University, Kabale, Uganda  
Academic areas: Mathematical Epidemiology, Dynamical Systems, Differential Equations  
Languages: English in addition to my mother tongue  
Contact address: P.O. Box 317, Kabale, Uganda.  
Email: [dkajunguri@kab.ac.ug](mailto:dkajunguri@kab.ac.ug)/[dkajung@gmail.com](mailto:dkajung@gmail.com)  
Tel. +256 782 350710/+256 701 607094

### Education

- 2012 **PhD (Mathematics)**, Stellenbosch University, Cape Town, South Africa.  
**Thesis Title:** Modelling the control of tsetse and trypanosomiasis through application of insecticides on cattle in Southeastern Uganda.  
**Advisors:** John Hargrove, Joseph Y.T. Mugisha and Charles Waiswa.
- 2009 **MSc (Mathematics)**, Stellenbosch University, Cape Town, South Africa.  
**Thesis Title:** Modelling the impact of TB superinfection on the dynamics of HIV-TB coinfection.  
**Advisors:** John Hargrove, Farai Nyabadza and Rachid Ouifki
- 2007 **PGD (Mathematical Sciences)**, University of the Western Cape (AIMS), Cape Town, South Africa.  
**Essay Title:** Branching processes, extinction probabilities with application to pest eradication.  
**Advisors:** John Hargrove and Ekkehard Kopp
- 2004 **BSc (Education)**, Mathematics and Physics, Mbarara University of Science and Technology, Mbarara, Uganda.

## **Work Experience**

I have taught Mathematics both at Secondary and University level. Some of the courses that I have taught at University level include Applied Mathematics in the Chemical and Biological Sciences, Dynamical Systems, Population Dynamics, Mathematical Epidemiology, Ordinary Differential Equations and Partial Differential Equations, Engineering Mathematics, and Probability and statistics.

Below is a list of Institutions I have worked in.

- Oct. 2016 - Todate      Senior Lecturer - Kabale University, Kabale, Uganda.  
June 2014 - Sept. 2016    Lecturer - The Nelson Mandela African Institution of Science and Technology, Arusha, Tanzania.  
Feb. 2013 - May. 2014    Visiting Lecturer - Faculty of Science (Dept. Maths & Stat), Sultan Qaboos University, Muscat, Sultan of Oman.

## **University administrative appointments**

- July 2017 - Todate      Dean, Faculty of Science, Kabale University

## **Professional assignments**

- 2016 - Todate      Visiting Lecturer/External Examiner, The Nelson Mandela African Institution of Science and Technology, Arusha, Tanzania.  
2018 - Todate      External Examiner, Mbarara University of Science and technology, Mbarara, Uganda.

## **Publications**

1. Joshua A. Mwasunda, Jacob I. Irunde, Damian Kajunguri and Dmitry Kuznetsov (2022), Optimal control analysis of *Taenia saginata* bovine cysticercosis and human taeniasis, *Parasite epidemiology and control*, 16(2022) e0026.
2. Joshua A. Mwasunda, Jacob I. Irunde, Damian Kajunguri and Dmitry Kuznetsov (2021), Optimal control and cost-effectiveness analysis of Taeniasis and Cysticercosis in humans, pigs and cattle, *Communications in Mathematical Biology and Neuroscience*, 2021:83
3. Joshua A. Mwasunda, Jacob I. Irunde, Damian Kajunguri and Dmitry Kuznetsov (2021), Modelling and analysis of taeniasis and cysticercosis transmission dynamics in humans, pigs and cattle, *Advances in Defference Equations*, 2021:176
4. Damian Kajunguri, Elisha B. Are and John W. Hargrove (2019), Improved estimates for extinction probabilities and times to extinction for populations of tsetse (*Glossina spp*), *PLOS Neglected Tropical Diseases*, **13**(4), e0006973.
5. Anita M. Rugaika, Damian Kajunguri, Rob Van Deun, Bart Van der Bruggen and Karoli N. Njau (2018), Mass transfer approach and the designing of horizontal subsurface flow constructed wetland systems treating waste stabilisation pond effluent, *Journal of Water science and Technology*, **78**.12.
6. Ibrahim Mwita Fanuel, Allen Mushi and Damian Kajunguri (2018), Irrigation water allocation optimization using multi-objective evolutionary algorithm (MOEA)- a review, *Int. J. Simul. Multidisci. Des. Optim*, **9**, **A3**.

7. Joram Aminieli, Damian Kajunguri, Emmanuel A. Mpolya (2015), Mathematical Modeling on the Spread of Awareness Information to Infant Vaccination, *Applied Mathematics*, **5**, 101-110.
8. Leopard C. Mpande, Damian Kajunguri, Emmanuel A. Mpolya (2015), Modeling and stability analysis for measles metapopulation model with vaccination, *Applied and Computational Mathematics*, **4**, 431-444.
9. Damian Kajunguri, John W. Hargrove, Rachid Ouifki, Joseph Y.T. Mugisha, Paul G. Coleman and Susan C. Welburn (2014), Modelling the use of insecticide-treated cattle to control tsetse and *Trypanosoma brucei rhodesiense* in a multi-host population, *Bulletin of Mathematical Biology*, **76**, 673-696
10. John W. Hargrove, Rachid Ouifki, Damian Kajunguri, Glyn A. Vale and Stephen J. Torr (2012), Modeling the control of trypanosomiasis using trypanocides or insecticide-treated livestock, *PLOS Neglected Tropical Diseases*, **6**, e1615.

### **List of Graduate students**

#### **PhD students**

1. Ibrahim M. Fanuel (2021), Modelling the impact of anthropogenic activities on forest biomass and forest-dependent wildlife population [with Dr. Francis Moyo] NM-AIST - **Ongoing**
2. Joshua A. Mwasunda (2019), Modelling the Transmission Dynamics and Control of Taeniasis/Cysticercosis in Humans, Pigs and Cattle [with Prof. Dmitry Kuznetsov & Dr. Jacob Irunde] NM-AIST- **Submitted for examination**

#### **Masters students**

1. Ibrahim M Fanuel (2016), Optimization model for water allocation to users: A case study of Nduruma irrigation canal-Arusha, Tanzania [with Prof. Alen Mushi] NM-AIST, Tanzania -**Completed 2017**
2. Paul S. Mwita (2016), Mathematical modeling on dynamics and control strategies of Zika virus [with Prof. Livingstone Luboobi] NM-AIST, Tanzania-**Completed 2017**
3. Xavery Idan (2016), Mathematical modeling of transmission of urinary tract infection (UTI) in human population [with Dr. Joseph Ssebuliba] NM-AIST, Tanzania - **Completed 2017**
4. Kabigi Baraka Moses (2015), Modeling the impact of controlling drain latrine wastes in the drainage system on the dynamics of cholera in Tanzania [with Dr. Theresia Marijani] University of Dar es Salaam, Tanzania- **Completed 2017**
5. Leopard C. Mpande (2014), Modeling the impact of vaccination on the epidemiology of measles in metapopulation [with Dr. Emmanuel Mpolya] NM-AIST, Tanzania -**Completed 2015**
6. Joram Aminieli (2014),Mathematical modeling on the spread of awareness information to infant vaccination [with Dr. Emmanuel Mpolya] NM-AIST, Tanzania -**Completed 2015**

#### **AIMS Tanzania Structured Masters students**

1. Isaya Mahulu (2016), Modelling the Improvement of Cattle Productivity by Controlling African Trypanosomiasis, AIMS-Tanzania -**Completed 2016**
2. Dickson Dismas (2016), Mathematical Model for the Control of African Trypanosomiasis in Tanzania, AIMS-Tanzania -**Completed 2016**

## **Outreach**

1. Participated in the production of over 7,000 litres of KABSAFE liquid soap detergent that was made by Faculty of Science and distributed to Kigezi region as a community intervention against Covid-19 transmission in September 2021 .
2. Gave a talk on “Branching processes and applications” to the mathematics staff and students of Brainstorm High School, Kabale, Uganda on 14<sup>th</sup>, March 2020 when celebrating the International Day of Mathematics.
3. Together with the students and staff in Faculty of Science have demonstrated to the community in Kabale the type of research done in the Faculty annually at the University open day.

## **Conferences and Seminars**

### **Talks:**

1. Estimates for extinction probabilities and times to extinction for populations of tsetse (*Glossina spp*), Kabale University, Department of Mathematics Semina talk, September, 22, 2021
2. Optimal control of *Trypanosoma brucei rhodesiense* through mass chemoprophylaxis and insecticide-treated cattle, AIMS DATA TALK, November, 9, 2012.
3. Cost-effectiveness analysis of tsetse and *Trypanosoma brucei rhodesiense* control through application of insecticides on cattle. Society for Mathematical Biology 2012 Annual Meeting & Conference July 25-28, 2012, Knoxville, Tennessee, USA
4. Cost-effectiveness analysis of cheap and safe strategies for tsetse and sleeping sickness control. Annual meeting of the South African Mathematical Society, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa, November 29 - December 3, 2011.
5. A delay differential equations model for the impact of mass chemoprophylaxis and insecticide-treated cattle on the control of *T. b. rhodesiense*. DVTD/ITM International Colloquium on ‘Zoonoses and Neglected Infectious Diseases of Africa’, November 1-4, 2011, Johannesburg, South Africa.
6. Modelling the control of acute sleeping sickness through restricted application of insecticides on cattle in Southeastern Uganda, Annual meeting of the South African Mathematical Society, November 2-5, 2010, University of Pretoria, Pretoria, South Africa.

### **Attendance:**

1. 64th Lindau Nobel Laureate Meeting dedicated to Physiology/Medicine, June 29 – July 4, 2014, Lindau, Germany.
2. US-SA workshop on Mathematical Methods in Systems Biology and Population Dynamics, January 4-7, 2011, AIMS Muizenburg, Cape Town, South Africa.
3. Third International Conference on Neglected Zoonotic Diseases: Community based interventions for prevention and control, November 23-24, 2010, WHO Headquarters in Geneva, Switzerland.

## **References**

1. Prof. Benon C. Basheka,  
Deputy Vice Chancellor - Academic Affairs,  
Kabale University,  
P.O. Box 317, Kabale, Uganda.  
Email: *bbasheka@kab.ac.ug*
2. Prof. Joseph Y.T. Mugisha,  
Principal, College of Natural Sciences,  
Makerere University,  
P.O. Box 7062, Kampala, Uganda.  
Email: *jytmugisha@cns.mak.ac.ug*
3. Prof. John Hargrove,  
Senior Research Fellow,  
SACEMA, Private Bag X1  
Matieland, Stellenbosch 7602, South Africa.  
Email: *jhargrove@sun.ac.za*