Bertrand TEGUIA TABUGUIA

Oxford, United Kingdom - Wolfson Building, Parks Rd, Oxford OX1 3QG

> Latest update: January 2025 CV note: blue texts are clickable

DATA

First name, Last name: Bertrand, Teguia Tabuguia Date of Birth: March 11, 1993 Family Status: Married, one child Country and Place of Birth: Cameroon, Yaounde

EDUCATION

University of Kassel, Germany

Ph.D. in Mathematics, Computer AlgebraAugust 2018 – May 2020Title: Power Series Representations of Hypergeometric Type and Non-Holonomic Functions in Computer AlgebraAdvisor: Wolfram Koepf. Grade: distinction (Summa Cum Laude).

AIMS-Cameroon

 Master in Mathematical Sciences
 August 2017 – July 2018

 Pure and applied mathematics at AIMS (African Institute for Mathematical Sciences), Cameroon center.

 Research essay: Automatic Computation of Laurent-Puiseux Series of Hypergeometric-Type.

 Advisor: Wolfram Koepf. Grade: distinction.

 AIMS Taught Master, final grade: distinction

ENSP Yaounde-Cameroon

Engineering in Mathematics and Computer Science

Ecole Nationale Supérieure Polytechnique (ENSP). Master Thesis: Classification Non Supervisée et Suivi des Processus de Dynamique Forestière. Advisor: Vivien Rossi and Thomas Bouetou. Grade: distinction (excellent). Master in Computer Engineering, final grade: Good.

POSITIONS AND EXPERIENCE

University of Oxford, England	Oxford	
Department of Computer Science, Postdoctoral Research Associate	November 2023 – present	
I work with James Worrell on algorithmic theory of linear and nonlinear dynamica	l systems.	
MPI SWS, Germany	Saarbrücken	
Decision problems, Postdoctoral Researcher	June 2023 – October 2023	
Work mentored by Joël Ouaknine on problems related to holonomic sequences.		
Max Planck Institute for Mathematics in the Sciences (MPI MiS) Leipzig		
Nonlinear Algebra, Postdoctoral Researcher	March 2022 – May 2023	
Differential Algebra, Symbolic Computation, Algebraic Geometry, Mathematical Software.		
Work mentored by Bernd Sturmfels.		

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Kassel

Limbe

Yaounde

September 2011 - July 2016

University of Kassel, Germany

Computer Algebra, Research Associate Work supervised by Wolfram Koepf. Research and publications with programming in Maple and Maxima.

Maplesoft

Mathematical software developer, Maple external developer Integration of my Maple software into the Maplesoft system. Work supervised by Jürgen Gerhard.

AIMS-Cameroon

Essay phase Computer Algebra with the Computer Algebra System (CAS) Maxima. Developing a mathematical software for symbolic computation.

H2Altitude

Developer in Computer Engineering

Data flow management using Talend, MySQL, a little NoSQL, and Apache Kafka on AWS. Programming with Java Javascript, HTML 5, CSS 3, and the framework Symfony 2. Work under *considerable* pressure.

CIRAD

Engineer Internship And Collaboration

Understanding, modeling and implementing the dynamics of forest processes (birth, growth and mortality). Implementation (in R) available on GitHub at https://github.com/T3gu1a/Essays/tree/master. Probability and statistics: General clustering and Expectation-Maximization (EM) algorithm. Differential calculus and optimization.

ENSP-Cameroon

Pre-engineer internship

Symbolic computation with the Computer Algebra System (CAS) Singular. Algorithmic and programming, field theory, Galois theory.

TEACHING

University of Oxford	Oxford
Scientific Computing, Class Tutor	Academic year 2024/2025
With Jonathan Whiteley. A mixture of optimization, linear algebra, and program	mming.
AIMS-Cameroon	Limbe
Teaching Assistant, Tutor	March 2019 – May 2019
Tutoring students in learning pure and applied mathematics.	
Intelligentsia Corporation	Yaounde
Mathematics teacher	June 2015 – July 2015
Algebra, real analysis, and basic topology in classes of 30-45 students to prepare	entrance at university schools.

SCHOLARSHIPS

DAAD Erasmus+ program

Researcher, University of Kassel, Germany June 2020 - December 2020 A stay in Germany used for a partnership between AIMS-Cameroon and the University of Kassel. This funding allowed me to extend my stay in Germany to the end of 2020 for some research works resulting from my Ph.D. thesis.

DAAD Erasmus+ program

Ph.D. student, University of Kassel, Germany A stay in Germany used for a partnership between AIMS-Cameroon and the University of Kassel. This funding allowed me to extend my stay in Germany to April 2020 for the completion of my Ph.D. thesis.

DAAD STIBET

Ph.D. student, University of Kassel, Germany First stay in Germany for my Ph.D. work.

November 2019 – April 2020

Kassel

November 2018 – January 2019

Limbe April 2018 – May 2018

June – August 2021

Yaounde

December 2016 - August 2017

(Remotely) Waterloo, Canada

Yaounde

February 2016 – October 2016

July 2015 - September 2015

Yaounde

Kassel

Kassel

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Kassel June 2020 – February 2022

PUBLICATIONS

Ir	collaboration
0	On Rational Recursion for Holonomic Sequences.
	With Worrell, James.
	In Boulier, F., Mou, C., Sadykov, T.M., Vorozhtsov, E.V. (eds). Proceedings of CASC'24. LNCS, vol
	14938. Springer, Cham. April 2024. Supplementary files.
0	Concatenations of Terms of an Arithmetic Progression.
	With Luca, Florian. Submitted. April 2024.
	Supplementary files. A short version of this paper was accepted as a poster for ISSAC'24.
0	D-Algebraic Functions.
	With Ait El Manssour, Rida and Sattelberger, Anna-Laura.
	Journal of Symbolic Computation. January 2023. Published in August 2024.
	DOI: https://doi.org/10.1016/j.jsc.2024.102377 . Supplementary files.
0	Symbolic Conversion of Holonomic Functions to Hypergeometric-Type Power Series.
	Teguia Tabuguia, Bertrand and Koepf, Wolfram.
	Computer Algebra issue of the Journal of Programming and Computer Software. April 2022. Volume
	48. Pages 125-146. Preprint version.
0	FPS in Action: An Easy Way to Find Explicit Formulas for Interlaced Hypergeometric Se-
	quences.
	Teguia Tabuguia, Bertrand and Koepf, Wolfram.
	ACM Communication in Computer Algebra. July 2022. Poster.
0	On the Representation of Non-Holonomic Univariate Power Series.
	Teguia Tabuguia, Bertrand and Koepf, Wolfram.
	Maple Trans. 2, 1, Article 14315, 18 pages. August 2022.
0	Power Series Representations of Hypergeometric-Type Functions.
	Teguia Tabuguia, Bertrand and Koept, Wolfram.
	In Corless R., Gerhard J., Kotsireas I. (eds): Maple in Mathematics Education and Research. MC 2020.
	Communications in Computer and Information Science, Springer. July 2021.
0	Hypergeometric-Type Power Series.
	leguia labuguia, Bertrand and Koept, Wolfram.
	4th International Conference "Computer Algebra", Moscow. Pages 105-108. June 2021.
S	ingle-authored
0	Computing with D-algebraic sequences.
	Teguia Tabuguia, Bertrand.
	December 2024. Submitted.
0	Hypergeometric-Type Sequences.
	Teguia Tabuguia, Bertrand.
	Journal of Symbolic Computation. December 2023. Published in May 2024.
	DOI: https://doi.org/10.1016/j.jsc.2024.102328. Accompanying Software.
0	Arithmetic of D-Algebraic Functions.
	Teguia Tabuguia, Bertrand.
	Journal of Symbolic Computation. May 2023. Published in June 2024. DOI: https://doi.org/10.
	1016/j.jsc.2024.102348. Supplementary files.
0	Operations for D-Algebraic Functions.
	leguia labuguia, Bertrand.
	ACM Communications in Computer Algebra, Volume 57, Issue 2. Pages 51–56. June 2023. Software
	presentation at ISSAC 23. Supplementary files.

• Guessing with Quadratic Differential Equations. Teguia Tabuguia, Bertrand. Software presentation at ISSAC'22. ACM Communication in Computer Algebra. July 2022. Supplementary files. • A Variant of van Hoeij's Algorithm to Compute Hypergeometric Term Solutions of Holonomic **Recurrence Equations.** Teguia Tabuguia, Bertrand. J. Algorithm Comput.. December 2020.

• Computing with Hypergeometric-Type Terms. Teguia Tabuguia, Bertrand. April 2024. ACM Communication in Computer Algebra. Volume 58, Issue 2, Pages 23–26. June 2024. DOI (URL): https://doi.org/10.1145/3712023.3712025. Software presentation at ISSAC'24. Accompanying Software.

• An Algorithmic Random-Integer Generator based on the Distribution of Prime Numbers. Teguia Tabuguia, Bertrand. Research Journal of Mathematics and Computer Science 2019; 3:16. DOI: 10.28933/rjmcs-2019-06-1705.

TALKS & CONFERENCES

Kolchin Seminar

Invited Speaker Title: D-algebraic sequences.

Workshop, CIRM

Invited Speaker I accepted the invitation to give a talk at the workshop on Singularities, Differential Equations, and Transcendence.

FB10 AADM, Oberseminar

Speaker I gave a talk about Hypergeometric-Type Sequences.

CASC'24

September 2 - 6, 2024 Conference Talk Title: "On rational recursion for holonomic sequences" at the 26th international workshop of CASC'24.

ISSAC'24

Software and Poster Presenter I will present the mathematical software **HyperTypeSeq** and showcase my joint work with Florian Luca on a poster.

Kolchin Seminar

Invited Speaker Title: Differential elimination for the closure properties of D-algebraic functions.

SIAM AG meeting

Session Invited Speaker Invited speaker for the Minisymposia on "Symbolic Combinatorics".

Maple Conference 2022

Algorithm and Software presenter, Virtual I am one of the presenters for the theme Algorithm and Software. I talked about symbolic powers of functions defined by second-order linear ODEs.

The sixth annual meeting of the TRR 195

Speaker

I gave another version of my talk at ACA 2022 with connection to my programming for OSCAR (Open Source Computer Algebra Research System).

Online, USA April 4, 2025

Marseille, France February 24 – 28, 2025

Universität Kassel, Germany October 14, 2024

Rennes, France

NC State University, USA July 24 - 27, 2023

> **Online**, USA October 6, 2023

Eindhoven University, Netherlands July 10 - 14, 2023

Waterloo, Canada

November 02 – 03. 2022

Blaubeuren, Germany September 19 - 22

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Arithmetic. ISSAC'22 Poster and Software presenter July 04 - 07, 2022 I presented a poster and software. The poster was about using FPS to find closed-form representations of interlaced hypergeometric sequences. My software was about an extension of holonomic guessing to quadratic guessing. Workshop on Differential Algebra Session chair June 06 - 08, 2022 Tagung der Fachgruppe Computeralgebra Munich, Germany Speaker I gave a presentation entitled: Power series formulas with m-fold hypergeometric term coefficients. Maple Conference 2021 Algorithm and Software presenter November 02 – 05, 2021 I was one of the presenters for the theme Algorithm and Software. The talk was about non-holonomic power series. **ISSAC 2021** Saint Petersburg, Russia Attendant July 19 – 23, 2021 Attended to keep good track on cutting-edge research in Computer Algebra. 4th International Conference "Computer Algebra" Contributed talk June 28 – 29, 2021 I gave a talk on hypergeometric type power series. The corresponding extended abstract appear in the conference Proceedings. Maple Conference 2020 Algorithm and Software presenter November 02 – 06, 2020 I was one of the presenters for the theme Algorithm and Software. In this presentation, I made the first public demonstration of the most important result of my Ph.D. thesis: Power series representations of hypergeometric type functions. The corresponding paper was published in the conference Proceedings. **ICMS 2020** Software Demo presenter I was one of the software demo presenters. My algorithm, a variant of van Hoeij's algorithm, was accepted upon peer review. This was recorded in the conference Proceedings. Workshop on Applied Algebra Braunschweig, Germany Poster presenter

I was accepted to present a poster from my paper on randomness and the distribution of primes.

Mathematical Software

ACA 2022

Session invited speaker

HyperTypeSeq. Software for computations in the ring of hypergeometric-type sequences.

- NLDE (NonLinear algebra for Differential and Difference Equations): package for computations with D-algebraic functions. Subpackage **DalgSeq** is dedicated to the difference (discrete) case.
- The New FPS: state-of-the-art implementations for the Computer Algebra Systems (CASs) Maple and Maxima for computing formal power series, solving linear recurrence equations, and computing linear and quadratic differential equations. Recently updated for some multivariate computations...
- o Github account: **T3gu1a**.

COMPUTER SKILLS

Very good computer and programming skills.

• Maxima: Computer Algebra System (CAS), used since 2018.

Istanbul, Turkey

August 15 – 19. 2022 I am one of the invited speakers for the theme: D-finite Functions and Beyond: Algorithms, Combinatorics, and

Lille

Leipzig, Germany

March 09 – 11, 2022

Waterloo, Canada

Moscow, Russia

Waterloo, Canada

Braunschweig, Germany

July 13 – 16, 2020

June 07 - 08, 2019

- Maple: favorite CAS, used since 2020.
- Sagemath: main CAS used at AIMS-Cameroon (2017-2018).
- Singular: CAS used in pre-engineer internship at ENSP (3 months) (2015).
- R: main language used during my engineering internship (9 months).
- Julia, OSCAR: Since March 2022.
- **Python**: used since 2016 for general programming: scientific computing, software development.
- Most used web languages: HTML 5, CSS 3, Javascript, Php: to develop web applications.
- o Java: main programing language used for the three last years at ENSP Yaounde.
- MySQL: main system used for managing data bases at ENSP Yaounde (2013-2016).
- o Latex: Permanently used to produce pdf documents since 2014.
- Other languages used in the past: C, Prolog, Singular, UML (for design).
- o Operating System: Linux, Windows.
- Keyboard blind typing: very good speed.
- **Programming tasks**: Author of the Maple and Maxima worksheets of the book at http://www.computer-algebra.org.

During my free time in 2019, I thought and developed the game P&C Game, available on Google Playstore and at https://bertrand-t3gu1.itch.io/pc-game. A first version was done in Python, and a second using Javascript, CSS 3 and HTML 5. The latter was used to generate an apk-release for Google Playstore.

LANGUAGES

o French : Fluent	Native language
 English: Good level 	Main work language used since August 2017.
o German : Basic	Level A1, Goethe Institute of Yaounde (10 September - 31 October 2018).
	A2 not completed.

PERSONAL SKILLS

- **Fast learning**: Anything related to computer programming or mathematics is loved and I am always excited to learn more. *I don't work fast, but I work all the time.*
- **Perfectionist**: During my Ph.D. work, I always wanted my codes to have the best efficiency even though my supervisor was already satisfied.

INTERESTS & HOBBIES

- **Mathematics and their applications**: Symbolic Computation, Differential and Difference Algebra, Applied Algebraic Geometry, Dynamical Systems, Algorithmic Number Theory.
- o Computer programming: Doing programming exercises in python from websites like Kattis, CodeChef.
- Movies, series: Genius (Einstein); Numb3rs; The Oxford Murders; A Beautiful Mind; Good Will Hunting; Irrational man; One Tree Hill; Hannah Arendt; Jobs; X+Y; The Man who Knew Infinity; Stranger Things.
- o Drawing: Anything beautiful.
- Singing: Pop, R&B, like The Fray, Gavin Degraw and James Arthur.
- o Dancing: I have been a choreographer, I like harmonized dance.
- o **Sport**: Football, favorite players in order: Ronaldinho, Cristiano Ronaldo, Ronaldo and Samuel Eto'o.

PROFESSIONAL SERVICE

- Program committee member for Software presentation at the 50th International Symposium on Symbolic and Algebraic Computation (ISSAC 2025), Center for Research in Mathematics (CIMAT) in Mexico.
- Program committee member of the 25th International Workshop on Computer Algebra and Scientific Computing (CASC 2023), University of Havana, Havana, Cuba, August 28 – September 1, 2023.
- Editorial activities: Maple Transaction journal, Springer (monographs in mathematics), Journal of Symbolic Computation.

REFERENCES

Professor James Worrell

Professor of Computer Science, University of Oxford, UK. My current mentor Tel: +44 1865 273 843 Email: james.worrell@cs.ox.ac.uk

Prof. Dr. Bernd Sturmfels

Director of the Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany. Professor of Mathematics. My mentor at MPI MiS. Tel: +49 341 9959 750. Email: bernd@mis.mpg.de

Prof. Gleb Pogudin

Assistant Professor. Main advisor in Differential Algebra. LIX, CNRS, École Polytechnique, Institut Polytechnique de Paris, France. Email: gleb.pogudin@polytechnique.edu

Prof. Dr. Wolfram Koepf

Professor of Computer Algebra, University of Kassel, Germany. Ph.D. supervisor. Tel: +49 561 804 4245. Email: koepf@mathematik.uni-kassel.de

Dr. Jürgen Gerhard

Senior Director, Research at Maplesoft Supervisor for the integration of my Maple software into Maple. Email: jgerhard@maplesoft.com LinkedIn page

Professor Marco Garuti (Sadly passed away 3 years ago) Academic Director of AIMS-Cameroon. Professor of Algebraic Geometry, University of Padova, Italy and AIMS-Cameroon.

Dr. habil. Vivien Rossi

Biostatistician researcher, CIRAD (https://www.cirad.fr) University of Yaounde I and ENSP de Yaoundé. Main supervisor of my essay at ENSP de Yaoundé. Email: vivien.rossi@cirad.fr