Josué Tonelli-Cueto

Mathematician

Postdoctoral Researcher

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🏛 Johns Hopkins University
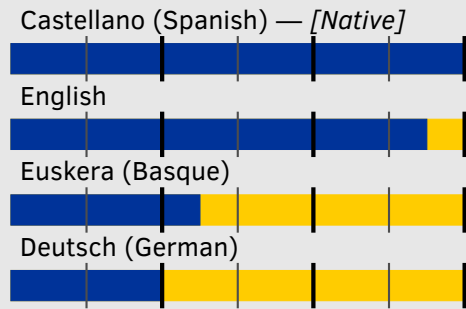
@ josue.tonelli.cueto@bizkaia.eu

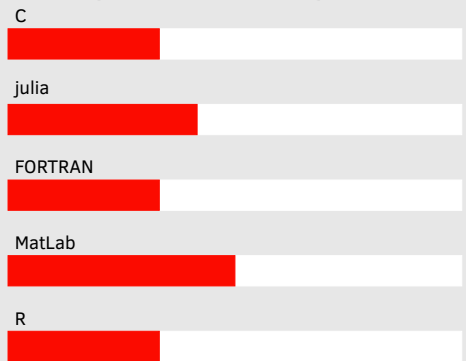🌐 tonellicueto.xyz

✏ illsaidthoughts.xyz

Interests

★ Numerical algorithms
and condition-based complexity
★ Computational algebraic geometry
★ Random geometry

Languages

Castellano (Spanish) — *[Native]*

English

Euskera (Basque)

Deutsch (German)

(*)[The scale follows the *Common European Framework of Reference for Languages: Learning, Teaching, Assessment* with the black lines indicating levels A2, B2 and C2 and the gray lines the levels A1, B1 and C1.]

Programming

C

julia

FORTRAN

MatLab

R

(*)[The skill scale for each program or programming language is from 0 (Fundamental Awareness) to 6 (Expert).]

Last update on the 23rd of June of 2024.

Profile photo: © Inria / Photo B. Fourrier

employment & education

2023-2X	Rufus Isaacs Postdoctoral Fellow	Johns Hopkins University
	Under the mentorship of Soledad Villar	
2022-23	Lecturer/Research Fellow	The University of Texas at San Antonio
	Under the mentorship of Alperen A. Ergür	
2020-22	FSMP Postdoctoral Fellow	Inria Paris & IMJ-PRG
	In the OURAGAN team mentored by F. Roullier and E. Tsigaridas	
2020	Postdoctoral researcher	Inria Paris & IMJ-PRG
	In the OURAGAN team mentored by F. Roullier and E. Tsigaridas	
2017-19	Dr. rer. nat. Mathematik (PhD in Mathematics)	BMS & TU Berlin
	Under the supervision of Prof. P. Bürgisser and Prof. F. Cucker.	
2014-17	M.Sc. Mathematics	BMS & TU Berlin
	M.'s t. "On the complexity of some Null-Cone Memebership Problems" with Prof. P. Bürgisser.	
2009-14	Licenciatura en Matemáticas con Premio Nacional Fin de Carrera	UPV/EHU
	B. Mathematics in the University of the Basque Country.	

grants & awards

2021	MATH+ Dissertation Award 2020	MATH+, BMS & Einstein Foundation Berlin
2020	3rd Prize in the Tiburtius Prizes 2020 of the Berlin Universities	LKRP Berlin
2017-19	BMS Doctoral Fellowship	BMS & Einstein Foundation Berlin
2014-16	Beca de "la Caixa" para estudios de posgrado en universidades europeas	
	Jointly awarded by Obra Social "la Caixa" and DAAD in 2014 for BMS Phase I.	

selected papers and preprints

'24 +	Learning equivariant tensor functions with applications to sparse vector recovery	arXiv:2406.01552
	With Wilson G. Gregory, Nicholas F. Marshall, Andrew S. Lee and Soledad Villar.	
'24 +	Some Lower Bounds on the Reach of an Algebraic Variety	arXiv:2402.15649
	With Chris La Valle.	
'23 +	On the Number of Real Zeros of Random Sparse Polynomial Systems	arXiv:2306.06784
	With Alperen A. Ergür and Máté L. Telek.	
'22 +	A p-adic Descartes solver: the Strassman solver	arXiv:2203.07016
2024	Probabilistic bounds on best rank-one approximation ratio	LMA
	With Khazhgali Kozhasov.	
2023	Generalized Perron Roots and Solvability of the Absolute Value Equation	SIMAX
	With Manuel Radons.	
2023	Condition Numbers for the Cube. I: Univariate Polynomials and Hypersurfaces	Journal of Symbolic Computation
	With Elias Tsigaridas. Conference version at ISSAC'20. arXiv:2006.04423	
2022	Functional norms, condition numbers and numerical algorithms in algebraic geometry	Forum Mathematics, Sigma
	With Felipe Cucker and Alperen A. Ergür. arXiv:2102.11727	
2022	On the Complexity of the Plantinga-Vegter Algorithm	Disc. & Comp. Geometry
	With F. Cucker and A.A. Ergür. Journal version at ISSAC'19. arXiv:2004.06879	
2022	Ultrametric Smale's α-theory	ACM Communications in Computer Algebra
	With Jazz G. Suchen. arXiv:2206.08392	
2022	On the Error of Random Sampling: Uniformly Distributed Random Points on Parametric Curves	ISSAC 2022
	With A. Chalkis and Ch. Katsamaki. arXiv:2203.02832	
2022	Beyond Worst-Case Analysis for Root Isolation Algorithms	ISSAC 2022
	With A.A. Ergür and E. Tsigaridas. arXiv:2202.06428	
2021	Computing the Homology of Semialgebraic Sets. II: General Formulas	J.FoCM
	With P. Bürgisser and F. Cucker. arXiv:1903.10710	
2020	Computing the Homology of Semialgebraic Sets. I: Lax Formulas	J.FoCM
	With P. Bürgisser and F. Cucker. arXiv:1807.06435	
2019	On the Number of Real Zeros of Random Fewnomials	SIAGA
	With P. Bürgisser and A.A. Ergür. arXiv:1811.09425	

selected talks

2023 CodEx Seminar (On-line)   "Condition Numbers and Probability for Explaining Algorithms"

2021 Mathematical Congress of the Americas 2021   University of Buenos Aires (On-line)
"Symbolic vs. Numerical: Allies or Enemies? (Introductory Talk)"

2021 SIAM Conference AAG 2021   Texas A&M (On-line)
"What's new in Computational Real Algebraic Geometry? (Introductory Talk)"

2021 Tutorial-a-thon of the Applied Algebraic Topology Network   On-line
"The Niyogi-Smale-Weinberger Theorem & its relatives"

selected organized activities

2025   VII Congreso de Jóvenes Investigadores de la RSME   RSME
Chairperson of the Organizing Committee

2023   Minisymposium *Computational Real Algebraic Geometry*   SIAM Conf. AAG '23
With Beatriz Pascual Escudero, Sebastian Debus and Cordian Riener

2023   AMS Special Session on   JMM2023
Data Science at the Crossroads of Analysis, Geometry, and Topology
(a Mathematics Research Communities session)
With Hitesh Gakhar and Harlin Lee

2022   Sesión Especial   II Encuentro RSME-UMA
Computación y Aplicaciones en Geometría Algebraica
With Alicia Dickenstein, Gabriela Jerónimo and Beatriz Pascual Escudero

2022   Mini-Symposium   5th SIAM TX-LA Meeting
Applications and Computation in Algebraic Geometry
With Jordy Lopez and Thomas Yahl

2022   Sesión Especial   RSME2022
Geometría Algebraica: la Aplicada, la Computacional y la Numérica
With Laura Brustenga i Moncusí and Roser Homs

2021   Minisymposium *Computational Real Algebraic Geometry*   SIAM Conf. AAG '21
With Cordian Riener

2021   S. Session *Symbolic and Numerical Computation with Polynomials*   MCA2021
With Diego Armentano, Matías Bender and Alperen A. Ergür

2020   3rd BYMAT Conference   UV & UPV
Member of the Scientific Committee and of the Poster Committee

2016-19   "What is...?" Seminar   BMS
Member of the Organizing Committee

2019   Minisymposium *Numerical methods
for structured polynomial system solving*   SIAM Conference AAG 2019
With Alperen A. Ergür, Pierre Lairez and Gregorio Malajovich

2018   6th BMS Student Conference (21-23/2)   BMS
With BMS Student Representatives of 2017

popularization of mathematics

2022   *Fête de la Science 2022* [French & Spanish]   Colegio de España en París
Science week open to the general public. Co-organizer representing SIEF.

2021   *Semi…¿qué? Las múltiples formas de lo semialgebraico*   [Spanish]
y cómo determrnarlas   Video
Presented at divulga NextGen on the 28th of May.

2015   *Emmy Noether, retrato alfabético* [Spanish]   Poem
Published in the blog "mujeres con ciencia" on the 5th of October.

2011-14   πkasle [PIkasle]   UPV/EHU Math Students' Magazine
Mainly online (with ISSN 2174-9027), but with some issues also on paper.
Founder (together with Ricardo Grande), editor, desktop publisher, cover designer
(except in issue number 10), interviewer and sporadic author.
  2013 Honor mention in *Ciencia en Acción XIV*
  2012 One 1st Prize in the *Image Difussion Student Awards of the UPV/EHU*
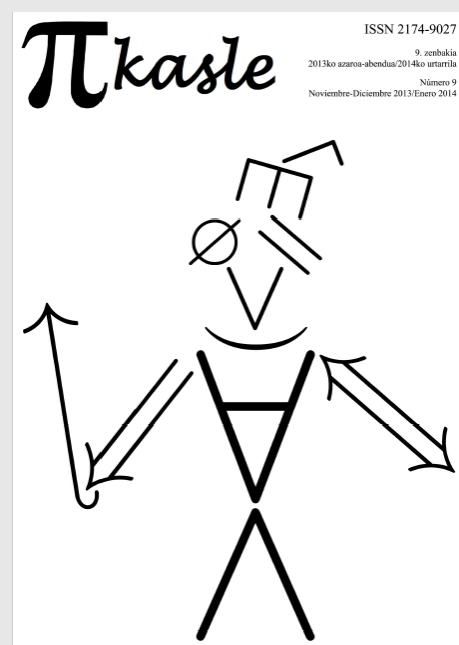
service

2015-18   Vocal del Comité de Evaluación de Titulaciones de Ciencias de UNIBASQ
Student evaluator at Agency for Quality of the Basque University System

Some designs ——

πkasle No. 7

πkasle No. 9

dramaTOURgia: un viaje teatral a través de España