

Ilja Gogić

Office Address

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Personal Information

- Born: 9th March 1982 in Zagreb, Croatia
- Citizenship: Croatian

Research Interests

Operator Algebras

- General theory of C^* -algebras and von Neumann algebras
- Automorphisms, derivations and elementary operators on C^* -algebras
- Topological and ring theoretic methods in C^* -algebras

Noncommutative algebra

- Characterizations of Jordan homomorphisms
- Algebraic variations of problems in operator algebras

Education

- **PhD in Mathematics**, Department of Mathematics, Faculty of Science, University of Zagreb, Croatia June 2010
PhD thesis: *Completely bounded maps and subhomogeneous C^* -algebras*
Advisor: Prof. Bojan Magajna (co-advisor: Prof. Damir Bakić)
- **BSc in Mathematics**, Department of Mathematics, Faculty of Science, University of Zagreb, Croatia January 2005
Diploma thesis: *K-Theory for C^* -algebras*
Advisor: Prof. Hrvoje Kraljević

Employment

- **Associate professor**, Department of Mathematics, Faculty of Science, University of Zagreb, Croatia December 2020–present
- **Assistant professor**, Department of Mathematics, Faculty of Science, University of Zagreb, Croatia March 2016–November 2020
- **Postdoctoral research fellow**, School of Mathematics, Trinity College Dublin, Ireland November 2014–February 2016
- **Postdoctoral associate**, Department of Mathematics, Faculty of Science, University of Zagreb, Croatia July 2010–October 2014
- **Research/Teaching assistant**, Department of Mathematics, Faculty of Science, University of Zagreb, Croatia March 2005–June 2010

Visiting Positions

- *Visiting assistant professor*, Department of Mathematics and Computer Science, University of Novi Sad, Serbia February 2013–January 2014
- *Visiting PhD student*, Faculty of Mathematics and Physics, University of Ljubljana, Slovenia October 2008–March 2009

Academic Awards

- *Distinguished young scientist award* – for the best young researchers of the Faculty of Science, University of Zagreb, Croatia 2014
- *Dean's award* – for the best students of the Department of Mathematics, University of Zagreb, Croatia 2004

Research Papers

1. I. Gogić, M. Tomašević, *An extension of Petek-Šemrl preserver theorems for Jordan embeddings of structural matrix algebras*, J. Math. Anal. Appl., **549** (2025), 129497.
2. I. Gogić, M. Tomašević, *Jordan embeddings and linear rank preservers of structural matrix algebras*, Linear Algebra Appl., **707** (2025), 1–48.
3. I. Gogić, T. Petek, M. Tomašević, *Characterizing Jordan embeddings between block upper-triangular subalgebras via preserving properties*, Linear Algebra Appl., **704** (2025), 192–217.
4. R. J. Archbold, I. Gogić, L. Robert, *Local variants of the Dixmier property and weak centrality for C^* -algebras*, Int. Math. Res. Not. IMRN **2** (2023), 1483–1513.
5. R. J. Archbold, I. Gogić, *The centre-quotient property and weak centrality for C^* -algebras*, Int. Math. Res. Not. IMRN, **2** (2022), 1173–1216.
6. I. Gogić, *The cb -norm approximation of generalized skew derivations by elementary operators*, Linear Multilinear Algebra, **69** (2021), 1543–1556.
7. I. Gogić, *On the ideal structure of the tensor product of nearly simple algebras*, Comm. Algebra, **48** (2020), 2248–2257.
8. Lj. Arambašić, I. Gogić, *Elementary operators on Hilbert modules over prime C^* -algebras*, J. Math. Anal. Appl., **485** (2020), 123861.
9. M. Brešar, I. Gogić, *Centrally stable algebras*, J. Algebra, **537** (2019), 79–97.
10. I. Gogić, R. M. Timoney, *The closure of two-sided multiplications on C^* -algebras and phantom line bundles*, Int. Math. Res. Not. IMRN, **2** (2018), 607–640.
11. E. Blanchard, I. Gogić, *On unital $C(X)$ -algebras and $C(X)$ -valued conditional expectations of finite index*, Linear Multilinear Algebra, **64** (2016), 2406–2418.
12. D. Eremita, I. Gogić, D. Ilišević, *Generalized skew derivations implemented by elementary operators*, Algebr. Represent. Theory, **17** (2014), 983–996.
13. I. Gogić, *The local multiplier algebra of a C^* -algebra with finite dimensional irreducible representations*, J. Math. Anal. Appl., **408** (2013), 789–794.
14. I. Gogić, *Derivations of subhomogeneous C^* -algebras are implemented by local multipliers*, Proc. Amer. Math. Soc., **141** (2013), 3925–3928.
15. I. Gogić, *On derivations and elementary operators on C^* -algebras*, Proc. Edinb. Math. Soc. (2), **56** (2013), 515–534.
16. I. Gogić, *Topologically finitely generated Hilbert $C(X)$ -modules*, J. Math. Anal. Appl., **395** (2012), 559–568.
17. I. Gogić, *Elementary operators and subhomogeneous C^* -algebras II*, Banach J. Math. Anal., **5** (2011), 181–192.
18. I. Gogić, *Elementary operators and subhomogeneous C^* -algebras*, Proc. Edinb. Math. Soc. (2), **54** (2011), 99–111.
19. I. Gogić, *Derivations which are inner as completely bounded maps*, Oper. Matrices, **4** (2010), 193–211.

Preprints

1. I. Gogić, M. Tomašević, *Continuous spectrum-shrinking maps between finite-dimensional algebras* (2025).
2. I. Gogić, M. Tomašević, *Classification of Jordan multiplicative maps on matrix algebras* (2025).
3. I. Gogić, M. Tomašević, *Multiplicative and Jordan multiplicative maps on structural matrix algebras* (2025).

4. A. Chirvasitu, I. Gogić, M. Tomašević, *A variant of Šemrl's preserver theorem for singular matrices* (2025).
5. A. Chirvasitu, I. Gogić, M. Tomašević, *Continuous spectrum-shrinking maps and applications to preserver problems* (2025).

**Conference
Talks**

1. *The Dixmier property and weak centrality for C^* -algebras*, 8th Croatian Mathematical Congress, Osijek, Croatia, July 2–5, 2024
2. *Applications of algebraic topology to operator algebras: Homogeneous C^* -algebras*, XXII Geometrical Seminar, Vrnjačka Banja, Serbia, May 26–31, 2024
3. *Applications of algebraic topology to operator algebras: Homogeneous C^* -algebras*, Kick-off meeting of CA21109 COST Action CaLISTA Bologna, Italy, June 5–9, 2023
4. *On noncommutative branched coverings*, XXI Geometrical Seminar, Belgrade, Serbia, June 26–July 2, 2022
5. *Elementary operators on C^* -algebras and Hilbert C^* -modules*, The 49th Canadian Operator Symposium, University of Guelph, May 31–June 4, 2021 (online)
6. *On automorphisms, derivations and elementary operators of C^* -algebras*, Great Plains Operator Theory Symposium 2021, Washington University in St. Louis, May 10–14, 2021 (online)
7. *Elementary operators on Hilbert C^* -modules*, International Workshop Hilbert C^* -Modules Online Weekend, December 5–6, 2020 (online)
8. *Centrally stable algebras*, 2nd Zagreb Workshop on Operator Theory University of Zagreb, July 29–30, 2020 (online)
9. *The centre-quotient property and weak centrality for C^* -algebras*, The 48th Canadian Operator Symposium, The Fields Institute, May 25–29, 2020 (online)
10. *The cb -norm approximation of derivations and automorphisms by elementary operators*, IWOTA 2019, Lisbon, Portugal, July 22–26, 2019
11. *The cb -norm approximations by two-sided multiplications and elementary operators*, Analysis, Geometry and Algebra, Trinity College Dublin, Ireland, May 8–11, 2019
12. *The cb -norm approximations by two-sided multiplications and elementary operators*, Workshop: Operator Days, Zagreb, Croatia, January 31–February 1, 2019
13. *On unital $C(X)$ -algebras and $C(X)$ -valued conditional expectations of finite index*, The ninth Symposium "Mathematics and Applications" 2018, Belgrade, Serbia, November 30 – December 1, 2018
14. *Fiberwise two-sided multiplications on homogeneous C^* -algebras*, 27th International Conference in Operator Theory, Timisoara, Romania, July 2–6, 2018
15. *Fiberwise two-sided multiplications on homogeneous C^* -algebras*, XX Geometrical Seminar Vrnjačka Banja, Serbia, May 20–23, 2018
16. *Two-sided multiplications and phantom line bundles*, 19th Geometrical Seminar Zlatibor, Serbia, August 28–September 4, 2016
17. *When are the lengths of elementary operators uniformly bounded?*, International Workshop on Operator Theory and Applications, Tbilisi, Georgia, July 6–10, 2015
18. *When are the two-sided multiplication maps norm-closed?*, 43rd Canadian Operator Symposium on Operator Theory and Operator Algebras, University of Waterloo, Canada, June 15–19, 2015
19. *CB -norm approximation of derivations by elementary operators*, Great Plains Operator Theory Symposium 2015, Purdue University, USA, May 26–30, 2015

20. *On derivations and elementary operators on C^* -algebras*, Infinite Dimensional Function Theory: Present Progress and Future Problems, University College Dublin, Ireland, January 8–9, 2015
21. *$C(X)$ -algebras as noncommutative branched coverings*, Masterclass on Classification, Structure, Amenability and Regularity, University of Glasgow, UK, August 25–29, 2014
22. *Topologically finitely generated Hilbert $C(X)$ -modules*, Days of Analysis in Novi Sad, University of Novi Sad, Serbia, July 3–7, 2014
23. *$C(X)$ -algebras as noncommutative branched coverings*, Zagreb Workshop on Operator Theory 2014, University of Zagreb, Croatia, July 3–4, 2014
24. *Derivations and local multipliers of C^* -algebras*, Great Plains Operator Theory Symposium 2014, Kansas State University, USA, May 27–31, 2014
25. *Finitely $C(X)$ -generated continuous $C(X)$ -algebras*, Young Functional Analysts' Meeting 2014, University of Debrecen, Hungary, April 11–13, 2014
26. *The local multiplier algebra of a C^* -algebra with finite-dimensional irreducible representations*, Banach Algebras and Applications, University of Gothenburg, Sweden, July 29–August 4, 2013
27. *On automorphisms, derivations and elementary operators*, The 4th Novi Sad Algebraic Conference & Semigroups and Applications 2013, University of Novi Sad, Serbia, June 5–9, 2013
28. *Topologically finitely generated Hilbert $C(X)$ -modules*, 24th International Conference on Operator Theory, West University in Timisoara, Romania, July 2–7, 2012
29. *Elementary operators and subhomogeneous C^* -algebras*, Banach Algebras 2011, University of Waterloo, Canada, August 3–10, 2011
30. *Finitely centrally generated C^* -algebras*, Applied Linear Algebra, University of Novi Sad, Serbia, May 24–28, 2010
31. *Derivations, completely bounded maps and the ideal structure of C^* -algebras*, Operators, Spaces, Algebras, Modules, University of Zagreb, Croatia, March 1–4, 2010

**Seminar &
Colloquium Talks**

1. *On elementary operators on C^* -algebras*, (informal) Analysis Seminar, Institute of Mathematics, University of Aberdeen, UK, December 12, 2019
2. *Centrally stable algebras*, Mathematical Colloquium, Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade, Serbia, June 20, 2019
3. *Local multipliers and elementary operators of C^* -algebras*, Operator Theory Seminar, University of Belgrade, Serbia, June 20, 2019
4. *Finitely $C(X)$ -generated continuous $C(X)$ -algebras*, Seminar on Geometry, Education and Visualization with Applications, Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade, Serbia, November 29, 2018
5. *The CB -norm approximation of generalized skew derivations by elementary operators*, Operator Theory Seminar, University of Belgrade, Serbia, November 29, 2018
6. *Fiberwise two-sided multiplications and the second Čech cohomology*, Combinatorics, Geometry, Topology and Algebra Seminar, University of Belgrade, Serbia, November 27, 2018
7. *The CB -norm approximation of generalized skew derivations by elementary operators*, Functional Analysis and Algebra Seminar, University of Ljubljana, Slovenia, November 22, 2018
8. *When are the lengths of elementary operators uniformly bounded?*, Analysis Seminar, Trinity College Dublin, Ireland, February 9, 2016

9. *Uniform approximation by two-sided multiplication maps*, Analysis Seminar, Trinity College Dublin, Ireland, October 27, 2015
10. *Uniform approximation by two-sided multiplication maps on C^* -algebras $M_n(C(X))$* , Combinatorics, Geometry, Topology and Algebra Seminar, University of Belgrade, Serbia, June 26, 2015
11. *CB-norm approximation of derivations by elementary operators*, Analysis Seminar, University of Glasgow, UK, March 3, 2015
12. *Noncommutative branched coverings*, Analysis Seminar, Trinity College Dublin, Ireland, January 27, 2015
13. *Derivations, elementary operators and local multipliers of C^* -algebras*, Functional Analysis and Algebra Seminar, University of Ljubljana, Slovenia, February 27, 2014
14. *Elementary operators on homogeneous C^* -algebras*, Combinatorics, Geometry, Topology and Algebra Seminar, University of Belgrade, Serbia, February 25, 2014
15. *$C(X)$ -valued conditional expectations of finite index*, Seminar for Analysis and Foundations of Mathematics, University of Novi Sad, Serbia, December 9, 2013
16. *Homogeneous C^* -algebras*, Combinatorics, Geometry, Topology and Algebra Seminar, University of Belgrade, Serbia, December 3, 2013
17. *Topological and C^* -algebraic K -theory*, Seminar for Analysis and Foundations of Mathematics, University of Novi Sad, Serbia, December 2, 2013
18. *C^* -algebras as noncommutative topology*, Seminar for Analysis and Foundations of Mathematics, University of Novi Sad, Serbia, November 25, 2013
19. *Applications of fibre bundles to C^* -algebras*, Seminar on Geometry, Education and Visualization with Applications, Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade, Serbia, November 21, 2013
20. *Noncommutative branched coverings*, Mathematical Colloquium, Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade, Serbia, November 8, 2013
21. *Derivations of C^* -algebras and local multipliers*, Mathematical Colloquium of Osijek Mathematical Society, University of Osijek, Croatia, April 11, 2013
22. *Derivations of C^* -algebras and local multipliers*, Scientific Colloquium of Croatian Mathematical Society, University of Zagreb, Croatia, January 30, 2013
23. *Derivations implemented by local multipliers*, Seminar for Analysis and Foundations of Mathematics, University of Novi Sad, Serbia, October 29, 2012
24. *On derivations and elementary operators on C^* -algebras*, Analysis Seminar, University of Aberdeen, UK, November 4, 2011
25. *Topologically finitely generated Hilbert $C(X)$ -modules*, Analysis Seminar, Trinity College Dublin, Ireland, November 1, 2011
26. *Elementary operators and subhomogeneous C^* -algebras*, Functional Analysis and Algebra Seminar, University of Ljubljana, Slovenia, April 16, 2010

Scholarships

- *Government of Ireland Postdoctoral Fellowship* November 2014–February 2016
- *CEEPUS Scholarship for exchange to Slovenia* October 2008–March 2009
- *University of Zagreb Scholarship* 2004
- *Croatian National Scholarship* 2002–2003

Grants & Financial Supports

- *Jordan mappings on matrix algebras*, short term research grant, University of Zagreb (PI: Ilja Gogić) 2025–present
- *Representations of Lie groups and operator algebras*, short term research grant, University of Zagreb (PI: Ana Prlić) 2024–present
- *Cartan geometry, Lie, Integrable Systems, quantum group Theories for Applications*, COST Action CA21109, Management Committee Member (PI: Rita Fioresi) 2023–present
- *Analytical and algebraic methods*, short term research grant, University of Zagreb (PI: Rudi Mrazović) 2020–2023
- *Applications of Methods of Functional and Harmonic Analysis*, short term research grant, University of Zagreb (PI: Ilja Gogić) 2019
- *Applications of Methods of Functional Analysis*, short term research grant, University of Zagreb (PI: Ilja Gogić) 2018
- *Operator algebras and Fourier Analysis*, short term research grant, University of Zagreb (PI: Ilja Gogić) 2017
- *Operator Methods in Combinatorics and Noncommutative Ring Theory*, short term research grant, University of Zagreb (PI: Vjekoslav Kovač) 2016
- *Operators on C^* -algebras and Hilbert modules*, Croatian Science Foundation, IP-2016-06-1046 (PI: Damir Bakić) 2016–2021
- *Fundamental problems on derivations of C^* -algebras*, Postdoctoral Fellow, Irish Research Council grant, GOIPD/2014/7 (PI: Richard M. Timoney) 2014–2016
- *Mappings on operator algebras*, short term research grant, University of Zagreb (PI: Dijana Ilišević) 2015
- *University of Zagreb research grant* – collaboration with the Topology Group, Mathematical Institute SANU, Belgrade (PI: Ilja Gogić) 2014
- *C^* -algebras and Hilbert C^* -modules*, short term research grant, University of Zagreb (PI: Dijana Ilišević) 2013–2014
- *Hilbert C^* -modules*, Postdoctoral Fellow, Ministry of Science, Education and Sports of the Republic of Croatia grant 037-0372784-2753 (PI: Boris Guljaš) 2007–2013
- *Hilbert modules and operator spaces*, Graduate Student, Ministry of Science, Education and Sports of the Republic of Croatia grant, 0037106 (PI: Boris Guljaš) 2005–2007

Thesis Supervision

- **PhD thesis**
 - Mateo Tomašević, *Jordan homomorphisms of structural matrix algebras*, Department of Mathematics, University of Zagreb (joint supervision with Peter Šemrl) 2024
- **MSc thesis**
 - Luka Jovanović, *Physics-inspired dynamical systems for optimization*, Department of Mathematics, University of Zagreb (joint supervision with Daniel Ebler) 2023
 - Perko Skoko, *Isometrically injective Banach spaces*, Department of Mathematics, University of Zagreb 2023
 - Luka Junaković, *C^* -algebras of compact operators*, Department of Mathematics, University of Zagreb 2022
 - Matija Livaić, *C^* -algebraic formalism of quantum mechanics*, Department of Physics, University of Zagreb (joint supervision with Ivica Smolić) 2021
 - Irena Dabić Mandić, *Methods for calculating finite sums*, Department of Mathematics, University of Zagreb 2021

- Mateo Tomašević, *On the epimorphic image of the centre of a C^* -algebra*, Department of Mathematics, University of Zagreb 2019
- Mateo Grabovac, *Classical results in the global theory of planar curves*, Department of Mathematics, University of Zagreb 2019
- Petar Dević, *Finite-dimensional division algebras*, Department of Mathematics, University of Zagreb 2019
- Matija Ivićinec, *Baire spaces and applications*, Department of Mathematics, University of Zagreb 2019

Teaching Experience

Courses at Department of Mathematics, University of Zagreb, Croatia

- Operators on normed spaces 2024–present
- Normed spaces 2023–present
- Differential calculus of functions of several variables 2016–present
- Integral calculus of functions of several variables 2017–present
- Student competitions in mathematics 2014, 2016–present
- Differential geometry 2 2018–2023
- Differential geometry 1 2017–2022
- Seminar: Mathematics outside mathematics 2017–2018
- Selected topics in operator algebras (PhD course) 2016
- Linear algebra 1 2016

Courses at Trinity College Dublin, Ireland

- Calculus for life scientists (MA1M01) December 2014, 2015

Courses at Department of Mathematics and Computer Science, University of Novi Sad, Serbia

- Operator algebras (PhD course) 2013
- Operator theory (Undergraduate course) 2013

Tutorial classes at Department of Mathematics, University of Zagreb, Croatia

- Analytic function theory 2005–2006, 2010
- Compact operators 2006–2007
- Concrete mathematics 1 2006
- Concrete mathematics 2 2007
- Fundamentals of mathematical analysis 2014
- Introduction to C^* -algebra theory 2007
- Introduction to numerical mathematics 2005–2006
- Linear algebra 1 2011–2012, 2014, 2016
- Linear algebra 2 2014
- Mathematical analysis 1 2005–2007, 2009–2012
- Mathematical analysis 2 2006–2011
- Mathematical methods of physics 1 2009–2012
- Mathematical methods of physics 2 2010–2012
- Integral calculus of functions of several variables 2012
- Operator algebras 2011
- Programming in C 2005
- Vector spaces 2007

Tutorial classes at Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia

- Mathematics 1 2007
- Mathematics 2 2008

Teaching Notes

- I. Gogić, *Introduction to functional analysis*, Department of Mathematics, University of Zagreb, 2024
- I. Gogić, P. Pandžić, J. Tambača, *Integral calculus of functions of several variables*, Department of Mathematics, University of Zagreb, 2021
- I. Gogić, P. Pandžić, J. Tambača, *Differential calculus of functions of several variables*, Department of Mathematics, University of Zagreb, 2021
- I. Gogić, *Differential geometry*, Department of Mathematics, University of Zagreb, 2018
- I. Gogić, *Selected topics in operator algebras*, Department of Mathematics, University of Zagreb, Croatia, 2017
- I. Gogić, A. Mimica, *Exercises in Mathematical analysis 2*, Department of Mathematics, University of Zagreb, 2010

Professional Activities

- Editorial Board Member of *Novi Sad Journal of Mathematics* (NSJOM) 2022–present
- Co-leader of Zagreb Functional Analysis Seminar 2021–present
- Co-organizer of the *2nd Zagreb Workshop on Operator Theory* 2020
- Co-leader of the Alps-Adria Seminar for Analysis and Algebra (Austria-Croatia-Slovenia trilateral seminar) 2019–present
- Leader of the Undergraduate University Programme in Mathematics Education 2016–2020
- Reviewer for AMS Mathematical Reviews 2014–present
- Member of Serbian Mathematical Sciences Association 2014–present
- Member of Croatian Mathematical Society 2005–present
- University of Zagreb Team Leader and Jury Member, *Vojtech Jarnik International Mathematical Competition*, Ostrava, Czech Republic 2008, 2010–2011
- University of Zagreb Team Leader and Jury Member, *International Mathematics Competition for University Students (IMC)*, Blagoevgrad, Bulgaria 2008, 2010

Languages

- Mother tongue: Croatian
- Active knowledge: English