CURRICULUM VITAE OF MARJETA KRAMAR FIJAVŽ

Date of Birth: March 18, 1973
Place of Birth: Ljubljana, Slovenia
Nationality: Slovene
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Current Address: Faculty of Civil and Geodetic Engineering, Chair of mathematics and Physics, Jamova 2, SI-1000 Ljubljana, Slovenia
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EDUCATION

1991-96: Undergraduate studies of Applied Mathematics
Faculty of Mathematics and Physics, University of Ljubljana
BSc Thesis: 'Methods of Lomonosov in search of invariant subspaces'
Advisor: Prof. Matjaž Omladič
1996-99: Graduate study of Mathematics
Faculty of Mathematics and Physics, University of Ljubljana
MSc Thesis: 'Triangularizability of families of operators'
Advisor: Prof. Matjaž Omladič
2004: Ph.D. in Mathematics
PhD Thesis: 'Matrix groups with submultiplicative spectrum'
Advisor: Prof. Matjaž Omladič

EMPLOYMENT

1996-2006: Teaching Assistant at Faculty of Civil and Geodetic Engineering, University of Ljubljana
2006-2013: Assistant Professor (tenure track) at Faculty of Civil and Geodetic Engineering, University of Ljubljana
2011-2016: Part-time researcher at Jožef Stefan Institute, Ljubljana
since 2000: Part-time researcher at Institute for Mathematics, Physics and Mechanics,
since 2013: Associate Professor (tenure track) at Faculty of Civil and Geodetic Engineering, University of Ljubljana

ADMINISTRATION

2013 - 2017: Head of the Chair for Mathematics and Physics at Faculty of Civil and Geodetic Engineering, University of Ljubljana
2017 - 2021: Member of the Senat Faculty of Civil and Geodetic Engineering, University of Ljubljana
2018 - 2022: Member of the Managing Board of Society of Mathematicians, Physicist, and Astronomers of Slovenia
2020 - 2022: Vice-President of the Society of Mathematicians, Physicist, and Astronomers of Slovenia
2022 - 2025: Member of the EMS Committee for Women in Mathematics
2021 - 2026: Chairman of the Scientific Council of the Institute of Mathematics, Physics and Mechanics, Ljubljana

Research stays

2002-03: Department of Mathematics, University of Tübingen, Germany; coordinator of the 6th TULKA Internet Seminar on Evolution Equations, 1 year.

April 2012: Faculty of Mathematics and Economics, Ulm University, Germany, Guest researcher, 1 month.

May–July 2012: Department of Mathematics, Faculty of Sciences, University of Tübingen, Germany, DAAD research grant & TEA visiting Professor, 3 months.

March 2015: Mathematisches Forschungsinstitut Oberwolfach, Germany, Research in Pairs Programme, 2 weeks.

Research interests

Functional analysis and operator theory: operator semigroups, evolution equations, dynamical processes in networks, PDE on metric graphs, positive operators.

Projects

1. COST Action CA18232 Mathematical models for interacting dynamics on networks, 2019 – 2024, `https://mat-dyn-net.eu/`. *Chair.*
2. EU-funded doctoral network BeyondTheEdge: Higher-Order Networks and Dynamics, 2024–2028, `https://www.beyondtheedge.network/`. *External Advisory Board.*

PhD Students

1. Britta Dorn, University of Tübingen, 2008 (joint with Rainer Nagel)
2. Fatih Bayazit, University of Tübingen, 2012 (joint with Rainer Nagel and Britta Dorn)
3. Irena Strnad, University of Ljubljana, 2017 (joint with Marijan Žura)
4. Michael Kaplin, University of Ljubljana, 2020 (joint with Marko Kandić)

Talks, conferences, visits

Invited talks.

1. *Delays, positivity, networks.* Evolution Equations and Semigroups - on the occasion of A. Rhandi's 60th birthday, Salerno, Italy, February 2025.
2. Lecture series at Summer School on Positive Operator Semigroups, Budapest, Hungary, September 2023.
3. *Dirac equation on metric graphs.* Dirac equation between discrete and continuous: new trends and applications, online, May 2023.
4. *Transport Equation on Metric Graphs.* Mathematical aspects of the Physics with non-self-Adjoint Operators, BIRS, Banff, Canada, July 2022.
5. *Relatively uniformly continuous semigroups on vector lattices.* Newcastle University, School of Mathematics, Statistics and Physics, Newcastle, UK, January 2021.
6. *The semigroup approach to transport processes in metric graphs.* RWTH Aachen University, Germany, November 2020.
7. *Linear hyperbolic equations on networks.* Mathematical Challenge of Quantum Transport in Nanosystems "Pierre Duclos Workshop", ITMO University, Saint Petersburg, Russia, September 2020.
8. *Linear hyperbolic equations on networks.* 6th Najman Conference on Spectral Theory and Differential Equations, Sveti Martin na Muri, Croatia, September 2019.

9. *Operator semigroups for linear processes on metric graphs.* Scientific Colloquium, Department of Mathematics, University J. J. Strossmayer Osijek, Croatia, May 2019.
10. *Operator semigroups approach to dynamical processes on metric graphs.* Joint Meeting of the Czech, Slovenian, Austrian, Slovak and Catalan Mathematical Societies, Bratislava, Slovakia, September 2018.
11. *Dynamische Netzwerke*, Vier Mathematikerinnen, vier Perspektiven - Berichte aus aktueller Forschung, University of Tübingen, Germany, July 2018.
12. *Operator semigroups approach to transport processes on metric graphs.* Scientific Colloquium, Faculty of Science - Department of Mathematics, University of Zagreb, Croatia, May 2018.
13. *Perturbation methods for differential operators on networks.* DFG-AIMS Workshop on Evolutionary Processes on Networks, March 20-24, 2018, Kigali, Rwanda.
14. *Linear parabolic equations on networks.* Finial Workshop of the 20th Internet Seminar Linear Parabolic Equations, Baronissi, Italy, June 2017.
15. *The semigroup approach to flows in networks.* University of Padova, Department of Mathematics, Differential Equations and Applications Seminar, Italy, April 2016.
16. Mini course: *The semigroup approach to transport and diffusion in networks.* Semigroups for Dynamical Systems: Perturbation, Positivity, Networks, Summer school, Wuppertal, Germany, July 2015.
17. *On positive controllability of boundary control systems.* Workshop of the GAMM Activity Group "Applied Operator Theory", Budapest, Hungary, May 2015.
18. *Dynamische Netzwerke: Überblick und Vorschau.* Doktorandenworkshop Dynamical Networks: Asymptotics and Control, Blaubeuren, Germany, January 2013.
19. *Kako išče Google?* Meeting of DMFA Slovenia, Rimske toplice, Slovenia, October 2012.
20. *Flüsse in Netzwerken - ein Überblick.* University of Tübingen, Germany, June 2012.
21. *Flows in time-dependent networks.* University Ulm, Germany, April 2012.
22. *Matrix groups with submultiplicative spectrum.* University of Tübingen, Germany, February 2004.
23. *Semigroups for flows on networks.* Eötvös Loránd University, Budapest, Hungary, November 2003.
24. *Flow semigroups on networks.* TULKA Treffen, Karlsruhe, Germany, July 2003.
25. *Spectral properties and irreducibility of semigroups of operators.* University of Marrakech, Morocco, October 2002.
26. *Spectral properties and irreducibility of semigroups of operators.* University of Tübingen, Germany, January 2002.

Conferences and visits.

1. QGraph 2024: Quantum graphs in Mathematics, Physics and Applications XII, Stockholm, Sweden, December 2024. Contributed talk: *On a non-autonomous transport problem on a metric graph*
2. 27th Internet Seminar 2023/2024: Harmonic Analysis Techniques for Elliptic Operators, Final Workshop, Luminy, France, June 2024.
3. Final Conference of the Cost Action MAT-DYN-NET Mathematical Models for Interacting Dynamics on Networks (CA18232), MAT-DYN-NET 24, Braga, Portugal, February, 2024.
4. Mat-Dyn-Net WG3 Meeting, Valenciennes, France, September 2023. Contributed talk: *On a non-autonomous network transport problem.*

5. 7th Najman Conference on Spectral Theory and Differential Equations, Brijuni, Croatia, September 2023. Contributed talk: *On a non-autonomous network transport problem.*

6. Challenges in Spectral Theory of Differential Operators, TU Graz, Austria, December 2022. Contributed talk: *Dynamic transmission conditions for linear hyperbolic systems on networks.*

7. 12th Euro-Maghrebian Workshop on Evolution Equations and COST WG1 meeting, Agadir, Morocco, September 2022.

8. European Women in Mathematics General Meeting 2022, Espoo, Finland, August 2022. Co-organiser of minisymposium: *CA18232 Mathematical models for interacting dynamics on networks.*

9. COST Action CA18232 Mat-Dyn-Net WG2 Meeting, Sorbonne Université, Saint-Cyr-l'École, France, April 2022. Contributed talk: *The semigroup approach to the linear Boltzmann equation on metric graphs.*

10. One-Parameter Semigroups of Operators (OPSO) 2022, Nizhny Novgorod, Russia, February 2022. Contributed talk: *Flows on Metric Graphs with General Boundary Conditions.*

11. MAT-DYN-NET WG2 Meeting, Novi Sad, Serbia, September 2021.

12. MAT-DYN-NET WG3&WG4 Meeting, Rome, Italy, September 2021.

13. 8th European Congress of Mathematics, 20-26 June 2021, Portorož, Slovenia, June 2021. Contributed talk in mini-session "CA18232: Variational Methods and Equations on Graphs'n", *Flows in infinite networks.*

14. Mathematical aspects of the physics with non-self-adjoint operators: 10 years after, Marseille, France, February 2021. Contributed talk: *Linear hyperbolic equations on networks.*

15. MAT-DYN-NET WG1 C_0-semigroups and beyond workshop, Zagreb, Croatia, February 2020. Contributed talk: *Generation of relatively uniformly continuous semigroups.*

16. MAT-DYN-NET WG3 Networks and similar structures workshop, Zagreb, Croatia, February 2020. Contributed talk: *Semigroup approach for dynamical systems on networks.*

17. Operator Theory and Krein Spaces, TU Wien, Austria, December 2019. Contributed talk: *Bi-Continuous Operator Semigroups for flows in Infinite Networks.*

18. Positivity X, University of Pretoria, South Africa, July 2019. Contributed talk: *Generation of relatively uniformly continuous semi-groups.*

19. University of Brescia, Italy, April 2019. Contributed talk: *The mathematics behind Google Search Engine.*

20. Instituto Superior Tecnico, Lisbon, Portugal, March 2019.

21. Operator Theoretic Methods in Dynamic Data Analysis and Control, Workshop at IPAM, University of California, Los Angeles, USA, February 2019.

22. Semigroups of Operators: Theory and Applications, Kazimierz Dolny, Poland, October 2018. Contributed talk: *On perturbing the domain of certain generators.*

23. Final conference: Discrete and Continuous Models in the Theory of Networks, ZIF Bielefeld, Germany, November 2017. Contributed talk: *Semigroup approach to waves and diffusion on networks.*

24. 5th Najman Conference on Spectral Theory and Differential Equations, Opatija, Croatia, September 2017. Contributed talk: *Waves and diffusion on metric graphs.*

25. Operator semigroups in Analysis: modern developments, Bedlewo, Poland, April 2017. Contributed talk: *Second order differential operators on $L^p([0,1],\mathbb{C}^n)$ with general boundary conditions.*

26. Transport Modeling and Management: Vehicles and Crowds, VIII Workshop on the Mathematical Foundations of Traffic Rome, Italy, March 2017. Contributed talk: *The semigroup approach to transport processes in networks.*
27. 7th European Congress of Mathematics, Berlin, Germany, July 2016.
28. ANalysis and COntrol on NETworks: trends and perspectives, Padova, Italy, March 2016.
29. Mathematik und Mehr, zum 75. Geburtstag von Prof. Dr, Rainer Nagel, Tübingen, Germany, November 2015.
30. Mathematical Foundations of Traffic, Workshop at IPAM, University of California, Los Angeles, USA, September/October 2015.
31. IWOTA 2014, Amsterdam, July 2014. Contributed talk: *Semigroups of max-plus linear operators.*
32. Zagreb Workshop on Operator Theory, Zagreb, Croatia, July 2014. Contributed talk: *Operators associated with forms and applications.*
33. University of Salerno, Italy, January 2014. Contributed talks: *1. How Google works? 2. An equal-area method for scalar conservation laws.*
34. Semigroups of Operators: Theory and Applications, Bedlewo, Poland, November 2013. Contributed talk: *The semigroup approach to dynamical processes in networks.*
35. Spectral Theory and Differential Operators, Graz, Austria, August 2012. Contributed talk: *Diffusion in networks with time-dependent coefficients.*
36. Yes, we can! Workshop on female perspectives in mathematical research, Tübingen, Germany, July 2012. Contributed talk: *Diffusion in networks with time-dependent coefficients.*
37. 6th Linear Algebra Workshop, Kranjska gora, Slovenia, June 2011.
38. AGFA Arbeitstagung, Blaubeuren, Germany, January 2011. Contributed talk: *Conservation laws.*
39. 3rd Dynamical Networks Days, Tübingen/Horb, Germany, April 2009.
40. 35 Jahre AGFA, Tübingen, Germany, November 2008. Contributed talk: *Semigroups for control theory.*
41. SIMAI 2008, Rome, Italy, September 2008. Contributed talk: *Flows and control problems in networks.*
42. 5th Linear Algebra Workshop, Kranjska gora, Slovenia, June 2008.
43. Budapest-Tübingen Workshop on Evolution Equations, Dobogókö, Hungary, March 2007.
44. Encounters between discrete and continuous mathematics, Blaubeuren, Germany, April 2008.
45. Eötvös Loránd University, Budapest, Hungary, April 2006.
46. Evolution in Networks, Blaubeuren, Germany, April 2006, Contributed talk: *Flows in networks.*
47. 4th Linear Algebra Workshop, Bled, Slovenia, May 2005.
48. AGFA Arbeitstagung, Horb, Germany, April 2005. Contributed talk: *Positive unipotent operators.*
49. 1st Dynamical Networks Days, Trento, Italy, October 2004. Contributed talk: *Semigroups for flows in networks.*
50. Evolution Equations and Applications, summer school, Cortona, Italy, July 2004.
51. 3rd Linear Algebra Workshop, Bled, Slovenia, June 2002. Contributed talk: *Irreducible groups with submultiplicative spectrum.*
52. Functional Analysis VII, conference and postgraduate school, Dubrovnik, Croatia, September 2001. Contributed talk: *Irreducible groups of operators with submultiplicative spectrum.*

53. Semigroups of Operators, summer school, Cortona, Italia, July 2001.
54. Operator Algebras and Operator Spaces, instructional course, Edinburgh, Scotland, April 2000.
55. Functional Analysis VI, conference and postgraduate school, Dubrovnik, Croatia, September 1999.
56. 2nd Linear Algebra Workshop, Bled, Slovenia, June 1999.
57. Functional Analysis V, conference and postgraduate school, Dubrovnik, Croatia, September 1997.

Organization of meetings.

1. Final Conference of the Cost Action MAT-DYN-NET, Braga, Portugal, February 2024, Scientific Committee.
2. Positivity XI, 10-14 July 2023. Ljubljana, Slovenia. Organizing Committee.
3. 12th Euro-Maghrebian Workshop on Evolution Equations and COST WG1 meeting, 12-16 September 2022, Agadir, Morocco, Scientific Committee.
4. C_0-semigroups and beyond, conference in honor of Rainer Nagel, online, November 2020. Organizing /Scientific Committee.
5. Women of mathematics on the Mediterranean shores, Bled, Slovenia, September 2019. Organizing /Scientific Committee.
6. 8th Linear Algebra Workshop, Ljubljana, Slovenia, June 2017. Organizing Committee.
7. 17th Internet Seminar 2013/14 - Positive Operator Semigroups and Applications, Blaubeuren, Germany, June 2014. Organizing/Scientific Committee.
8. Yes, we can! Workshop on female perspectives in mathematical research, Tübingen, Germany, July 2012. Organizing/Scientific Committee.
9. Encounters between discrete and continuous mathematics, Blaubeuren, Germany, April 2008. Organizing Committee.
10. 6th Internet Seminar 2002/2003 - Operator Matrices and Delay Semigroups, Blaubeuren, Germany, June 2003. Secretary of the Workshop.
11. 3rd Linear Algebra Workshop, Bled, Slovenia, June 2002. Secretary of the Workshop.

PUBLICATIONS

Books.

[1] with A. Batkai and A. Rhandi, *Positive Operator Semigroups: from Finite to Infinite Dimensions*, Birkhauser-Verlag, Basel, 2017.

Articles.

[1] with C. Budde, *Well-posedness of non-autonomous transport equation on metric graphs*, Semigroup Forum **108** (2024), 319–334.
[2] with E. Kramar, *A generalization of Kleinecke-Shirokov theorem for matrices*, Operators and Matrices **17** (2023), 51–55.
[3] with K.-J. Engel, *Flows on metric graphs with general boundary conditions*, J. Math. Anal. Appl. **513** (2022),126214.
[4] with, S. Nicaise, D. Mugnolo, Dynamic Transmission Conditions for Linear Hyperbolic Systems on Networks, J. Evol. Equ. (2021).
[5] with C. Budde, *Bi-continuous semigroups for flows in infinite networks*, Networks & Heterogeneous Media, 16 (2021), 553-567.
[6] with S. Nicaise, D. Mugnolo, Linear Hyperbolic Systems on Networks: well-posedness and qualitative properties, ESAIM: COCV **27** (2021), 7.
[7] with A. Puchalska, *Semigroups for dynamical processes on metric graphs*, Phil. Trans. R. Soc. A. **378**(2020), 20190619.

[8] with M. Kaplin, *Generation of relatively uniformly continuous Semigroups on Vector Lattices*, Anal Math **46** (2020), 293–322.

[9] with J. Zevnik, D. Kozelj, *Generalized normalized cut and spanning trees for water distribution network partitioning,* J. of Water Resources Planning and Management **145** (2019), 1–12.

[10] with K.-J. Engel, *Waves and Diffusion on Metric Graphs with General Vertex Conditions*, Evol. Equ. Control Theory, **8** (2019), 633–661.

[11] with J. Zevnik, D. Kozelj, *Efficient partitioning of water distribution networks using a graph-theoretical approach* (slovene). Acta hydrotechnica, **54** (2018), 35–50.

[12] with D. Kozelj, M. Gorjup, *An application of spectral graph partition for designing district metered areas in water supply networks* (slovene). Acta hydrotechnica **53** (2017), 81–96.

[13] with N. Bezak, S. Rusjan, M. Mikoš, and M. Šraj, *Estimation of Suspended Sediment Loads Using Copula Functions*, Water **9** (2017), Nr. 8: 628.

[14] with K.-J. Engel, *Exact and Positive Controllability of Boundary Control Systems*, J. Networks Heterogeneous Media **12** (2017), 319–337.

[15] with B. Andreianov, E. Sikolya, and A. Peperko, *Erratum to: Semigroups of max-plus linear operators*, Semigroup Forum **94** (2017), 477-479.

[16] with E. Sikolya and A. Peperko, *Semigroups of max-plus linear operators*, Semigroup Forum **94** (2017), 463–476.

[17] with I. Strnad and M. Žura, *Numerical optimal control method for shockwaves reduction at stationary bottlenecks*, J. Adv. Transport., **50** (2016), 841–856.

[18] *How Google works?* (slovene), Obzornik Mat. Fiz. 61 (2014), 121–131.

[19] with W. Arendt and D. Dier, *Diffusion in networks with time-dependent transmission conditions*, Appl. Math. Optim. 69 (2014), 315-33.

[20] with F. Bayazit and B. Dorn, *Asymptotic periodicity of flows in time-depending networks*, J. Networks Heterogeneous Media **8** (2013), 843–855.

[21] with M. Lakner and M. Škapin Rugelj, *Equal-area method for scalar conservation laws*, The ANZIAM Journal **53** (2012), 156–170.

[22] Semigroups Working Group at LAW'08, Kranjska gora, *Semigroups of operators with nonnegative diagonals*, Linear Algebra Appl. **433** (2010), 2080–2087.

[23] with K.-J. Engel, B. Klöss, R. Nagel, and E. Sikolya, *Maximal controllability for boundary control problems*, Appl. Math. Optim. **62** (2010), 205–227.

[24] with B. Dorn, R. Nagel, and A. Radl, *The semigroup approach to flows in networks*, Physica D: Nonlinear Phenomena **239** (2010), 1416–1421.

[25] with K.-J. Engel, R. Nagel, and E. Sikolya, *Vertex control of flows in networks*, J. Networks Heterogeneous Media **3** (2008), 709–722.

[26] with D. Mugnolo and E. Sikolya, *Variational and semigroup methods for waves and diffusion in networks*, Appl. Math. Optim. **55** (2007), 219–240.

[27] Semitransitivity Working Group at LAW'05, Bled, *Semitransitive subspaces of matrices*, Electron. J. Linear Algebra **15** (2006), 225–238 (electronic).

[28] *Representations of p-groups with submultiplicative spectra*, Linear and Multilinear Algebra, **54** (2006), 313–320.

[29] *The structure of irreducible matrix groups with submultiplicative spectrum*, Linear and Multilinear Algebra, **53** (2005), 13–25.

[30] with E. Sikolya, *Spectral properties and asymptotic periodicity of flows on networks*, Math Z. **249** (2005), 139–162.

[31] *Irreducible groups with submultiplicative spectrum*, Lin. Alg. Appl. **378** (2004), 273–282.

[32] with D. Mugnolo and R. Nagel, *Semigroups for initial-boundary value problems*, Progress in Nonlinear Differential Equations, Vol. **55**, 275-292, Birkhauser Verlag 2003.

[33] *Irreducible groups of operators with submultiplicative spectrum – extended abstract*, Functional analysis, VII (Dubrovnik, 2001), 129–130, Various Publ. Ser. **46**, Univ. Aarhus, Aarhus, 2002.

[34] with D. Mugnolo and R. Nagel, *Theory and applications of one-sided coupled operator matrices*, Conf. Semin. Mat. Univ. Bari, **283** (2002), 1–29.