Nina Skorin-Kapov, PhD

Associate Professor (Profesor Contratado Doctor)
Head of GICOT research group at CUD
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PERSONAL DATA:

Date of birth:	January 14, 1981
Place of birth:	Zagreb, Croatia
Citizenship:	Croatia and USA
Residency:	Spain

(last updated January 2023)

EDUCATION

2006   **Ph.D. in Electrical Engineering in the field of Telecommunications**, Faculty of Electrical Engineering and Computing, University of Zagreb, Zagreb, Croatia.
- Doctoral thesis title: Heuristic Algorithms for Virtual Topology Design And Routing and Wavelength Assignment in WDM Networks (in English)
- Homologated for Spain by Universidad Politécnica de Cartagena (UPCT)

2003   **Diploma Engineer (Dipl.Ing.) in Electrical Engineering in the field of Telecommunications and Informatics** (5 year program), Faculty of Electrical Engineering and Computing, University of Zagreb. (top 5% of her class)
- Engineering thesis title: Application of Steiner Trees to the Delay-Constrained Multicast Routing Problem (in Croatian)

PROFESSIONAL AND RESEARCH EXPERIENCE

2016-present   **Associate Professor** (PCD) at the **University Center of Defence, San Javier Air Force Base (Centro Universitario de la Defensa de San Javier, CUD San Javier),** MDE-UPCT Santiago de la Ribera, Murcia, Spain (associated with the Technical University of Cartagena (Universidad Politécnica de Cartagena, UPCT)).

    Since 2022: Head of **Computational and Telecommunications Engineering Group (GICOT)** research group at the University Center of Defense (CUD), San Javier Air Force Base, https://investigacion.cud.upct.es/grupo-gicot/

2013-2016   **Assistant Professor** (PAD) at the **University Center of Defence, San Javier Air Force Base (Centro Universitario de la Defensa de San Javier, CUD San Javier),** MDE-UPCT**,** Santiago de la Ribera, Murcia, Spain (associated with the Technical University of Cartagena (Universidad Politécnica de Cartagena, UPCT)).

2012-2013	**Associate Professor** at The Department of Telecommunications, **Faculty of Electrical Engineering and Computing, University of Zagreb**, Zagreb, Croatia.
2008-2012	**Assistant Professor** at The Department of Telecommunications, **Faculty of Electrical Engineering and Computing, University of Zagreb**, Zagreb, Croatia.
9/2006-9/2007	**Post-Doctoral Researcher** at The Networks and Computer Science Department (INFRES), **Telecom ParisTech (Ecole nationale supérieure des télécommunications),** Paris, France.
2006-2008	**Post-Doctoral research assistant** at The Department of Telecommunications, **Faculty of Electrical Engineering and Computing, University of Zagreb**, Zagreb, Croatia (On leave 9/2006-9/2007)
2003-2006	**Research assistant** at The Department of Telecommunications, **Faculty of Electrical Engineering and Computing, University of Zagreb,** Zagreb, Croatia.

OTHER AFFILIATIONS

Adjunct Associate Professor at the Department of Telecommunications, **Faculty of Electrical Engineering and Computing, University of Zagreb**, Zagreb, Croatia. 4.6.2018-present

External collaborator in the **Telecommunication Networks Engineering Group (Girtel)** at the Technical University of Cartagena

NATIONAL ACCREDITATIONS

Croatian scientific accreditation:
-   Znanstveni savjetnik (2011)

Spanish **ANECA** accreditation:
-   Titular de Universidad (2012),
-   Profesor Contratado Doctor , Profesor de Universidad Privada (2011)

Spanish scientific evaluation (**Sexenios**) by *La Comisión Nacional Evaluadora de la Actividad Investigadora (CNEAI):* **3**
-   2004-2009
-   2010-2015
-   2016-2021

Quinqenios: 3

MAIN INTERESTS

- Optimization and planning in communication networks, wide-area optical networks, operations research, (meta)-heuristic algorithms

VISITING RESEARCHER

Research visit in the framework of Erasmus+, Optical Networks Group, Chalmers University, Sweden, 10-11/5/2022. Hosts: Assistant prof. Marija Furdek and Prof. Paolo Monti.

Research and teaching visit in the framework of Erasmus+, Department of Mathematics and Computer Science, Karlstad University, Sweden, 5-8/11/2018 Host: Prof. Andreas Kassler

Visiting Professor and Research visits to the Department of Telecommunications, **Faculty of Electrical Engineering and Computing, University of Zagreb**, Zagreb, Croatia. Collaboration in the areas of optical networks planning and optical network security. Visiting professor in graduate course Heuristic Optimization Methods.
Dates: 13-23/6/2014, 13-30/10/2014, 16/11-11/12/2015, 18/12/2018-5/1/2019

Research visits in the framework of FP7-ICT-216863 project BONE, UKF project SAFE, Spanish project ONOFRE at **The Royal Institute of Technology KTH/ICT (KTH),** Stockholm, hosted by Professor **Lena Wosinska**, head of ONLab. Collaboration in secure optical networks planning.
Date and duration: 8/2008-9/2008 (2 weeks), other short term visits to ONLab (previously Negonet) co-located with workshops and invited talks (4-7/7/2010, 16-18/05/2011, 9/07/2011), 11-25/1/2015 (2 weeks)

Numerous research stays in the framework of FP7-ICT-216863 project BONE, UKF project SAFE and COST Action IntelliCIS at the **Technical University of Cartagena (UPCT), Cartagena, Spain** hosted by Associate Professor **Pablo Pavon-Marino** from the Department of Information Technologies and Communications. Collaboration in the areas of multi-hour optical networks planning and optical network security.
Dates and durations: 11/2008 -12/2008 (2 weeks); 4/2009-5/2009 (3 weeks); 4/2010-5/2010 (1 month); 10/2010-10/2010 (2 weeks); 2/2011-5/2011(3 months), 1-8/9/2011 (1 week); 16/3/2012-15/6/2012 (3 months)

AWARDS

2023   Cruz Mérito Military con Distintivo Blanco (Cross of Military Merit with White Decoration) BOD-2023-004-433

2013   Co-author of the paper winning the *Fabio Neri Best Paper Award* for 2013 of the Journal Optical Switching and Networking (see publications)

2012   Award for young scientists *"Vera Johanides"* for year 2011 awarded by the Croatian Academy of Engineering (HATZ)

2011   *"Exceptional outstanding paper" award* at international conference and convention MIPRO 2011

2008   National Award for Science**:** Annual Scientific Award for junior researchers (*Državna nagrada za znanost: Godišnja nagrada znanstvenim novacima*) for 2007 in the area of technical sciences.

2006	Annual award for young scientists awarded by the Society of University Teachers (*Godišnja nagrada društva sveučilišnih nastavnika mladim znanstvenicima*)
2003	Runner up for the Best Student Paper Award at *The 7th International Conference on Telecommunications, ConTEL, Zagreb 2003.*
2001-3	National scholarship awarded by the Croatian Ministry of Science and Technology
2002	The "Josip Lončar" award for excellence for academic year 2001/2002

MEDIA

- Included in supplement "Challengers in 2012" (50 people in Croatia), Jutarnji List (Croatian National newspaper), December 21st, 2011
- Featured in panorama article, Jutarnji List (Croatian National newspaper), July 3rd, 2011
- **Forbes Magazine**, Croatian edition, Cover page and portrait article themed "The New, Better Generation has Arrived", July 2011 issue
- Representing project SAFE on Good Morning Croatia June 2nd, 2011
- TV appearance, e-Hrvatska (e-Croatia) at conference and convention Mipro 2011, May 25th, 2011
- Live studio interview representing young scientists in Good Morning Croatia (national television), April 16th, 2008

INVOLVEMENT IN PROJECTS

2021-2024	ONOFRE-3: On-Demand Provisioning of the Network and Computing Resources from the Cloud to the Edge, Spanish national project PID2020-112675RB-C41
	- Researcher
2020-2022	MECANO – Eco-Efficient Mobility for Connected Citizens, Spanish national project PGE-MOVES-SING-2019-000104
	- Researcher
2019-2023	PHArA-ON: Pilots for Healthy and Active Ageing, H2020-SC1-FA-DTS-2018-2020 – 857188
	- Researcher
2018-2021	ONOFRE-2: Optical Networks Convergence in the Future Internet-2, Spanish national project TEC2017-84423-C3-2-P
	- Researcher
2017-2020	METRO-HAUL: METRO High bandwidth, 5G Application-aware optical network, with edge storage, compUte and low Latency. H2020-ICT-2016-2 (ID 761727), topic: ICT-7-2016
	- Researcher

2016-2020	COST Action CA15127: Resilient communication services protecting end-user applications from disaster-based failures (RECODIS) - Management Committee Substitute member and researcher
2016-2019	IN4WOOD-Industry 4.0 for wood and furniture manufacturers (ref. 575853-EPP-1-2016-1-ES-EPPKA2-SSA), EC Grant, Erasmus+ - Researcher
2015-2018	Optical Networks Convergence in the Future Internet (ONOFRE), Spanish national project TEC2014-53071-C3-1-P - Researcher
2015-2018	Toward Flexible and energy efficient datacentre networks (Frame Project funded by the Swedish Research Council) - External collaborator and researcher
2011-2013	Cost Action IC0806: Intelligent Monitoring, Control And Security Of Critical Infrastructure Systems (Intellicis) - Management Committee member and researcher
2010-2013	Security in All-Optical Networks (Swedish Vinnova funded project) - External collaborator and researcher
2009-2011	A Security Planning Framework for Optical Networks (SAFE), in collaboration with The Polytechnic University of Cartagena, Spain; The Royal Institute of Technology KTH/ICT, Sweden; and Athens Information Technology, Greece, finance by the Unity Through Knowledge Fund (UKF) in Croatia - Principal investigator
2008-2011	FP7-ICT-216863 Building the Future Optical Network in Europe (BONE) - Researcher and Joint Activity JA5 leader in Work Package 11
2007-2011	Analiza performansi i oblikovanje sirokopojasnih mreza (Analysis of the performance and design of broadband networks), National / Croatian Ministry of Science, Education and Sports - Researcher
2007-2008	Cost Action 291: Towards Digital Optical Networks - Researcher
2007-2008	FP6 Network of Excellence (NoE) e-Photon/ONe+ - Researcher
2006-2008	Hybrid Optical Networks under Dynamic Traffic (HONeDT), French-Croatian bilateral Cogito Project - Principal Investigator (1.1.2007-1.3.2008), Researcher(1.1.2006-31.12.2007)
2003-2006	Nove arhitekture telekomunikacijskih mreža (New architectures for telecommunication networks), National / Croatian Ministry of Science, Education and Sports - Researcher
2003-2004	New telecom world oriented network designing: data traffic sizing, Industrial / Ericsson Nikola Tesla d.d., Croatia - Researcher

PUBLICATIONS

PAPERS IN REFEREED JOURNALS AND MAGAZINES:

1. P. Pavon-Marino*, N. Skorin-Kapov*, A. Napoli , Tree-Determination, Routing and Spectrum Assignment (TRSA) using Point-to-Multipoint Coherent Optics, accepted for publication in **IEEE/ACM Journal of Optical Communications and Networking**,
   *Equally contributing authors.

2. P. Pavon-Marino, N. Skorin-Kapov, M. V. Bueno-Delgado, J. Back and A. Napoli, "On the benefits of point-to-multipoint coherent optics for multilayer capacity planning in ring networks with varying traffic profiles," in **IEEE/ACM Journal of Optical Communications and Networking**, vol. 14, no. 5, pp. B30-B44, May 2022.

3. R. Santos, N. Skorin-Kapov , H. Ghazzai, A. Kassler, Gia KhanhTran " Towards the Optimal Orchestration of Steerable mmWave Backhaul Reconfiguration", **Computer Networks**, Volume 205, 14 March 2022.

4. N. Skorin-Kapov, R. Santos, H. Ghazzai, A. Kassler, "A Randomized Greedy Heuristic for Steerable Wireless Backhaul Reconfiguration", **Electronics**, Vol. 10(4), 434, pp1-18, Feb 2021.

5. F.-J. Moreno Muro, N. Skorin-Kapov, P. Pavon-Marino, "Revisiting Core Traffic Growth in the Presence of Expanding CDNs", **Computer Networks**, Vol. 154, pp. 1-11, May 2019.

6. J.L. Marzo, S.G. Cosgaya, N. Skorin-Kapov, C. Scoglio, H. Shakeri, "A study of the robustness of optical networks under massive failures", **Optical Switching and Networking**, Vol. 31, pp. 1-7, January 2019.

7. A. Muhammad, N. Skorin-Kapov, M. Furdek, "Manycast, Anycast and Replica Placement (MARP) in Optical Inter-Datacenter Networks", **IEEE/OSA Journal of Optical Communications and Networking,** Vol. 9, No. 12, pp. 1161-1171, 2017.

8. N. Skorin-Kapov, M. Furdek, Z. Szilard, L. Wosinska, "Physical-Layer Security in Evolving Optical Networks", **IEEE Communications Magazine,** Vol. 54, No. 8, pp. 110-117, Aug. 2016.

9. M. Furdek, N. Skorin-Kapov, and L. Wosinska, "Attack-Aware Dedicated Path Protection in Optical Networks", **IEEE/OSA Journal of Lightwave Technology,** Vol. 34, No. 4, pp 1050-1061, Feb 2016

10. N. Skorin-Kapov, Amornrat Jirattigalachote, Lena Wosinska, "An ILP Formulation for Power Equalization Placement to Limit Jamming Attack Propagation in Transparent Optical Networks", **Security and Communication Networks**, Volume 7, pp. 2463–2468, 2014

11. R. Aparicio-Pardo, B. Garcia-Manrubia, P. Pavon-Marino, N. Skorin-Kapov, M. Furdek, "Balancing CapEx Reduction and Network Stability with Stable Routing-Virtual Topology Capacity Adjustment (SR-VTCA)", **Optical Switching and Networking,** Volume 10, Issue 4, November 2013, Pages 343–353. (**Winner of the Fabio Neri Best Paper Award for 2013**)

12. R. Aparicio-Pardo, N. Skorin-Kapov, P. Pavon-Marino and B. Garcia-Manrubia, "(Non)-Reconfigurable Virtual Topology Design under Multi-hour Traffic in Optical Networks", **IEEE/ACM Transactions on Networking**, Vol 20, Issue 5, pp. 1567-1580, Oct. 2012

13. N. Skorin-Kapov, M.Furdek, R. Aparicio Pardo and P. Pavón Mariño, "Wavelength Assignment for In-band Crosstalk Attacks in Optical Networks: ILP Formulations and Heuristic Algorithms", **European Journal of Operational Research,** Vol 222, No.3, pp.418-429, Nov. 2012.

14. R. Aparicio-Pardo, B. Garcia-Manrubia, N. Skorin-Kapov, P. Pavon-Marino, "Heuristic Approaches for Periodic Reconfiguration of Lightpath-based Networks under Multi-hour Traffic", **Journal of Networks**, Special Issue on "Transparent Optical Networking", Vol. 7, No. 5, pp. 800-811, May 2012.

15. Pablo Pavon Marino, Nina Skorin-Kapov, „Stable Routing with Virtual Topology Capacity Adjustment: A novel paradigm for operating optical networks", **IEEE/OSA Journal of Optical Communications and Networking,** Vol. 3, Issue 12, pp. 902-911, 2011.

16. Amornrat Jirattigalachote, Nina Skorin-Kapov, Marija Furdek, Jiajia Chen, Paolo Monti, and Lena Wosinska, "Sparse Power Equalization Placement for Limiting Jamming Attack Propagation in Transparent Optical Networks", **Optical Switching and Networking,** Vol. 8, Issue 4, pp 249-258, December 2011.

17. M. Furdek, N. Skorin-Kapov, M. Grbac, "Attack-Aware Wavelength Assignment for Localization of In-band Crosstalk Attack Propagation", **IEEE/OSA Journal of Optical Communications and Networking**, Vol. 2, Issue 11, pp. 1000-1009, November 2010.

18. N. Skorin-Kapov, J. Chen, L. Wosinska, "A New Approach to Optical Networks Security: Attack Aware Routing and Wavelength Assignment", **IEEE/ACM Transactions on Networking,** Vol. 18, Issue 3, pp 750-760, June 2010.

19. P. Pavon-Marino, R. Aparicio-Pardo, B. Garcia-Manrubia and N. Skorin-Kapov, "Virtual topology design and flow routing in optical networks under multi-hour traffic demand", **Photonic Network Communications**, Vol. 19, No. 1, pp.42-54, February 2010.

20. N. Skorin-Kapov, O. Tonguz, N. Puech, "Towards efficient failure management for reliable transparent optical networks", **IEEE Communications Magazine**, Vol. 47, No. 5, pp. 72-79, May 2009.

21. N. Skorin-Kapov, "A New Objective Criterion and Rounding Techniques for Determining Virtual Topologies in Optical Networks", **IEEE Communication Letters,** Vol. 11, No. 6, pp.540-542, June 2007.

22. N. Skorin-Kapov, "Routing and Wavelength Assignment in Optical Networks Using Bin Packing Based algorithms," **European Journal of Operational Research,** Vol. 177, Issue 2, pp. 1167-1179, March 2007.

23. N. Skorin-Kapov, "Heuristic Algorithms for the Routing and Wavelength Assignment of Scheduled Lightpath Demands in Optical Networks," **IEEE Journal on Selected Areas in Communications**, Vol. 24, No. 8, pp. 2-15, August 2006.

24. N. Skorin-Kapov, M. Kos, "A GRASP Heuristic for the Delay-Constrained Multicast Routing Problem," **Telecommunication Systems,** Vol. 32, No. 1, pp. 55-69, May 2006.

25. N. Skorin-Kapov, "Multicast Routing and Wavelength Assignment in WDM Networks: A Bin Packing Approach," **OSA Journal of Optical Networking**, Vol. 5, No. 4, pp. 266-279, April 2006.

OTHER JOURNAL PUBLICATIONS (Introduction as guest editor, ...):

26. M. Tornatore, <u>N. Skorin-Kapov</u> and P. Pavon-Marino, "Introduction to the Special Issue on Optical Network Design and Modeling", **IEEE/OSA Journal of Optical Communications and Networking**, vol. 3, no. 1, 2017

BOOK CHAPTERS (and LNCS publications):

27. Roza Goscien, Georgios Ellinas, Marija Furdek, Panayiotis Kolios, Piotr Lechowicz, Konstantinos Manousakis, Giannis Savva, <u>Nina Skorin-Kapov</u>, and Krzysztof Walkowiak, Chapter 8, "Security-aware Carrier Network Planning", in **Guide to Disaster-Resilient Communication Networks**, Jacek Rak, David Hutchison (Eds.), Computer Communications and Networks Series, Springer International Publishing, ISBN 978-3-030-44684-0, DOI: 10.1007/978-3-030-44685-7, pp193-217, 2020

28. M. Furdek, <u>N. Skorin-Kapov</u>, "Physical-Layer Attacks in Transparent Optical Networks", in **Optical Communications Systems**, N. K. Das (Ed.), InTech, Rijeka, Croatia, ISBN 979-953-307-230-1, pp. 123-146, February 2012.

29. L. Wosinska (edt.), D. Colle, P. Demeester, K. Katrinis, M. Lackovic, O. Lapcevic, I. Lievens, G. Markidis, B. Mikac, M. Pickavet, B. Puype, <u>N. Skorin-Kapov</u>, D. Staessens, and A. Tzanakaki, "Chapter 9: Network Resilience in Future Optical Networks", I. Tomkos, M. Spyropoulou, K. Ennser, M. Kohn, B. Mikac (eds.), Towards Digital Optical Networks (Cost Action 291 Final Report), **Lecture Notes on Computer Science** (LNCS 5412), pp.253-284, Springer 2009.

30. <u>N. Skorin-Kapov</u>, "WDM Optical Networks Planning using Greedy Algorithms", a chapter in **Greedy Algorithms**, W. Bednorz (Ed.). pp. 569-586, ISBN 978-953-7619-27-5, 2008 InTech Publishers.

31. <u>N. Skorin-Kapov</u>, N. Puech, "A Self-Organizing Control Plane for Failure Management in Transparent Optical Networks", in Self-Organizing Systems, **Lecture Notes in Computer Science** (LNCS 4725), (also in Proc of IWSOS2007 Sept 11-13, 2007), pp 131-145, Springer 2007.

PAPERS IN REFEREED CONFERENCE PROCEEDINGS:

32. Pablo Pavon-Marino, Nina Skorin-Kapov, Antonio Napoli, "A Network Dimensioning Algorithm for Exploiting the Capabilities of Subcarrier-based Point-to-Multipoint Coherent Optics", ECOC 2022

33. N. Skorin-Kapov, F. J. Moreno Muro, M. -V. Bueno Delgado and P. P. Marino, "Point-to-Multipoint Coherent Optics for Re-thinking the Optical Transport: Case Study in 5G Optical Metro Networks," *2021 International Conference on Optical Network Design and Modeling (ONDM)*, **invited paper,** 2021, pp. 1-4

34. R. Santos, <u>N. Skorin-Kapov</u>, H. Ghazzai, A. Kassler, "Fast Steerable Wireless Backhaul Reconfiguration", In proceedings of *2019 IEEE Global Communications Conference (GLOBECOM)*, Waikoloa, HI, USA, 9-13 Dec. 2019

35. Marija Furdek, Ajmal Muhammad, Nina Skorin-Kapov,"Survivable Manycast, Anycast and Replica Placement in Optical Inter-Datacenter Networks", *19th International Conference on Transparent Optical Networks (Icton 2017)*, invited paper, Girona, Spain, July 2-6 2017

36. Pablo Pavon-Marino, Francisco-Javier Moreno-Muro, Nina Skorin-Kapov, "Evolution of Core Traffic for Growing CDNs: Is the growth rate of core network traffic overestimated?", 2017 Optical Fiber Communication Conference (OFC), Los Angeles, California, USA, March 19 – 23, 2017.

37. Marija Furdek**,** Matija Džanko, <u>Nina Skorin-Kapov</u> and Lena Wosinska, **"**Planning of optical networks based on programmable ROADMs," in *Proc. Asia Communications and Photonics Conference (ACP)* 2015, **invited paper,** pp. 1-3, Hong Kong, November 19-23, 2015

38. Ajmal Muhammad, <u>Nina Skorin-Kapov</u>, Lena Wosinska, "Manycast and Anycast Routing for Replica Placement in DataCenter Networks", in Proceedings of the 41st European Conference on Optical Communication (ECOC 2015), September-October 2015.

39. Marija Furdek**,** <u>Nina Skorin-Kapov</u>, Szilard Zsigmond, and Lena Wosinska, "Vulnerabilities and security issues in optical networks", in *Proc. of the 16th International Conference on Transparent Optical Networks (Icton 2014)*, **invited paper,** pp. Tu.D3.5.1-4, Graz, Austria, July 6-10, 2014.

40. Marija Furdek**,** <u>Nina Skorin-Kapov</u>, and Lena Wosinska, "Shared path protection under the risk of high-power jamming", in *Proc. 19th European Conference on Network and Optical Communications (NOC 2014),* **invited paper,** pp. 23-28, Milan, Italy, June 4-6, 2014

41. S. Drakulić, <u>N. Skorin-Kapov</u>, "Green routing and wavelength assignment in optical networks", in *Proc. of the 15th International Conference on Transparent Optical Networks (Icton 2013),* , **invited paper**, Cartagena, Spain, June 23-27, 2013

42. M. Furdek, <u>N. Skorin-Kapov</u>, "Attack-Survivable Routing and Wavelength Assignment for high-power jamming", in *Proc. of the 17th Conference on Optical Network Design & Modeling (ONDM 2013),* Brest, France, April 16-19, 2013, pp. 70-75

43. M. Gulić, D. Lučanin, <u>N. Skorin-Kapov</u>, "A Two-Phase Vehicle based Decomposition Algorithm for Large-Scale Capacitated Vehicle Routing with Time Windows", in Proc. of MIPRO 2012, Opatija, Croatia, May 21-25, 2012, pp. 1285-9

44. M. Furdek, <u>N. Skorin-Kapov</u>, A. Tzanakaki: "Survivable Routing and Wavelength Assignment considering high-powered jamming attacks", post-deadline paper accepted to the *Asia Communication and Photonics Conference and Exhibition (ACP 2011)*, Shanghai, China, November 13-16, 2011.

45. M. Furdek, J. Chen, <u>N. Skorin-Kapov</u>, L. Wosinska, "Compound attack-aware routing and wavelength assignment against power jamming", accepted for the *Asia Communication and Photonics Conference and Exhibition (ACP 2011)*, Shanghai, China, November 13-16, 2011. (**3rd place for Best student paper award**)

46. M. Furdek, <u>N. Skorin-Kapov</u>, "Physical-Layer Attacks in All-Optical WDM Networks", In *Proc. of 34rd International Convention on Information and Communication Technology, Electronics and Microelectronics MIPRO, CTI - Telecommunications and Information MIPRO 2011*, Opatija, Croatia, May 23-27, 2011. (**Winner of "Exceptional outstanding paper" award**).

47. M. Karan, <u>N. Skorin-Kapov,</u> "A Branch and Bound Algorithm for the Sequential Ordering Problem", in *Proc. of 34rd International Convention on Information and Communication*

Technology, Electronics and Microelectronics MIPRO, CTI - Telecommunications and Information MIPRO 2011, Opatija, Croatia, May 23-27, 2011.

48. <u>N. Skorin-Kapov</u>, "Attack-Aware Planning and Optimization in Transparent Optical Networks," *Asia Communication and Photonics Conference and Exhibition (ACP 2010),* **invited talk**, Shanghai, China, December 2010.

49. A. Jirattigalachote, <u>N. Skorin-Kapov</u>, M. Furdek, J. Chen, P. Monti and L. Wosinska, "Limiting Physical-Layer Attack Propagation with Power Equalization Placement in Transparent WDM Networks, " *Asia Communication and Photonics Conference and Exhibition (ACP 2010),* Shanghai, China, December 2010. (**Winner of the Best Student Presentation Award)**

50. R. Aparicio-Pardo, P. Pavon-Marino, <u>N. Skorin-Kapov</u>, B. Garcia-Manrubia, J. Garcia-Haro, "Algorithms for virtual topology reconfiguration under multi-hour traffic using Lagrangian relaxation and tabu search approaches", In *Proc of 12th International Conference on Transparent Optical Networks (Icton 2010),* **invited paper**, Munich, Germany, June 27-July 1, 2010

51. M. Furdek, M. Bosiljevac, <u>N. Skorin-Kapov</u>, Z. Šipuš, "Gain Competition in Optical Amplifiers: A Case Study" In *Proc. of 33rd International Convention on Information and Communication Technology, Electronics and Microelectronics MIPRO, CTI - Telecommunications and Information MIPRO 2010,* Opatija, Croatia. pp. 229-234.

52. M. Furdek, <u>N. Skorin-Kapov</u>, M. Bosiljevac, Z. Šipuš. "Analysis of Crosstalk in Optical Couplers and Associated Vulnerabilities", In *Proc. of 33rd International Convention on Information and Communication Technology, Electronics and Microelectronics MIPRO, CTI - Telecommunications and Information MIPRO 2010*, Opatija, Croatia. pp. 223-228.

53. <u>N. Skorin-Kapov</u>, P. Pavon-Marino, B. Garcia-Manrubia, R. Aparicio-Pardo, "Scheduled Virtual Topology Design Under Periodic Traffic in Transparent Optical Networks|, *In Proc. of the Sixth International Conference on Broadband Communications, Networks and Systems (BROADNETS 2009)*, Madrid, Spain, September 14-16, 2009.

54. B. Garcia-Manrubia, R. Aparicio-Pardo, P. Pavon-Marino, <u>N. Skorin-Kapov</u>, J. Garcia-Haro, "MILP Formulations for Scheduling Lightpaths under Periodic Traffic", *In Proc of 11th International Conference on Transparent Optical Networks (Icton 2009)*, **invited paper**, São Miguel, Azores, Portugal, June 2009.

55. M. Furdek, <u>N. Skorin-Kapov</u>, " A Scalable Wavelength Assignment Approach for Preventive Crosstalk Attack Localization in Optical Networks", in *Proc. of the 10th International Conference on Telecommunications (ConTEL 2009),* Zagreb, Croatia, June 8-10, 2009.

56. <u>N. Skorin-Kapov</u>, M. Furdek, "Limiting the Propagation of Intra-Channel Crosstalk Attacks in Optical Networks through Wavelength Assignment", in *Optical Fiber Communication Conference and Exposition (OFC)* and the *National Fiber Optic Engineers Conference (NFOEC)* (Optical Society of America, Washington, DC, 2009), JWA65, March 2009.

57. <u>N. Skorin-Kapov</u>, "MILP formulation for routing lightpaths for Attack-Protection in TONs", *Proceedings of NAEC'08*, Riva del Garda, Italy, Sept. 2008, pp. 55-62.

58. <u>N. Skorin-Kapov</u>, J. Chen, L.Wosinska, "A tabu search algorithm for attack-aware lightpath routing", *The Proc. of the10th International Conference on Transparent Optical Networks (ICTON 2008),* Athens, Greece, June 22-26, 2008, pp.42-45.

59. <u>N. Skorin-Kapov</u>, O.Tonguz, N. Puech, "A novel optical supervisory plane model: The application of self-organizing structures", *The Proc. of the10th International Conference on Transparent Optical Networks (ICTON 2008),* **invited paper**, Athens, Greece, June 22-26, 2008, pp.10-13.

60. <u>N. Skorin-Kapov</u>, O. Tonguz, N. Puech, "Self-Organization in Transparent Optical Networks: A New Approach to Security", *The 9th International Conference on Telecommunications (Contel 2007),* Zagreb, Croatia, June 13-15, 2007, **invited paper,** pp. 7-14.

61. <u>N. Skorin-Kapov</u>, M. Kos, "Static Routing and Wavelength Assignment in Wavelength Routed WDM Networks", *The Proceedings of the 13th IEEE Mediterranean Electrotechnical Conference (Melecon2006),* Benalmadena (Malaga), Spain, May 16-19, 2006, pp 692-695.

62. <u>N. Skorin-Kapov</u>, M. Kos, "Heuristic Algorithms Considering Various Objectives for Virtual Topology Design in WDM Optical Networks", *The Proceedings of the 2005 International Conference on Telecommunication Systems: Modeling and Analysis ICTSMA2005*, Dallas, Texas Nov 17th-20th, 2005, pp195-209.

63. <u>N. Skorin-Kapov</u>, M. Kos, "A GRASP Heuristic for the Delay-Constrained Multicast Routing Problem", *The Proceedings of the 12th International Conference on Telecommunication Systems Management, ICTSM12*, Monterey, USA 2004.

64. <u>N. Skorin-Kapov</u>, M. Kos "The Application of Steiner Trees to Delay Constrained Multicast Routing: a Tabu Search Approach", *The Proceedings of the 7th International Conference on Telecommunications, ConTEL*, Zagreb 2003, pp. 443-448. (**Runner up for Best Student Paper**)

ABSTRACTS IN CONFERENCE PROCEEDINGS:

65. M. Furdek, A. Jirattigalachote, <u>N. Skorin-Kapov,</u> L. Wosinska, " Attack-Aware Optical Networks Planning: A Cost Analysis", Icton 2011, Stockholm, Sweden, June 2011 (**invited**)

66. <u>N. Skorin-Kapov</u>, P. Pavon-Mariño, "Scheduling, Routing and Assigning Wavelengths to Lightpaths in Optical Networks", European Chapter on Combinatorial Optimization, ECCO-XXI, Dubrovnik (Croatia), May 2008.

TEACHING PAPERS:
- "Implantación de metodología docente basada en la motivación vocacional de los alumnos del Centro Universitario de la Defensa de San Javier", Pedro J. García-Laencina et al.. Congreso Internacional de Innovacion Docente CIID 2014, Cartagena, Spain, 20-21 Feb. 2014
- "Diseño de una metodología de aprendizaje cooperativo basada en el puzzle de aronson para la asignatura de redes y servicios de comunicacion", María Teresa Martínez Inglés, Fernando Pereñíguez García, Nina Skorin-Kapov, Ana María Ríos Martínez, Congreso Internacional de Innovacion Docente CIID 2018, Murcia , Spain, 20-21 Marzo, 2018

TEACHING BOOKS:

INFORMÁTICA Libro de Problemas, 1º Edición, Fernando Pereñíguez García, MaríaTeresa Martínez Inglés, Nina Skorin-Kapov, Primera Edición. Noviembre 2020, Publicado por: Centro Universitario de la Defensa (CUD) de San Javier, ISBN: 978-84-942962-3-9

TEACHING EXPERIENCE

Currently teaching undergraduate courses **Informatics** and **Electromagnetic Exploration Systems** at the **University Centre of Defence at the Spanish Air Force Academy** (Centro Universitario de la Defensa de San Javier, CUD), Spain.

Academic Years	Course Information
2012/2013 – 2021/2022	**Informatics**, compulsory, **t**aught in the 1st year
2013/2014-present	**Electromagnetic Exploration Systems,** elective, taught in the 4th year

Currently teaching online graduate course **Metaheuristics** in the Management Science master entitled "**Máster en Técnicas de Ayuda a la Decisión**" given by the Polytechnic University of Cartagena (UPCT) since 2017 (Previously given by the University of Alcalá 2015-17)

Academic Years	Course Information
2015/2016-present	**Metaheuristics,** Operations Research Module

Taught doctoral courses **Heuristic Methods for Optimization** and **Heuristic Methods for Optimization with Project** from November 5th-7th, 2018 as visiting professor in the framework of Erasmus+ at the Faculty of Health, Science and Technology, **Karlstad University**, Karlstad, Sweden.

Teaching (Lectures) held as an **Assistant/Associate Professor** in the **5-year university study Electrical Engineering (FER-1), area Telecommunications and Informatics**, at the Faculty of Electrical Engineering and Computing, University of Zagreb, and the **3-year undergraduate (BSc) studies of Computing and Electrical Engineering and Information Technology** at the Faculty of Electrical Engineering and Computing, University of Zagreb, according to the Bologna system (FER-2):

Academic Years	Course Information
2007/2008	**Reliability of Telecommunications Systems**, compulsory, **t**aught in the 4th year (FER-1)
2008/2009	**Photonic Communication Technologies,** elective, taught in the 5th year (FER-1)
2007/2008	**Telecommunication Systems and Networks**, compulsory, taught in the 3rd year (FER-2)
2008/2009 - 2012/2013	**Information Theory**, compulsory **, t**aught in the 3rd year (FER-2)

Teaching (Lectures) held as an **Assistant/Associate Professor** in the 2 year **Master's study program Information and Communication Technology** at the Faculty of Electrical Engineering and Computing, University of Zagreb, according to the Bologna system (FER-2):

Academic Years	Course Information
2008/2009	**Laboratory of Telecommunications and Informatics 1 and 2,** compulsory, taught in the 1st year
2009/2010 - 2012/2013	**Photonic Communication Technologies**, elective, taught in the 2nd year
2008/2009 - 2012/2013	**Photonic Telecommunication Networks,** compulsory, taught in the 1st year
2010/2011- 2012/2013	**Heuristic Optimization Methods**, elective, taught in the 2nd year

Nina Skorin-Kapov, 12/17

Teaching (laboratory classes and excercies) held up to 2008 as a pre- and post-doctoral **Research/Teaching Assistant** in the **5-year university study Electrical Engineering (FER-1), area Telecommunications and Informatics**, at the Faculty of Electrical Engineering and Computing, University of Zagreb, and the **3-year undergraduate (BSc) studies of Computing and Electrical Engineering and Information Technology** at the Faculty of Electrical Engineering and Computing, University of Zagreb, according to the Bologna system (FER-2):

Academic Years	Course Information
2004/2005-2007/2008	**Transmission Systems**, compulsory, taught in the 4th year (FER-1)
2004/2005-2005/2006	**Logical Algebra**, compulsory , taught in the 3rd year (FER-1)
2005/2006	**Information Networks**, compulsory**, t**aught in the 3rd year (FER-1)
2004/2005-2005/2006	**Algorithms and Optimization Methods**, elective, **t**aught in the 3rd year (FER-1)
2005/2006	**Digital Logic**, compulsory**, t**aught in the 1st year (FER-2)
2007/2008	**Teletraffic Theory**, compulsory, taught in the 4th year (FER-1)

INVOLVEMENT IN TEACHING INNOVATION PROJECTS

2022   Implantación y evaluación de actividades de aula invertida en asignaturas del Grado de Ingeniería de Organización Industrial en el Centro Universitario de la Defensa, Convocatoria de Proyectos de Innovación y Mejora Docente 2021/2022 (PRIMED 2022)
- Coordinator

2019-20   Análisis de la Motivación del Alumno en el Grado en Ingeniería de Organización Industrial, Convocatoria De Proyectos De Innovación y Mejora Docente 2019/2020 (PRIMED 2019)
- Participant

TUTORING ACTIVITIES

Supervision of Ph.D. Dissertations
- Marija Furdek, "*Routing and wavelength assignment for limiting jamming attack propagation in optical networks*", defended on Dec. 10th, 2012.
    o Received "Silver Josip Lončar" award for outstanding doctoral dissertation.

Master´s students:
- Mentored 9 Master's theses
- Mentored 14 Master's seminars and served as co-mentor of 3 group projects

Bachelor´s students:
- Mentored or co-mentored 14 Bachelor's theses
- Served as leader and/or mentor of 6 Diploma Engineer theses (5-year program)
- Mentored 9 student seminars and served as co-mentor of 5 group projects

Hosting visiting PhD students at the Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia; research activities in secure optical networks planning and multi-hour virtual topology design:
- JiaJia Chen, PhD student from The Royal Institute of Technology (KTH), Sweden, 18/04-05/05/2008
- Ramon Aparicio-Pardo, PhD student from the Technical University of Cartagena (UPCT) Cartagena, Spain, 21/09- 23/11/2009
- Amornrat Jirattigalachote, PhD student from The Royal Institute of Technology (KTH), Sweden, 08/03- 27/03/2010

UNIVERSITY AND DEPARTMENTAL SERVICE

- **Erasmus Coordinator**, University Center of Defense, San Javier, 25.11.2019 – present

- Member of working group "Análisis de la Actividad Docente en los Centros Universitarios de la Defensa" for innovation in teaching at the University Center of Defence in San Javier, 1.2.2013-present

- ECTS coordinator for the masters study Information and Communications Technology and the ICT areas on the bachelors program at the Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia (December 2010- January 2013)
    - Coordinating exchanges for international programs Erasmus, Double Degree, Erasmus Mundus

INVITED TALKS

- On the Benefits of Point-to-Multipoint Coherent Optics in the Optical Metro Aggregation Networks, invited talk (30 min), Chalmers University, Sweden, May 10th 2022

- "Evolution of Core traffic for growing CDNs", IEEE invited talk (1h), Faculty of Electrical Engineerign and Computing, Uuniversity of Zagreb, Croatia, December 18th , 2018

- "Revisiting Core traffic growth in the presence of exanding CDNs" , invited talk (30 min), Karlstad University, Sweden, November 8th , 2018

- Physical-Layer Security and Planning in Optical Networks", at the HAKOM Croatian Post and Electronic Communications Agency, invited talk (1h), September 27th, 2012.

- "Attack-Aware Planning for Transparent Optical Networks", The *1st Workshop "Future Internet: Efficiency in high-speed networks" (W-FIERRO 2011)*, invited talk (1h), Cartagena, Spain, July 9th, 2011.

- "An Attack-Aware Planning Framework for Transparent Optical Networks", Workshop *"Survivability and Security Issues in All-optical Networks"*, invited talk (30 min), KTH, Stockholm, Sweden, May 17th, 2011.

- "Attack-Aware Planning and Optimization in Transparent Optical Networks," *Asia Communication and Photonics Conference and Exhibition (ACP 2010),* invited talk (30 min), Shanghai, China, December 2010.

- "(Non)-Reconfigurable Virtual Topology Design under Multi-hour Traffic in Transparent Optical Networks", *1st ONS (Optical Networking Systems) workshop*, invited talk (1h), KTH, Stockholm, Sweden, July 2nd, 2010.

- "Routing Lightpaths for Attack Protection in Transparent, Optical Networks", the *1st Workshop on "All-optical overlay networks",* invited talk (30 min), KTH, Electrum, Kista, Sweden, September 4th, 2008.

EDITORIAL AND REFEREEING ACTIVITIES

Associate Editor:

- OSA/IEEE Journal of Optical Communications and Networking (January 2018-today)
- ONDM Special Issue of OSA/IEEE Journal of Optical Communications and Networking, March 2017 (with M. Tornatore and P. Pavon Mariño)
- CIT. Journal of Computing and Information Technology (2011-2015)

Reviewing articles for the following journals and conferences:

Journals:
- IEEE/ACM Transaction on Networking (1)
- IEEE Communication Letters (2)
- European Journal of Operations Research (5)
- Optical Switching and Networking (5)
- Computers and Operations Research (3)
- Journal of Optical Networking (2)
- OSA/IEEE Journal of Optical Communications and Networking (6)
- IEEE Communications Magazine (1)
- Computer Networks(1)
- IEEE/OSA Journal of Lightwave Technology (5)
- Optics Letters (1)
- Photonic Network Communications (5)
- Security and Communication Networks (2)
- Automatika (1)
- Revista Ingeniería e Investigación (1)
- CIT. Journal of Computing and Information Technology (1)
- IEEE Access (1)
- Journal of Selected Topics in Quantum Electronics (1)

Conferences:
IEEE Globecom 2008/09/10/11/12/15, Mipro 2011/12/13, IEEE HPSR 2011/12/13/14/15, ONDM 2010/12/13/19/20/21/22, NETWORKS 2008/10/12, APC 2010/11, AOE/APOC 2009, IEEE Contel 2005/07/09/11/13/15, ICC 2007/12/14/15, WOCN 2007, ICP2012, IEEE WCNC 2013/14/15, IEEE Eurocon 2013, DESEi+d 2014/15, ICACCI 2018

Reviewing project proposals:
- External reviewer for the mid-term review of the Airbus-internal Central Research & Technology (CRT) project "DEPendable aErial Communication over Heterogeneous nEtworks (DEPECHE)" (2021)
- Reviewer of grant proposal in the Discovery Grants Program of the Natural Sciences and Engineering Research Council of Canada (2013)
- Reviewing project proposals for the Croatian Science Foundation for program International Collaborative Workshops (2010)
- Reviewing a bilateral French-Croatian project proposal for program "Cogito", Croatian Ministry of Science, Education and Sports (2008)

CONFERENCE ORGANIZATIONAL ACTIVITIES

Conference organization:

- TPC Co-Chair of the 20th International Conference on Optical Network Design and Modeling (ONDM 2016), Cartagena, Spain, May 9-12, 2016

- Social Media Chair of the 16th International Conference on High Performance Switching and Routing (IEEE HPSR 2015), Budapest, Hungary, July 1-4, 2015.

- Organizational Committee Member of the 1st Workshop "Future Internet: Efficiency in high-speed networks" (W-FIERRO 2011), Cartagena, Spain, July, 2011

- Tutorial Chair of IEEE International Conference on High Performance Switching and Routing (IEEE HPSR 2011), Cartagena, Spain, July, 2011

- Scientific Secretary of Program Committee, The international symposium "The Theory of Relativity and Philosophy" as part of "The 14th Days of Frane Petrić", Cres, Croatia, Sept. 26th-28th, 2005

Technical Program Committee (TPC) Member:

- ONDM 2022
- ONDM 2021
- ICNCC 2020 and ICNCC 2021
- ONDM 2020
- Asia-Pacific Conference on Communications (APCC) 2019
- ONDM 2019
- ONDM 2018
- Networks 2018
- ICACCI 2018
- ICC 2017 - ONS
- TENCON 2017
- ONDM 2016
- Networks 2016
- ICC 2016 - ONS
- III Congreso Nacional de i+d en Defensa y Seguridad (DESEi+d 2015)
- IEEE Globecom 2015
- IEEE HPSR 2015
- Networks 2015
- IEEE ICC 2015, Optical Networks and Systems Symposium
- II Congreso Nacional de i+d en Defensa y Seguridad, DESEi+d 2014
- IEEE WCNC 2015 - Track 3- Mobile and Wireless Networks
- ONDM 2015
- IEEE HPSR 2014
- IEEE WCNC 2014, Track 3 : NET
- IEEE ICC 2014, Optical Networks and Systems Symposium
- DESEi+d2013
- International Conference on Optical Networking Design and Modeling, ONDM 2014
- IEEE HPSR 2013
- International Conference on Optical Networking Design and Modeling, ONDM 2013
- IEEE ICC 2013, Optical Networks and Systems Symposium

- ICP 2012 (3rd International Conference on Photonics 2012).
- IEEE WCNC 2013
- IEEE Globecom 2012, FON (Flexible Optical Networks) Workshop
- 3DOC 2012
- ACP 2012, SC4: Network Architectures, Management, And Applications
- Ronext 2012 (Workshop on Reliability Issues in Next Generation Networks) as part of ICTON 2012
- IEEE HPSR 2012
- Networks 2012
- IEEE ICC 2012, Optical Networks and Systems Symposium and workshop on "New Trends in Optical Networks Survivability"
- IEEE Globecom 2011, Optical Networks and Systems Symposium
- IEEE Globecom 2010, Optical Networks and Systems Symposium
- IEEE HPSR 2011
- ACP 2011, SC4: Network Architectures, Management, And Applications
- ACP 2010, SC4: Network Architectures, Management, And Applications
- AOE/APOC 2009, SC4: Network Architectures, Management, And Applications
- Networks 2010
- Networks 2008
-

OTHER PROFESSIONAL ACTIVITIES

- Member of the Advisory Board of the Institute of Telemedicine of the Republic of Croatia, (December 2009 – November 2012)

- Serving as Lector (linguistic corrections) for Technical English for scientific papers. Lectored over 50 scientific papers. (2006-2012)

LANGUAGES
- English and Croatian – native tongues
- Spanish – fluent