

LUKA NERALIĆ

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PERSONAL

Born October 16, 1943. Married, wife Ivanka, two daughters Nataša (1966), Dunja (1971), six grandchildren Denis (1989), Nevio (1991), Mia (1999), Leo (2000), Jan (2005), Natko (2007).

EDUCATION

Ph.D., Faculty of Economics, University of Zagreb, Croatia, 1979.

M.Sc., Department of Mathematics, University of Zagreb, Croatia, 1971.

B.Sc., Department of Mathematics, University of Zagreb, Croatia, 1966.

DISSERTATIONS

L. Neralić, *Augmented Lagrangians and Optimality with Respect to Cost Function*, Ph. D. Thesis, The University of Zagreb, Faculty of Economics, Zagreb, Croatia, 1979. (In Croatian)

L. Neralić, *Dimension of Normal Spaces*, M. Sc. Thesis, Department of Mathematics, The University of Zagreb, Zagreb, 1971. (In Croatian)

FELLOWSHIPS

Grant for research at the Center for Russian and East European Studies (REES) and Katz Graduate School of Business, University of Pittsburgh, USA, August-September 2001.

Grant for research at the Department of Mathematics and Statistics, McGill University, Montreal, Canada, August-September 2000.

Scholarship of DAAD for research at the Lehrstuhl C für Mathematik, RWTH Aachen, Germany, October-December 1998.

Grant for research at the Center for Russian and East European Studies (REES) and Katz Graduate School of Business, University of Pittsburgh, USA, June-July 1996.

Scholarship of DAAD for research at Lehrstuhl C für Mathematik, RWTH Aachen, Germany, June-July 1995.

Grant for research at the W. Averell Harriman School Management and Policy, State University of New York at Stony Brook, USA, June 1994.

Grant for research at the Department of Mathematics and Statistics, McGill University, Montreal, Canada, April-May 1994.

Fulbright grant for postdoctoral research in the Center for Cybernetic Studies at the University of Texas at Austin, USA, 1985-1986.

Fellowship for research at Central Economic-Mathematical Institut of USSR Academy of Sciences in Moscow, USSR, 1973-1974.

AREAS OF RESEARCH INTEREST

Data Envelopment Analysis (DEA), Linear Programming, Parametric Programming, Multi-Objective Programming, Sensitivity and Stability Analysis.

BOOKS

Z. Lukač, L. Neralić, "Operational Research", University of Zagreb Text-Book, Second Edition, Element, Zagreb, 2013. (In Croatian)

L. Neralić, B. Šego, "Mathematics", University of Zagreb Text-Book, Element, Zagreb, Fourth Edition, 2015. (In Croatian)

L. Neralić, "Introduction to Mathematical Programming 1", University of Zagreb Text-Book, Fourth Edition, Element, Zagreb 2012. (In Croatian)

PAPERS IN BOOKS

D. Hunjet, L. Neralić and R. E. Wendell, “An Application of Categorical Models of Data Envelopment Analysis”, In: V. Charles and M. Kumar (Eds.), *Data Envelopment Analysis and Its Applications to Management*, Cambridge Scholars Publishing, Newcastle upon Tyne, Chapter Fifteen, pp. 239 - 250, 2012.

L. Neralić, “Sensitivity in Data Envelopment Analysis for Arbitrary Perturbations of All Data in the Charnes-Cooper-Rhodes Model”, In: *Parametric Optimization and Related Topics V*, (J. Guddat, R. Hirabayashi, H. Th. Jongen and F. Twilt eds.), Proceedings of the International Conference on Parametric Optimization and Related Topics V, Tokio (Japan), October 6 - 10, 1997, Peter Lang, Frankfurt am Main, 2000, pp.143 - 163.

L. Neralić and T. R. Sexton, “Sensitivity Analysis in Data Envelopment Analysis for the Case of Different Coefficients of Proportionality”, In: *Parametric Optimization and Related Topics IV*, (J. Guddat, H. Th. Jongen, F. Nožička, G. Still and F. Twilt, eds.), Proceedings of the International Conference on Parametric Optimization and Related Topics IV, Enschede (NL), June 6 - 9, 1995, Peter Lang, Frankfurt am Main, 1996, pp. 261 - 280.

L. Neralić, “Survey of Research in Multiobjective Programming in USSR”, In: *Multiobjective Programming*, (Lj. Martić, ed.), Informator, Zagreb, pp. 91-121, 1978. (In Croatian)

JOURNAL ARTICLES - APPEARED

X. Chen, Y. Gao, Q. An, Z. Wang and L. Neralić, Energy efficiency measurement of Chinese Yangtze River Deltas cities transportation: a DEA window analysis approach, *Energy Efficiency*, 2018, pp. 1-13, <https://doi.org/10.1007/s12053-018-9635-7>.

M. Mihelja aja, R. D. Banker, S. Fang, D. Hunjet, L. Nerali and R. E. Wendell, ”Efficiency Gains in Croatia’s Electricity Distribution Centers Following Industry Structure Changes”, *Data Envelopment Analysis Journal*: Vol. 3: No. 12, 2017, pp 119-150. <http://dx.doi.org/10.1561/103.00000018>

M. Khodabakhshi, S. Rashidi, M. Asgharian and L. Nerali, "Sensitivity Analysis of Input Relaxation Super Efficiency Measure in Data Envelopment Analysis", *Data Envelopment Analysis Journal*, Vol. 1, No. 2, 2015, 113-134. <http://dx.doi.org/10.1561/103.00000009>

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D. Hunjet, L. Neralić and R. E. Wendell, "Evaluation of the dynamic efficiency of Croatian towns using Data Envelopment Analysis", *Central European Journal of Operations Research* 23(3), 2015, 675-686, published online 14 December 2014; DOI 1007/s10100-014-0363-6

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M. Asgharian, M. Khodabakhshi and L. Neralić, "Congestion in Stochastic Data Envelopment Analysis: An Input Relaxation Approach", *International Journal of Statistics and Management Systems*, Vol. 5, No. 1, 2010, 84-106.

Z. Lukač, D. Hunjet and L. Neralić, "Solving the Production-Transportation Problem in the Petroleum Industry", *Investigacion Operacional*, Vol. 29, No. 1, 2008, 63-70.

J. Guddat, L. Neralić and O. Stein, "Sensitivity Analysis of the Proportionate Change of a Subset of Outputs or/and Inputs in DEA", *Mathematical Communications*, Vol. 11, No. 2, 2006, 187-201.

L. Neralić, "Preservation of Efficiency and Inefficiency Classification in Data Envelopment Analysis", *Mathematical Communications*, Vol. 9, No. 1, 2004, 51-62.

L. Neralić and O. Stein, "On Regular and Parametric Data Envelopment Analysis", *Mathematical Methods of Operations Research*, Vol. 60, No. 1, 2004, 15-28.

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V. Bahovec and L. Neralić, "Relative Efficiency of Agricultural Production in County Districts of Croatia", *Mathematical Communications*, Supplement, *Proceedings of the 8th International Conference on Operational Research KOI 2000* (Editors T. Hunjak and R. Scitovski), Croatian Operational Research Society, Osijek, Vol. 1, No. 1, 2001, pp. 111 - 119.

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L. Neralić, "On Some Applications of Data Envelopment Analysis in Banking", *Economics*, Vol. 2, No. 3, 1996, 493 - 521. (In Croatian)

A. Charnes and L. Neralić, "Sensitivity Analysis in Data Envelopment Analysis for the Case of Non-Discretionary Inputs and Outputs", *Glasnik Matematički Ser.III*, Vol. 30, No. 2, 1995, 359 - 371.

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- A. Charnes and L. Neralić, “Sensitivity Analysis of the Additive Model in Data Envelopment Analysis”, *European Journal of Operational Research*, Vol 48, No. 3, 1990, 332 - 341.
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- A. Charnes and L. Neralić, “Sensitivity Analysis in Data Envelopment Analysis 1”, *Glasnik Matematički Ser. III*, Vol. 24, No. 1, 1989, 211-226.
- L. Neralić, L. Szivoczka, D. Hunjet and S. Skok, “Multimodal Production-Transportation Problem with Capacity Constraints”, *Nafta*, Vol. 38, No. 1, 1987, 45-51. (In Croatian)
- L. Neralić, L. Szivoczka, S. Skok and D. Hunjet, “Solving the Production-Transportation Problem by Benders Decomposition”, *Economics and Mathematical Methods*, Vol. XX, No. 6, 1984, 1140-1143. (In Russian)
- L. Neralić, “Uncapacitated and Capacitated Plant Location Problems”, *Ekonomski pregled*, Vol. 34, No. 9-10, 1983, 387-394. (In Croatian)
- L. Neralić, “An Extended Production-Transportation Model for Oil Products”, *Nafta*, Vol. 31, No. 5, 1980, 267-271. (In Croatian)
- L. Neralić, “A Linear Static Model of the Production Program in an Oil Refinery”, *Nafta*, Vol. 26, No. 11, 1975, 593-598. (In Croatian)
- P. Grahovac, L. Neralić, B. Relić and V. Stipetić, “Projections and Nature of the Cyclic Trends in the Yugoslav Production of Hogs”, *Marketing*, No. 2, 1971, 22 - 30. (In Croatian)

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D. Hunjet, M. Milinović, L. Neralić and L. Szivoczka, "Production-Transportation Problem and Its Extensions", In: *Proceedings of the 9th International Conference on Operational Research* (K. Šorić, T. Hunjak and R. Scitovski, eds.), Croatian Operational Research Society, Osijek, 2003, pp. 73 - 81.

D. Hunjet, L. Neralić and B. Relić, "On Maximization of the Internal Rate of Return in the Choice of Independent Investment Projects", In: *Proceedings of the 9th International Conference on Operational Research* (K. Šorić, T. Hunjak and R. Scitovski, eds.), Croatian Operational Research Society, Osijek, 2003, pp. 67 - 71.

L. Neralić, "Perturbations of All Data in Models of Data Envelopment Analysis", In: *Proceedings of the 5th International Symposium on Operational Research* (V. Rupnik, L. Zadnik Stirn and S. Drobne, eds.), Slovenian Society Informatika, Section for Operational Research, Ljubljana, 1999, pp. 13 - 24.

L. Neralić and Z. Sikora, "An Application of Sensitivity Analysis in Data Envelopment Analysis", In: *Proceedings of the 7th International Conference on Operational Research* (I. Aganović, T. Hunjak and R. Scitovski, eds.), Croatian Operational Research Society, Osijek, 1998, pp. 17 - 22.

L. Neralić, "Sensitivity Analysis of the Additive Model in Data Envelopment Analysis II", In: *Proceedings of the 6th International Conference on Operational Research* (T. Hunjak, Lj. Martić and L. Neralić, eds.), Croatian Operational Research Society, Osijek, 1996, pp. 17 - 22.

L. Neralić, "Sensitivity Analysis of the Proportional Change of Outputs or/and Inputs of the Additive Model in Data Envelopment Analysis", In: *Proceedings of the International Conference "Restructuring Transitional Economies"* (S. Sharma and P. Sikavica, eds.), Book I, Faculty of Economics, Zagreb, 1995, pp. 221 - 233.

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L. Neralić, “Sensitivity Analysis of the Proportional Change of Outputs and Inputs of the Additive Model in Data Envelopment Analysis”, In: *Proceedings of the 2nd Conference on Operational Research* (V. Bahovec, Lj. Martić and L. Neralić, eds.), Croatian Operational Research Society, Zagreb, 1992, pp. 71 - 80. (In Croatian)

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L. Neralić, B. Relić and I. Raguz, “Comparative Efficiency Analysis of Selling Entities”, In: *Proceedings of the 1st Conference on Operational Research* (Lj. Martić and L. Neralić, eds.), Faculty of Economics, Zagreb, 1991, pp. 57-64. (In Croatian)

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A. Charnes and L. Neralić, “Sensitivity Analysis of the Simultaneous Change of Outputs and Inputs in Data Envelopment Analysis”, In: *Proceedings of the XIVth Yugoslav Symposium on Operational Research, SYM-OP-IS’87*, Herceg Novi, 1987, pp. 87-94. (In Croatian)

S. Skok, L. Neralić, D. Hunjet and L. Szivoczka, “An Algorithm for Solving the Production-Transportation Problem with Transshipment”, In: *Proceedings of the XIth Yugoslav Symposium on Operational Research, SYM-OP-IS’84*, Herceg Novi, 1984, pp. 753-758. (In Croatian)

L. Neralić and V. Vojvodić-Rosenzweig, “Method of Parametric Decomposition for Solving the Production-Transportation Problem”, In: *Proceedings of the Xth Yugoslav Symposium on Operational Research, SYM-OP-IS’83*, Herceg Novi, 1983, pp. 345-352. (In Croatian)

L. Neralić, J. Skorin-Kapov and L. Szivoczka, “An Application of the Multiplier Method”, In: *Proceedings of the VIIth Symposium on Information, Jahorina*, 1983, 277-1-5. (In Croatian)

L. Neralić and L. Szivoczka, “An Algorithm for Obtaining Lexicographically Positive Columns of the Matrix of Linear Integer Programming Problem”, In: *Proceedings of the IIIrd International Symposium “Computer at the University”*, Cavtat (Dubrovnik), 1981, 312.1-5. (In Croatian)

L. Neralić and L. Szivoczka, “Solving a Large Scale Linear Programming Problem”, In: *Proceedings of the IVth Symposium on Information, Jahorina*, 1980, 460-1-4. (In Croatian)

L. Neralić, J. Skorin-Kapov and L. Szivoczka, “Comparative Numerical Analysis of Two Methods in Mathematical Programming”, In: *Proceedings of the IIIrd Symposium on Information, Jahorina*, 1979, 305-1-10. (In Croatian)

L. Neralić and L. Szivoczka, “An Algorithm for Obtaining Basic from Non-

basic Solution of the Transportation Problem”, In: *Proceedings of the IXth Yugoslav Symposium “Automation of Data Processing”*, Zagreb, 1975, pp. 155-160. (In Croatian)

L. Neralić and B. Relić, “The Nature of Cycle in Hogs”, In: *Proceedings of the IIInd Symposium on Marketing Research of Meat and Milk*, Subotica, 1971, pp. 1 - 20. (In Croatian)

OTHER PUBLICATIONS

L. Neralić, In Memoriam prof. dr. sc. Ljubomiru Martiću (Knin, 4. 4. 1922. Zagreb, 19. 8. 2017.), *Glasnik Matematički*, Vol. 52(72), Prilozi, 2017., 482 - 492. (In Croatian)

L. Neralić (Editor), On the occasion of the 50th anniversary of the Seminary for Mathematical Programming and Game Theory, *Glasnik Matematički*, Vol. 51(71), Prilozi, 2016., 576 - 594. (In Croatian)

L. Nerali, In Memoriam academician Sibe Mardeić, *Glasnik Matematički*, Vol. 51(71), Prilozi, 2016., 625 - 627. (In Croatian)

L. Neralić, “In Memoriam prof. dr. sc. Krešo Horvatić, *Glasnik Matematički*, Vol. 43 (63), Prilozi, 2008., 559 - 560. (In Croatian)

L. Neralić (preparer), “The 15th Anniversary of the Croatian Operational Research Society, The 40th Anniversary of the Seminar for Mathematical Programming and Game Theory, The 85th Birthday of Professor Ljubomir Martić”, *Glasnik Matematički*, Vol. 42, 2007, Prilozi, 479-486. (In Croatian)

I. Ivanšić and L. Neralić, “In Memoriam prof. dr. sc. Stjepan Skok”, *Glasnik Matematički*, Vol. 41, Prilozi, 2006, 385-389. (In Croatian)

L. Neralić, ”In Memoriam Branko Relić (1942. - 2005.)”, *Ekonomski pregled*, God. 56, Br. 9, 2005, 773-782. (In Croatian)

L. Neralić, “On Linear Programming, IV, Part 2”, *Matematičko fizički list*, Vol. LVI, No. 4, 2005-2006, 251-258. (In Croatian)

L. Neralić, “On Linear Programming, IV, Part 1”, *Matematičko fizički list*, Vol. LVI, No. 3, 2005-2006, 170-176. (In Croatian)

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L. Neralić, “Celebration of the 80th birthday of Professor Ljubomir Martić”, *Ekonomski pregled*, God. 54, Br. 3-4, 2003, 393-404. (In Croatian)

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L. Neralić, “In memoriam: Ivan Franić (1950. - 1998.)”, *Glasnik Matematički* Vol. 33, No. 1, 1998, 133-135. (In Croatian)

L. Neralić and B. Relić, *Mathematics*, Neodidakta, Zagreb, 1996, Croatia. (In Croatian)

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A. Charnes and L. Neralić, "Sensitivity Analysis of the Simultaneous Proportionate Change of Inputs and Outputs in Data Envelopment Analysis", Research Report CCS 667, Center for Cybernetic Studies, The University of Texas at Austin, Texas, USA, August 1991.

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L. Neralić, “L. V. Kantorovič, *Economic Calculation of the Optimal Use of Resources*”, Centar za kulturnu djelatnost, Zagreb, 1985. (Translation from Russian, in Croatian)

K. Horvatić and L. Neralić, “Boltjanski, Efremovič: *What is Topology?*”, Školska knjiga, Zagreb, 1974. (Translation from Russian, in Croatian)

PRESENTATIONS AND LECTURES

“Evaluation of the Dynamic Efficiency of Croatian Towns Using Data Envelopment Analysis” (with D. Hunjet and R. E. Wendell), Central South University, Department of Management Science and Information Management, Changsha, China, June 1, 2016.

“An Application of Categorical Models of Data Envelopment Analysis” (with D. Hunjet and R. E. Wendell), Central South University, Department of Management Science and Information Management, Changsha, China, June 1, 2016.

“An Introduction to the CCR Model of Data Envelopment Analysis”, Jiangnan University, School of Business, Wuhan, China, November 2, 2015.

“Categorical Models of Data Envelopment Analysis”, Jiangnan University, School of Business, Wuhan, China, October 30, 2015.

“The Production-Transportation Problem in the Petroleum Industry and Its Extensions”, International Conference for Energy, Environment and Commercial Civilization, Sichuan University, Chengdu, China, October 23, 2015.

“Sensitivity Analysis of Input Relaxation Super Efficiency Measure in Data Envelopment Analysis” (with M. Khodabakhshi, S. Rashidi and M. Asgharian), The 15th International Conference on Operational Research KOI 2014, Osijek, Croatia, September 24-26, 2014.

“Sensitivity and Stability in Stochastic Data Envelopment Analysis” (with R. Banker and K. Kotarac), Renmin University of China, Beijing, China,

May 13, 2014.

“Sensitivity and Stability in Stochastic Data Envelopment Analysis” (with R. Banker and K. Kotarac), The University of Science and Technology, School of Management, Hefei, China, April 25, 2014.

“An Application of Window Analysis of Data Envelopment Analysis” (with D. Hunjet and R. E. Wendell), The 12th International Conference on Data Envelopment Analysis, Kuala Lumpur, Malaysia, April 14 to 17, 2014.

“An Application of Window Analysis of Data Envelopment Analysis” (with D. Hunjet and R. E. Wendell), The 26th European Conference on Operational Research EURO XXVI - INFORMS, Rome, Italy, 2013.

“Sensitivity and Stability in Stochastic Data Envelopment Analysis” (with R. D. Banker and K. Kotarac), The Eleventh International Conference on Data Envelopment Analysis DEA2013, Samsun, Turkey, 2013.

“An Application of Categorical Models of Data Envelopment Analysis” (with D. Hunjet and R. E. Wendell), Institut für Statistik und Operations Research, Social- und Wirtschaftswissenschaftliche Fakultät, Karl-Franzens-Universität Graz, Austria, 2013.

“An Application of Categorical Models of Data Envelopment Analysis” (with D. Hunjet and R. E. Wendell), The 25th European Conference on Operational Research EURO XXV, Vilnius, Lithuania, 2012.

“Preservation of Efficiency and Inefficiency Classification in Data Envelopment Analysis”, X International Seminar in Optimization and Related Areas (X ISORA), Lima, Peru, 2011.

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“Congestion in Stochastic Data Envelopment Analysis: An Input Relaxation Approach” (with M. Asgharian and M. Khodabakhshi), The Ninth International Conference on Data Envelopment Analysis DEA2011, Thessaloniki,

Greece, 2011.

“Congestion in Stochastic Data Envelopment Analysis: An Input Relaxation Approach” (with M. Asgharian and M. Khodabakhshi), The 24th European Conference on Operational Research EURO XXIV, Lisbon, Portugal, 2010.

“Sensitivity in Data Envelopment Analysis Using an Approximate Inverse Matrix” (with R. E. Wendell), The 23rd European Conference on Operational Research EURO XXIII, Bonn, Germany, 2009.

“Industrial Efficiency Assessment of the Counties of the Republic of Croatia” (with D. Hunjet and I. Turčić), The 12th International Conference on Operational Research KOI 2008, Pula, Croatia, 2008.

“Sensitivity Analysis of the Proportionate Change of a Subset of Outputs or/and Inputs in DEA” (with J. Guddat and O. Stein), The 18th Triennial Conference of the International Federation of Operational Research Societies IFORS 2008, Sandton, South Africa, 2008.

“Preservation of Efficiency and Inefficiency Classification in Data Envelopment Analysis”, The 4th Croatian Mathematical Congress, Osijek, Croatia, 2008.

“Data Envelopment Analysis and Discriminant Analysis in Efficiency Assessment of Agricultural Production” (with V. Bahovec), The 8th International Conference on Operations Research, Habana, Cuba, 2008.

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“Preservation of Efficiency and Inefficiency Classification in Data Envelopment Analysis”, The 22nd European Conference on Operational Research EURO XXII, Prague, Czech Republic, 2007.

“Preservation of Efficiency and Inefficiency Classification in Data Envelopment Analysis”, The Second International Conference on Optimization and Optimal Control, Ulanbaatar, Mongolia, 2007.

“Industrial Efficiency in Counties of the Republic of Croatia” (with D. Hunjet and I. Turčić), The 9th International Conference on Parametric Optimization and Related Topics PARAOPT IX, Cienfuegos, Cuba, 2007.

“Preservation of Efficiency and Inefficiency Classification in Data Envelopment Analysis”, The 8th International Symposium on Operational Research in Slovenia SOR '05, Nova Gorica, Slovenia, 2005.

“On Regular and Parametric Data Envelopment Analysis” (with O. Stein), The 23rd International Conference Mathematical Methods in Economics, Hradec Kralove, Czech Republic, 2005. (Invited plenary lecture)

“Sensitivity Analysis in Data Envelopment Analysis Using an Approximate Inverse Matrix” (with R. E. Wendell), Department of Mathematics, University of Duisburg, Germany, 2004.

“On Regular and Parametric Data Envelopment Analysis” (with O. Stein), III Colombian Congress and I International Andean Conference on Operations Research, Cartagena de Indias, Colombia, 2004.

“On Regular and Parametric Data Envelopment Analysis” (with O. Stein), The 7th International Conference on Approximation and Optimization in the Caribbean, Leon, Nicaragua, 2004.

“On Some New Results in Parametric Data Envelopment Analysis”, Research Seminar Optimization, Institut für Mathematik, Mathematisch-Naturwissenschaftliche Fakultät II, Humboldt-Universität zu Berlin, Germany, 2003.

“Production-Transportation Problem and Its Extensions” (with D. Hunjet, M. Milinović and L. Szivoczka), 9th International Conference on Operational Research KOI 2002, Trogir, Croatia, 2002.

“On Maximization of the Internal Rate of Return in the Choice of Independent Investment Projects” (with D. Hunjet and B. Relić), 9th International Conference on Operational Research KOI 2002, Trogir, Croatia, 2002.

“An Approach to Sensitivity in Data Envelopment Analysis”, Department

of Probability and Statistics, Faculty of Mathematics, Charles University, Prague, Czech Republic, 2002.

“Sensitivity in Data Envelopment Analysis Using an Approximate Inverse Matrix” (with R. E. Wendell), Faculty of Informatics and Statistics, University of Economics, Prague, Czech Republic, 2002.

“Sensitivity in Data Envelopment Analysis Using an Approximate Inverse Matrix” (with R. E. Wendell), Faculty of Informatics and Management, University of Hradec Králové, Hradec Králové, Czech Republic, 2002.

“Sensitivity in Data Envelopment Analysis Using an Approximate Inverse Matrix” (with R. E. Wendell), 7th International Conference on Parametric Optimization and Related Topics PARAOPT VII, Puebla, México, 2002.

“Preservation of Efficiency and Inefficiency Classification in Data Envelopment Analysis”, Faculty Seminar, Katz Graduate School of Business, University of Pittsburgh, USA, 2001.

“Preservation of Efficiency and Inefficiency Classification in Data Envelopment Analysis”, Sixth International Conference on Approximation and Optimization in the Caribbean, Guatemala City, Guatemala, 2001.

“Relative Efficiency of Agricultural Production in County Districts of Croatia” (with V. Bahovec), 8th International Conference on Operational Research KOI 2000, Rovinj, Croatia, 2000.

“An Approach to Sensitivity in Data Envelopment Analysis”, McGill Computational Science and Engineering Seminar, Department of Mathematics and Statistics, McGill University, Montreal, Canada, 2000.

“An Approach to Sensitivity in Data Envelopment Analysis”, Faculty of Management, McGill University, Montreal, Canada, 2000.

“A Generalized Additive, Categorical Model in Data Envelopment Analysis” (with R. E. Wendell), 17th European Conference on Operational Research EURO XVII, Budapest, Hungary, 2000.

“Sensitivity in Data Envelopment Analysis for Non-Negative Perturbations of Data”, Seminar on Optimization, Institut für Mathematik, Technische Universität Graz, Graz, Austria, 2000.

“On Regions of Efficiency in Data Envelopment Analysis”, 2nd Croatian Congress of Mathematics, Zagreb, Croatia, 2000.

“Evaluation of Robustness of Decision Making Units Using Dual Multipliers” (with V. Boljunčić), Sixth European Workshop on Efficiency and Productivity Analysis, Copenhagen, Denmark, 1999.

“A Semi-Infinite Programming Model in Data Envelopment Analysis“ (with A. Jess, H. Th Jongen and O. Stein - speaker), Sixth International Conference on Parametric Optimization and Related Topics, Dubrovnik, Croatia, 1999.

“Perturbations of All Data in Models of Data Envelopment Analysis”, 5th International Symposium on Operational Research, Preddvor, Slovenia, 1999.

“Sensitivity Analysis in Models of Data Envelopment Analysis”, Research Seminar Optimization, Institut für Mathematik, Mathematisch-Naturwissenschaftliche Fakultät II, Humboldt-Universität zu Berlin, Germany, 1998.

“Sensitivity Analysis in Models of Data Envelopment Analysis”, Fachbereich Mathematik , FernUniversität Hagen, Germany, 1998.

“Sensitivity Analysis of the Proportionate Change of a Subset of Inputs or/and Outputs in Data Envelopment Analysis”, Symposium “Data Envelopment Analysis - Recent Developments and Applications”, Hochschule Harz, Wernigerode, Germany, 1998.

“An Application of Sensitivity Analysis in Data Envelopment Analysis” (with Z. Sikora), The 7th International Conference on Operational Research KOI'98, Rovinj, Croatia, 1998.

“Sensitivity in DEA for Arbitrary Perturbations of Data in the Charnes-Cooper-Rhodes Model”, INFORMS International Israel, Tel Aviv, Israel, 1998.

“Relative Efficiency of Croatian Banks” (with I. Jemrić and B. Vujčić), INFORMS International Israel, Tel Aviv, Israel, 1998.

“Sensitivity Analysis of the Proportionate Change of a Subset of Inputs or/and Outputs in Data Envelopment Analysis”, Austrian-Croatian-Slovenian Workshop in Operations Research, Seggau, Austria, 1998.

“The State of Operational Research in the Republic of Croatia”, International Conference on Operations Research/Management Science and International Conference on Operations Research in Development ICORMS-ICORD 1997, Metro Manila, Philippines, 1997.

“Sensitivity in DEA for Arbitrary Perturbations of Data in the CCR Model”, Fifth International Conference on “Parametric Optimization and Related Topics” PARAOPT V, Tokio, Japan, 1997.

“Sensitivity in Data Envelopment Analysis for Arbitrary Perturbations of Data”, EURO XV - INFORMS XXXIV Joint International Meeting, Barcelona, Spain, 1997.

“An Analysis of Industrial Efficiency of the Republic of Croatia” (with D. Hunjet and I. Turčić), The 20th Meeting of the EURO Working Group on Financial Modelling, Dubrovnik, Croatia, 1997.

“Bank Branches Operating Efficiency Assessment Using DEA - An Application” (with Z. Sikora), The 20th Meeting of the EURO Working Group on Financial Modelling, Dubrovnik, Croatia, 1997.

“On Maximization of Internal Rate of Return” (with B. Relić and J. Skorin-Kapov), The 20th Meeting of the EURO Working Group on Financial Modelling, Dubrovnik, Croatia, 1997.

“LFS Functions in Multi-Objective Programming” (with S. Zlobec), 14th Triennial Conference on Operational Research, IFORS'96, Vancouver, B. C., Canada, 1996. (National Contribution of Croatian Operational Research Society)

“Sensitivity Analysis of the Proportionate Change of Inputs and/or Outputs with Different Coefficients of Proportionality in Data Envelopment Analysis” (with T. R. Sexton), International Conference Parametric Optimization and Related Topics IV, Enschede, The Netherlands, 1995.

“Sensitivity Analysis in Data Envelopment Analysis: A Review”, 2nd Slovenian Symposium on Operations Research, Portorož, Slovenia, 1994.

“Sensitivity Analysis in Data Envelopment Analysis” (with A. Charnes), Tutorial Lecture at the Sixtieth Symposium on Mathematical Programming with Data Perturbations, Anthony W. Fiacco, Organizer, The George Washington University, Washington, D. C., USA, 1994.

“Sensitivity Analysis in Data Envelopment Analysis for the Case of Discretionary Inputs and Outputs”, (with A. Charnes), Invited Session, EURO XII/TIMS XXXI Joint International Conference Operational Research/Management Science, Helsinki, Finland, 1992.

“Sensitivity Analysis of the Simultaneous Proportionate Change of Inputs and Outputs in Data Envelopment Analysis”, (with A. Charnes), International Conference Parametric Optimization and Related Topics III, Güstrow, Germany, 1991.

“Sensitivity Analysis of the Simultaneous Proportionate Change of Inputs and Outputs in Data Envelopment Analysis”, (with A. Charnes), 11th European Congress on Operational Research EURO XI, Aachen, Germany, 1991.

“Sensitivity Analysis of the Proportionate Change of Inputs (or Outputs) in Data Envelopment Analysis”, (with A. Charnes), 12th Triennial Conference on Operations Research, IFORS’90, Athens, Greece, 1990.

“Sensitivity Analysis in Data Envelopment Analysis”, (with A. Charnes), 6th Scientific Conference, Bratislava, Czecho-Slovakia, 1990.

“Sensitivity Analysis of the Additive Model in Data Envelopment Analysis”, (with A. Charnes), 10th European Conference on Operational Research EURO X, Belgrad, Yugoslavia, 1989.

“Sensitivity Analysis in Data Envelopment Analysis”, (with A. Charnes), EURO IX/TIMS XXVIII Joint International Conference Operational Research/New Technologies/Management Science, Paris, France, 1988.

“Sensitivity Analysis in DEA - Single Input and Single Output Changes”, (with A. Charnes), 19th Conference “Mathematical Optimization”, Sellin/Rügen, Germany, 1987.

“Solving the Production-Transportation Problem by Benders Decomposition”, (with D. Hunjet, S. Skok and L. Szirovicza), Department of Quantitative Methods, University of Illinois at Chicago, Chicago, IL, USA, 1985.

“Solving the Production-Transportation Problem by Benders Decomposition”, (with D. Hunjet, S. Skok and L. Szirovicza), Department of IEMS, Northwestern University, Evanston, IL, USA, 1985.

“Solving the Production-Transportation Problem by Benders Decomposition” (with D. Hunjet, S. Skok and L. Szirovicza), 11th International Symposium on Mathematical Programming, Bonn, Germany, 1982.

REFEREEING ACTIVITIES

Serves as a referee for **Annals of OR, Computers and Operations Research, European Journal of Operational Research, Journal of the Operational Research Society, Information Systems and Operational Research, Management Science, Journal of the Productivity Analysis, Mathematical Methods of OR, Revista de Matematica: Teoria y Aplicaciones, Informatica An International Journal of Computing and Informatics, Kybernetika, Central European Journal of Operations Research, Investigacion Operacional.**

PROFESSIONAL EXPERIENCE

June 19, 2015 - Professor Emeritus, Faculty of Economics and Business, University of Zagreb, Croatia

2002 - October 1, 2014 Full Professor (permanent position), Faculty of Economics and Business, University of Zagreb, Croatia

1998-2002 Full Professor, Faculty of Economics and Business, University of Zagreb, Croatia

1991-1998 Associate Professor, Faculty of Economics, University of Zagreb, Croatia.

1980-1991 Assistant Professor, Faculty of Economics, University of Zagreb, Croatia.

1967-1980 Teaching Assistant, Faculty of Economics, University of Zagreb, Croatia.

1966-1967 Teaching Assistant, Department of Mathematics, University of Zagreb, Croatia.

PROJECTS

1997-2014 **Models and methods of operational research in economics and business decision making**, Project of Croatian Ministry of Education and Sport, principal investigator.

1986-1996 **Quantitative methods in economic theory and practice**, Project of Croatian Ministry of Education and Sport, collaborator.

HONORS AND AWARDS

2017 **Life Time Contribution Award “William W. Cooper”**, International Data Envelopment Analysis Society (iDEAs).

2013 **“Award for Special Contribution to CRORS”**, Croatian Operational Research Society (CRORS).

2003 **Award “Mijo Mirković”**, University of Zagreb, Faculty of Economics and Business.

2002 **Visitante distinguido**, mayor of the city Puebla, Mexico.

1980 **Award “Mijo Mirković”**, University of Zagreb, Faculty of Economics and Business.

PROFESSIONAL MEMBERSHIP

A member of:
INFORMS (until 2014);
Croatian Operational Research Society;
Croatian Mathematical Society.

OTHER PROFESSIONAL ACTIVITIES

Guest Editor (with R. D. Banker and A. Emrouznejad) of a special issue of **the European Journal of Operational Research**, 2018.

Chairman, Program Committee of **the 14th International Conference on Operational Research KOI 2012**, Trogir, Croatia, 2012.

Chairman, Program Committee of **the 13th International Conference on Operational Research KOI 2010**, Split, Croatia, 2010.

Chairman, Program Committee of **the 12th International Conference on Operational Research KOI 2008**, Pula, Croatia, 2008.

Member, Organizing Committee of **the 22nd European Conference on Operational Research EURO XXII** , Prague, Czech Republic, 2007.

Chairman, Program Committee of **the 11th International Conference on Operational Research KOI 2006**, Pula, Croatia, 2006.

Co-editor, **Central European Journal of Operations Research**, 2007-2017.

Associate Editor, **The Data Envelopment Analysis Journal**, 2011- .

Guest Editor (with J. Guddat, H. Th. Jongen and S. Zlobec) of **the Special Issue of the journal *Optimization***, Vol. 49, No. 4 (2001).

Chairman, Organizing Committee and Member of Executive Committee, **The 6th International Conference on Parametric Optimization and Related Topics**, Dubrovnik, Croatia, October 4 - 8, 1999.

Organizer of **the 20th Meeting of the EURO Working Group on Financial Modelling**, Inter-University Centre, Dubrovnik, Croatia, April 24 - 26, 1997.

Past President, **Croatian Operational Research Society**, 1992 - 1996;
IFORS Representative of the **Croatian Operational Research Society**,
1994 - 2014 ;
EURO Representative of the **Croatian Operational Research Society**,
1994 - 2014 ;
Chairman, Program Committee for **the 6th International Conference
on Operational Research KOI'96**;
Chairman, Program Committee for **the 5th - the 2nd Conference on
Operational Research KOI'95 - KOI'92**;
Member, Publishing Counsel of "**Glasnik Matematički**", 1990 - 1994;
Past President, **The Society of Mathematicians and Physicists of
Croatia**, 1989 - 1990.

TEACHING EXPERIENCE

**University of Zagreb, Graduate Study "Leading and Control of
Movable Objects"**

Graduate course: Operational Research

University of Zagreb, Faculty of Economics

Graduate courses: Mathematical Programming
Nonlinear Programming
Introduction to Optimization

Undergraduate courses: Mathematics for Economists
Mathematics
Business Mathematics
Mathematical Programming
Nonlinear Programming
Linear Programming and Game Theory

University of Zagreb, Department of Mathematics

Graduate course: Operational Research

University of Texas at Austin, Department of Mathematics

Undergraduate course: Algebra and Trigonometry
(Spring Semester 1985/86)