

List of Publications

20 March 2024

Professor Ahti Salo
Systems Analysis Laboratory
Department of Mathematics and Systems Analysis
Aalto University School of Science
P.O. Box 11100, FIN-00076 Aalto
FINLAND
email: ahti.salo@aalto.fi

Refereed articles in international scientific journals

1. Buket, C., K. Barker, A.D. González and A. Salo, Two-Stage Stochastic Program for Environmental Resettlement Decision-Making, *Socio-Economic Planning Sciences* (forthcoming).
2. Salo, A., M. Doumpos, J. Liesiö and C. Zopounidis, Fifty Years of Portfolio Optimization, *European Journal of Operational Research* (forthcoming).
3. Roponen, J. and A. Salo, A Probabilistic Cross-Impact Methodology for Explorative Scenario Analysis, *Futures & Foresight Science* 6/1 (2024) e165.
4. Rintamäki, T., F. Oliveira, A. Siddiqui and A. Salo, Achieving Emission-Reduction Goals: Multi-Period Power-System Expansion under Short-Term Operational Uncertainty, *IEEE Transactions on Power Systems* 39/1 (2024) 119–131.
5. Salo, A., On the Boundaries of Experimental Research on Scenario Planning: Commentary on Derbyshire et al. (2022), *Futures & Foresight Science* 5/2 (2023) e152.
6. Champion, B.R., S.A. Gabriel and A. Salo, Risk-based, Multistage Stochastic Energy Project Selection, *Energy Systems* 14 (2023) 603–630.
7. Salo, A., J. Andelman and F. Oliveira, Decision Programming for Mixed-Integer Multi-Stage Optimization under Uncertainty, *European Journal of Operational Research* 299/2(2022) 550–565.
8. Salo, A., E. Tosoni, J. Roponen and D. Bunn, Using Cross-Impact Analysis for Probabilistic Risk Assessment, *Futures & Foresight Science* 4/2 (2022) e2103.
9. Hynninen, Y., E. Vilkkumaa and A. Salo, Operationalization of Utilitarian and Egalitarian Objectives for Optimal Allocation of Healthcare Resources, *Decision Sciences* 52/5 (2021) 1169–1208.
10. Könnölä, T., V. Eloranta, T. Turunen and A. Salo, Transformative Governance of Innovation Ecosystems, *Technological Forecasting and Social Change* 173 (2021) 121106.
11. Salo, A., Developing the Needed Scientific Theory Will Not Be Easy: Commentary on Fergnani and Chermack (2021), *Futures & Foresight Science* 3/3-4 (2021) e73.
12. Mancuso, A., M. Compare, A. Salo and E. Zio, Optimal Prognostics and Health Management-Driven Inspection and Maintenance Strategies for Industrial Systems, *Reliability Engineering and System Safety* 210 (2021) 107536.
13. Liesiö, J., A. Salo, J.M. Keisler and A. Morton, Portfolio Decision Analysis: Recent Developments and Future Prospects, *European Journal of Operational Research* 293/3 (2021) 811–825.

14. Chen, L., M. Guo, Y. Li, L. Liang and A. Salo, Efficiency Intervals, Rank Intervals and Dominance Relations of Decision-Making Units with Fixed-Sum Outputs, *European Journal of Operational Research* 292/1 (2021) 238–249.
15. Tosoni, E. A. Salo, J. Govaerts and E. Zio, Definition of the Data for Comprehensiveness in Scenario Analysis of Near-Surface Nuclear Waste Repositories, *Data in Brief* 31 (2020) 105780.
16. Virasjoki, V., A. Siddiqui, F. Oliveira and A. Salo, Utility-Scale Energy Storage in an Imperfectly Competitive Power Sector, *Energy Economics* 88 (2020) 104716.
17. Roponen, J., A. Salo and D. Rios Insua, Adversarial Risk Analysis under Partial Information, *European Journal of Operational Research* 287/1 (2020) 306–316.
18. Liesiö, J., J. Andelmin and A. Salo, Efficient Allocation of Resources to a Portfolio of Decision Making Units, *European Journal of Operational Research* 286/2 (2020) 619–636.
19. Rintamäki, T., A. Siddiqui and A. Salo, Strategic Offering of a Flexible Producer in Day-Ahead and Intraday Power Markets, *European Journal of Operational Research* 284/3 (2020) 1136–1153.
20. Baker, E., V. Bosetti and A. Salo, Robust Portfolio Decision Analysis: An Application to the Energy Research and Development Portfolio Problem, *European Journal of Operational Research* 284/3 (2020) 1107–1120.
21. Mancuso, A., M. Compare, A. Salo and E. Zio, Portfolio Optimization of Safety Measures for the Prevention of Time-Dependent Accident Scenarios, *Reliability Engineering and System Safety* 190 (2019) 106500, 1–9.
22. Mancuso, A., M. Compare, A. Salo and E. Zio, Probabilistic Model Data of Time-Dependent Accident Scenarios for a Mixing Tank Mechanical System, *Data in Brief* 25 (2019) 104243, 1–5.
23. Tosoni, E., A. Salo, J. Govaerts and E. Zio, Comprehensiveness of Scenarios in the Safety Assessment of Nuclear Waste Repositories, *Reliability Engineering and System Safety* 188 (2019) 561–573.
24. Virasjoki, V., A. Siddiqui, Z. Behnam and A. Salo, Market Power with Combined Heat and Power in the Nordic Energy System, *IEEE Transactions on Power Systems* 33/5 (2018) 5263–5275.
25. Kauppinen, L., A. Siddiqui and A. Salo, Investing in Time-to-Build Projects with Uncertain Revenues and Costs: A Real Options Approach, *IEEE Transactions on Engineering Management* 65/3 (2018) 448–459.
26. Tosoni, E., A. Salo and E. Zio, Scenario Analysis for the Safety Assessment of Nuclear Waste Repositories: A Critical Review, *Risk Analysis* 38/4 (2018) 755–776.
27. Cranmer, A., E. Baker, J. Liesiö and A. Salo, A Portfolio Model for Siting Offshore Wind Farms with Economic and Environmental Constraints, *European Journal of Operations Research* 267/1 (2018) 304–314.
28. Vilkkumaa, E., J. Liesiö, A. Salo and L. Ilmola-Sheppard, Scenario-based Portfolio Model for Building Robust and Proactive Strategies, *European Journal of Operational Research* 266/1 (2018) 205–220.
29. Kettunen, J. and A. Salo, Estimation of Downside Risks in Project Portfolio Selection, *Production and Operations Management* 26/10 (2017) 1839–1853.
30. Tervonen, T., J. Liesiö and A. Salo, Modelling Project Preferences in Multiattribute Portfolio Decision Analysis, *European Journal of Operational Research* 263/1 (2017) 225–239.
31. Mancuso, A., M. Compare, A. Salo and E. Zio, Portfolio Optimization of Safety Measures for Reducing Risks in Nuclear Systems, *Reliability Engineering and System Safety* 167 (2017) 20–29.
32. Toppila, A. and A. Salo, Selection of Risk Reduction Portfolios Under Interval-Valued Probabilities, *Reliability Engineering and System Safety* 163 (2017) 69–78.
33. Toppila, A. and A. Salo, Binary Decision Diagrams for Generating and Storing Non-Dominated Project Portfolios with Interval-Valued Project Scores, *European Journal of Operational Research* 260/1 (2017) 244–254.
34. Rintamäki, T., A. Siddiqui and A. Salo, Does Renewable Energy Generation Decrease the Volatility of Electricity Prices? An Analysis of Denmark and Germany, *Energy Economics* 62 (2017) 270–282.

35. Rintamäki, T., A. Siddiqui and A. Salo, How Much is Enough? Optimal Support Payments in a Renewable-Rich Power System, *Energy* 117, Part 1 (2016) 300–313.
36. Schang, L.K., Y. Hynnenen, A. Morton and A. Salo, Developing Robust Composite Measures of Healthcare Quality - Ranking Intervals and Dominance Relations for Scottish Health Boards, *Social Science & Medicine* 162 (2016) 59–67.
37. Mancuso, A., M. Compare, A. Salo, E. Zio and T. Laakso, Risk-Based Optimization of Pipe Inspections in Large Underground Networks with Imprecise Information, *Reliability Engineering and System Safety* 152 (2016) 228–238.
38. Virasjoki, V., P. Rocha, A.S. Siddiqui and A. Salo, Market Impacts of Energy Storage in a Transmission-Constrained Power System, *IEEE Transactions on Power Systems* 31/5 (2016) 4108–4117.
39. Chen, Y., Y. Li, L. Liang, A. Salo and H. Wu, Frontier Projection and Efficiency Decomposition in Two-Stage Processes with Slacks-Based Measures, *European Journal of Operational Research* 250/2 (2016) 543–554.
40. Roponen, J. and A. Salo, Adversarial Risk Analysis for Enhancing Combat Simulation Models, *Journal of Military Studies* 6/2 (2015) 133–148.
41. Mild, P., J. Liesiö and A. Salo, Selecting Infrastructure Maintenance Projects with Robust Portfolio Modeling, *Decision Support Systems* 77 (2015) 21–30.
42. Käki, A., A. Salo and S. Talluri, Disruptions in Supply Networks: A Probabilistic Risk Assessment Approach, *Journal of Business Logistics* 36/3 (2015) 273–287.
43. Vilkkumaa, E., A. Salo, J. Liesiö and A. Siddiqui, Fostering Breakthrough Technologies – How Do Optimal Funding Decisions Depend on Evaluation Accuracy? *Technological Forecasting and Social Change* 96 (2015) 173–190.
44. Käki, A., J. Liesiö, A. Salo and S. Talluri, Newsvendor Decisions Under Supply Uncertainty, *International Journal of Production Research* 53/5 (2015) 1544–1560.
45. Käki, A., A. Salo and S. Talluri, Scenario-Based Modeling of Interdependent Demand and Supply Uncertainties, *IEEE Transactions on Engineering Management* 61/1 (2014) 101–113.
46. Punkka, A. and A. Salo, Scale Dependence and Ranking Intervals in Additive Value Models Under Incomplete Preference Information, *Decision Analysis* 11/2 (2014) 83–104.
47. Kangaspunta, J. and A. Salo, Expert Judgments in the Cost-Effectiveness Analysis of Resource Allocations: A Case Study in Military Planning, *OR Spectrum* 36/1 (2014) 161–185.
48. Vilkkumaa, E., A. Salo and J. Liesiö, Multicriteria Portfolio Modelling for the Development of Shared Action Agendas, *Group Decision and Negotiation* 23/1 (2014) 49–70.
49. Vilkkumaa, E., J. Liesiö and A. Salo, Optimal Strategies for Selecting Project Portfolios Using Uncertain Value Estimates, *European Journal on Operational Research* 233/3 (2014) 772–783.
50. Käki, A., A. Salo and S. Talluri, Impact of the Shape of Demand Distribution in Decision Models for Operations Management, *Computers in Industry* 64/7 (2013) 765–775.
51. Toppila, A. and A. Salo, Prioritization of Events in Fault Tree Analysis Under Interval-Valued Probabilities, *IEEE Transactions on Reliability* 62/3 (2013) 583–595.
52. Punkka, A. and A. Salo, Preference Programming with Incomplete Ordinal Information, *European Journal on Operational Research* 231/1 (2013) 141–150.
53. Salo, A., A Seminar for Solving Client Problems in Project Teams, *INFORMS Transactions on Education* 13/1 (2012) 17–27.
54. Hytönen, H., T. Jarimo, A. Salo and E. Yli-Juuti, Markets for Standardized Technologies: Patent Licensing with Principle of Proportionality, *Technovation* 32/9-10 (2012) 897–912.
55. Kangaspunta, J., J. Liesiö and A. Salo, Cost-Efficiency Analysis of Weapon System Portfolios, *European Journal of Operational Research* 223/1 (2012) 264–275.

56. Könnölä, T., A. Salo, C. Cagnin, V. Carabias and E. Vilkkumaa, Facing the Future: Scanning, Synthesizing and Sense-Making in Horizon Scanning, *Science and Public Policy* 39/2 (2012) 222–231.
57. Liesiö, J. and A. Salo, Scenario-Based Portfolio Selection of Investment Projects with Incomplete Probability and Utility Information, *European Journal of Operational Research* 217/1 (2012) 162–172.
58. Brummer, V., A. Salo, J. Nissinen and J. Liesiö, A Methodology for the Identification of Prospective Collaboration Networks in International R&D Programs, *International Journal of Technology Management* 54/4 (2011) 369–389.
59. Könnölä, T., A. Salo and V. Brummer, Foresight for European Coordination: Developing National Priorities for the Forest-Based Sector Technology Platform, *International Journal of Technology Management* 54/4 (2011) 438–459.
60. Salo, A. and A. Punkka, Ranking Intervals and Dominance Relations for Ratio-Based Efficiency Analysis, *Management Science* 57/1 (2011) 200–214.
61. Kettunen, J., A. Salo and D. Bunn, Optimization of Electricity Retailer's Contract Portfolio Subject to Risk Preferences, *IEEE Transactions on Power Systems* 25/1 (2010) 117–128.
62. Salo, A., V. Brummer and T. Könnölä, Axes of Balance in Foresight – Reflections from FinnSight 2015, *Technology Analysis & Strategic Management* 21/8 (2009) 989–1003.
63. Mild, P. and A. Salo, Combining a Multiattribute Value Function with an Optimization Model: An Application to Dynamic Resource Allocation for Infrastructure Maintenance, *Decision Analysis* 6/3 (2009) 139–152.
64. Jarimo, T. and A. Salo, Multi-Criteria Partner Selection in Virtual Organisations with Transportation Costs and Other Network Interdependencies, *IEEE Transactions in Systems, Man, and Cybernetics - Part C: Applications and Reviews* 39/1 (2009) 124–129.
65. Liesiö, J., P. Mild and A. Salo, Robust Portfolio Modeling with Incomplete Cost Information and Project Interdependencies, *European Journal of Operational Research* 190/3 (2008) 679–695.
66. Brummer, V., T. Könnölä and A. Salo, Foresight within ERA-NETs: Experiences from the Preparation of an International Research Program, *Technological Forecasting and Social Change* 75/4 (2008) 483–495.
67. Lindstedt, M., J. Liesiö and A. Salo, Participatory Development of a Strategic Product Portfolio in a Telecommunication Company, *International Journal of Technology Management* 42/3 (2008) 250–266.
68. Liesiö, J., P. Mild and A. Salo, Preference Programming for Robust Portfolio Modeling and Project Selection, *European Journal of Operational Research* 181/3 (2007) 1488–1505.
69. Alanne, K., A. Salo, A. Saari and S.I. Gustafsson, Multi-Criteria Evaluation of Residential Energy Supply Systems, *Energy and Buildings* 39/12 (2007) 1218–1226.
70. Alanne, K., A. Saari and A. Salo, Comparative Analysis of the Life-Cycle Costs of Residential Energy Supply Technologies, *Nordic Journal of Surveying and Real Estate Research* 4/1 (2007) 23–44.
71. Könnölä, T., V. Brummer and A. Salo, Diversity in Foresight: Insights from the Fostering of Innovation Ideas, *Technological Forecasting and Social Change* 74/5 (2007) 608–626.
72. Salo, A., P. Mild and T. Pentikäinen, Exploring Causal Relationships in an Innovation Programme with Robust Portfolio Modeling, *Technological Forecasting and Social Change* 73/8 (2006) 1028–1044.
73. Salo, A. and J. Liesiö, A Case Study in Participatory Priority-Setting for a Scandinavian Research Programme, *International Journal of Information Technology & Decision Making* 5/1 (2006) 65–88.
74. Gustafsson, J. and A. Salo, Contingent Portfolio Programming for the Management of Risky Projects, *Operations Research* 53/6 (2005) 946–956.
75. Jarimo, T., U. Pulkkinen and A. Salo, Encouraging Suppliers to Process Innovations: A Game Theory Approach, *International Journal of Technological Intelligence and Planning* 1/4 (2005) 403–423.

76. Salo, A. and T. Käkölä, Groupware Support for Requirements Management in New Product Development, *Journal of Organizational Computing and Electronic Commerce* 15/4 (2005) 253–284.
77. Mustajoki, J., R.P. Hämäläinen and A. Salo, Decision Support by Interval SMART/SWING – Incorporating Imprecision in the SMART and SWING Methods, *Decision Sciences* 36/2 (2005) 317–339.
78. Ojanen, O., S. Makkonen and A. Salo, A Multi-Criteria Framework for the Selection of Risk Analysis Methods at Energy Utilities, *International Journal of Risk Assessment and Management* 5/1 (2005) 16–35.
79. Salo, A. and A. Punkka, Rank Inclusion in Criteria Hierarchies, *European Journal of Operational Research* 163/2 (2005) 338–356.
80. Salmenkaita, J.-P. and A. Salo, Emergent Foresight Processes: Industrial Activities in Wireless Communications, *Technological Forecasting and Social Change* 71/9 (2004) 897–912.
81. Salo, A. and T. Gustafsson, A Group Support System for Foresight Processes, *International Journal of Foresight and Innovation Policy* 1/3–4 (2004) 249–269.
82. Salo, A., T. Könnölä and M. Hjelt, Responsiveness in Foresight Management: Reflections from the Finnish Food and Drink Industry, *International Journal of Foresight and Innovation Policy* 1/1–2 (2004) 70–88.
83. Salo, A., T. Gustafsson and P. Mild, Prospective Evaluation of a Cluster Program for Finnish Forestry and Forest Industries, *International Transactions on Operations Research* 11/2 (2004) 139–154.
84. Technological Futures Analysis Methods Working Group (A.L. Porter, B. Ashton, G. Clar, J.F. Coates, K. Cuhls, S.W. Cunningham, K. Ducatel, P. van der Duin, L. Georghiou, T. Gordon, H. Linstone, V. Marchau, G. Massari, I. Miles, M. Mogee, A. Salo, F. Scapolo, R. Smits and W. Thissen), Technology Futures Analysis: Toward Integration of the Field & New Methods, *Technological Forecasting and Social Change* 71/3 (2004) 287–303.
85. Salo, A., T. Gustafsson and R. Ramanathan, Multicriteria Methods for Technology Foresight, *Journal of Forecasting* 22/2–3 (2003) 235–256.
86. Salo, A. and J.-P. Salmenkaita, Embedded Foresight in RTD Programs, *International Journal of Technology, Policy and Management* 2/2 (2002) 167–193.
87. Salmenkaita, J.-P. and A. Salo, Rationales for Government Intervention in the Commercialization of New Technologies, *Technology Analysis & Strategic Management* 14/2 (2002) 183–200.
88. Salo, A.A. and R.P. Hämäläinen, Preference Ratios in Multiattribute Evaluation (PRIME) – Elicitation and Decision Procedures under Incomplete Information, *IEEE Transactions on Systems, Man, and Cybernetics* 31/6 (2001) 533–545.
89. Salo, A. and O. Kuusi, Developments in Parliamentary Technology Assessment in Finland, *Science and Public Policy* 28/6 (2001) 453–464.
90. Salo, A.A., Incentives in Technology Foresight, *International Journal of Technology Management* 21/7–8 (2001) 694–710.
91. Salo, A.A. and R.P. Hämäläinen, On the Measurement of Preferences in the Analytic Hierarchy Process, *Journal of Multi-Criteria Decision Analysis* 6/6 (1997) 309–319.
92. Hämäläinen, R.P. and A.A. Salo, Rejoinder: The Issue is Understanding the Weights, *Journal of Multi-Criteria Decision Analysis* 6/6 (1997) 340–343.
93. Pöyhönen, M.A., R.P. Hämäläinen and A.A. Salo, An Experiment on the Numerical Modelling of Verbal Ratio Statements, *Journal of Multi-Criteria Decision Analysis* 6/1 (1997) 1–10.
94. Salo, A.A., Tighter Estimates for the Posteriors of Imprecise Prior and Conditional Probabilities, *IEEE Transactions in Systems, Man, and Cybernetics* 26/6 (1996) 820–825.
95. Salo, A.A., On Fuzzy Ratio Comparisons in Hierarchical Weighting Models, *Fuzzy Sets and Systems* 84 (1996) 21–32.

96. Bunn, D.W. and A.A. Salo, Adjustment of Forecasts with Model Consistent Expectations, *International Journal of Forecasting* 12/1 (1996) 163–170.
97. Salo, A.A., Interactive Decision Aiding for Group Decision Support, *European Journal of Operational Research* 84/1 (1995) 134–149.
98. Salo, A.A. and D.W. Bunn, Decomposition in the Assessment of Judgemental Probability Forecasts, *Technological Forecasting and Social Change* 49/1 (1995) 13–25.
99. Salo, A.A. and R.P. Hämäläinen, Preference Programming through Approximate Ratio Comparisons, *European Journal of Operational Research* 82/3 (1995) 458–475.
100. Salo, A.A. and M. Weber, Ambiguity Aversion in First-Price Sealed-Bid Auctions, *Journal of Risk and Uncertainty* 11/2 (1995) 123–137.
101. Salo, A.A., Inconsistency Analysis by Approximately Specified Priorities, *Mathematical and Computer Modelling* 17/4–5 (1993) 123–133.
102. Bunn, D.W. and A.A. Salo, Forecasting with Scenarios, *European Journal of Operational Research* 68/3 (1993) 291–303.
103. Salo, A.A. and R.P. Hämäläinen, Preference Assessment by Imprecise Ratio Statements, *Operations Research* 40/6 (1992) 1053–1061.
104. Salo, A. and R.P. Hämäläinen, Seteli – The Strategy Expert for Telecommunication Investments, *IEEE Expert* 5/5 (1990) 14–22.

Non-refereed articles in international scientific journals

105. Salo, A. and M.G. Speranza, Editorial, *EURO Journal on Decision Processes* 1/1–2 (2013) 1–3 (editorial to the inaugural issue).
106. Salo, A. and M. Makarow, Preface to the EURO Journal on Decision Processes, *EURO Journal on Decision Processes* 1/1–2 (2013) 5–6.
107. Demeulemeester, E., R. Kolisch and A. Salo, Project Management and Scheduling, *Flexible Services and Manufacturing Journal* 25/1–2 (2013) 1–5 (preface to the special issue on project management and scheduling).
108. L.R. Keller, A. Abbas, J.E. Bickel, V.M. Bier, D.V. Budescu, J.C. Butler, P. Delquié, K.C. Lichtendahl, Jr., J.R.W. Merrick, A. Salo and G. Wu, From the Editors—Probability Scoring Rules, Ambiguity, Multiattribute Terrorist Utility, and Sensitivity Analysis, *Decision Analysis* 8/4 (2011) 251–255.
109. Keller, L.R., A. Abbas, M. Baucells, V.M. Bier, D. Budescu, J.C. Butler, P. Delquié, J.R.W. Merrick, A. Salo and G. Wu, From the Editors..., *Decision Analysis* 7/4 (2010) 327–330.
110. Keller, L.R., M. Baucells, J.C. Butler, P. Delquié, J.R.W. Merrick, G.S. Parnell and A. Salo, From the Editors..., *Decision Analysis* 6/4 (2009) 199–201.
111. Keller, L.R., M. Baucells, J.C. Butler, P. Delquié, J.R.W. Merrick, G.S. Parnell and A. Salo, From the Editors..., *Decision Analysis* 5/4 (2008) 173–176.
112. Keller, L.R., M. Baucells, K.F. McCardle, G.S. Parnell and A. Salo, From the Editors..., *Decision Analysis* 4/4 (2007) 173–175.
113. Salo, A. and K. Cuhls, Technology Foresight – Past and Future, *Journal of Forecasting* 22/2–3 (2003) 79–82 (preface to the special issue on technology foresight).

Edited books

114. Salo, A., J. Keisler and A. Morton (eds), *Portfolio Decision Analysis: Methods for Improved Resource Allocation*, Springer International Series in Operations Research & Management Science, Vol. 162, Springer, New York, 2011. 409 p.

Articles in books

115. Salo, A., R.P. Hämäläinen and T.J. Lahtinen, Multicriteria Methods for Group Decision Processes: An Overview, in: D.M. Kilgour and C. Eden (eds.), *Handbook of Group Decision and Negotiation*, 2nd edition, Springer, Cham, 2021. 29 p.
116. Salo, A., Perspectives into Future-Oriented Technology Analysis (published in Spanish), in: F. Andres, D. Rios (eds.), *El analista de inteligencia en la era digital*, National Intelligence Centre (CNI) of Spain, 2020.
117. Morton, A., J.M. Keisler and A. Salo, Multicriteria Portfolio Decision Analysis for Project Selection, in: S. Greco, M. Ehrgott and R.J. Figueira (eds.), *Multiple Criteria Decision Analysis: State of the Art Surveys*, Springer International Series in Operations Research & Management Science, Vol. 233, Springer, New York, 2016, 1269–1298.
118. Salo, A., J. Keisler and A. Morton, An Invitation to Portfolio Decision Analysis, in: A. Salo, J. Keisler and A. Morton (eds.), *Portfolio Decision Analysis – Improved Methods for Resource Allocation*, Springer International Series in Operations Research & Management Science, Vol. 162, Springer, New York, 2011, 3–27.
119. Gustafsson, J., B. De Reyck, Z. Degraeve and A. Salo, Valuation of Risky Projects and Illiquid Investments Using Portfolio Selection Models, in: A. Salo, J. Keisler and A. Morton (eds.), *Portfolio Decision Analysis: Improved Methods for Resource Allocation*, Springer International Series in Operations Research & Management Science, Vol. 162, Springer, New York, 2011, 79–105.
120. Toppila, A., J. Liesiö and A. Salo, A Resource Allocation Model R&D Investments – A Case Study in Telecommunication Standardization, in: A. Salo, J. Keisler and A. Morton (eds.), *Portfolio Decision Analysis: Improved Methods for Resource Allocation*, Springer International Series in Operations Research & Management Science, Vol. 162, Springer, New York, 2011, 241–258.
121. Salo, A. and R.P. Hämäläinen, Multicriteria Decision Analysis in Group Decision Processes, in: D.M. Kilgour and C. Eden (eds.), *Handbook of Group Decision and Negotiation*, Springer, New York, 2010, 269–283.
122. Salo, A. and R.P. Hämäläinen, Preference Programming – Multicriteria Weighting Models under Incomplete Information, in: C. Zopounidis and P.M. Pardalos (eds.), *Handbook of Multicriteria Decision Analysis*, Springer, New York, 2010, 167–187.
123. Gustafsson, J., A. Salo and T. Gustafsson, PRIME Decisions: An Interactive Tool for Value Tree Analysis, in: M. Köksalan and S. Zionts (eds.), *Multiple Criteria Decision Making in the New Millennium*, Lecture Notes in Economics and Mathematical Systems 507, Springer-Verlag, Berlin, 2001, 165–176.
124. Salo, A. Teknologian arvointi ja ennakoointi (Technology Assessment and Technology Foresight), in: T. Lemola (ed.), *Teknologia ja yhteiskunnan muutos (Technology and Societal Transformation)*, Gaudeamus, Helsinki, 2000, 193–217.
125. Salo, A., Technology Foresight for Institutional Learning, in: G. Schienstock and O. Kuusi (eds.), *Transformation Towards a Learning Economy: Challenges for the Finnish Innovation System*, SITRA 213, Helsinki, 1999, 385–394.
126. Salo, A. and R.P. Hämäläinen, Processing Interval Judgments in the Analytic Hierarchy Process, in: A. Goicoechea, L. Duckstein and S. Zionts (eds.), *Multiple Criteria Decision Making*, Springer-Verlag, New York, 1992, 359–372.

127. Salo, A. and R.P. Hämäläinen, Decision Support in an Artificial Intelligence Environment, in: P. Korhonen, A. Lewandowski and J. Wallenius (eds.), *Multiple Criteria Decision Support*, Lecture Notes in Economics and Mathematical Systems 356, Springer-Verlag, Berlin, 1990, 183–190.

Conference papers

128. Weber, K.M., K. Cuhls, A. Havas and A. Salo, Embedded and Performative Foresight for STI Policies. *Proceedings of EU-SPRI 2021: Science and Innovation - An Uneasy Relationship? Rethinking the Roles and Relations of STI policies*, Oslo, Norway, June 9–11, 2021.
129. Havas, A., A. Salo and M. Weber, FTA for Strategic STI Policies in a Multi-Level, Multi-Domain Governance Context, *The Joint Research Centre (JRC) Future-Oriented Technology Analysis Conference FTA2018–Future in the Making*, Brussels, Belgium, June 4–5, 2018.
130. Mancuso, A., M. Compare, A. Salo, E. Zio, Risk-Informed Decision Making under Incomplete Information: Portfolio Decision Analysis and Credal Networks, in: M. Cepin and R. Bris (eds.), *Safety and Reliability: Theory and Applications – Proceedings of the 27th European Safety and Reliability Conference: ESREL 2017*, CRC Press, 743–750.
131. Kauppinen, L., A. Salo and A. Siddiqui, The Impact of Uncertain Revenues and Costs on Time-to-Build, *Proceedings of the 20th Real Options Annual Conference*, Oslo and Trondheim, Norway, June 15–18, 2016.
132. Compare, M., A. Mancuso, T. Laakso, A. Salo and E. Zio, Identification of the Most Critical Pipes in the Presence of Imprecise Information, in: L. Podofillini, B. Sudret, B. Stojadinovic, E. Zio, W. Kröger (eds.), *Safety and Reliability of Complex Engineered Systems: ESREL 2015*, CRC Press (ISBN 9781138028791), 2717–2722.
133. A. Toppila and A. Salo, Prioritizing Failure Events in Fault Tree Analysis Using Interval-valued Probability Estimates, *Proceedings of the International Conference on Probabilistic Safety Assessment and Management & Annual European Safety and Reliability Conference*, Helsinki, Finland, June 25–29, 2012. 10 p.
134. Könnölä, T., A. Salo, C. Cagnin, V. Carabias and E. Vilkkumaa, Facing the Future: Scanning, Synthesizing and Sense-Making in Horizon Scanning, *Fourth International Seville Conference on Future-Oriented Technology Analysis*, Seville, Spain, May 12–13, 2011. 20 p.
135. Käki, A. and A. Salo, Impacts of the Shape of the Demand Distribution on Procurement Risk Mitigation, *Proceedings of the 22nd Annual Production and Operations Management (POMS) Conference*, Reno Nevada, USA, April 29–May 2, 2011. 15 p.
136. Käki, A. and A. Salo, Evaluating Procurement Strategies under Uncertain Demand and Risk of Component Unavailability, in: B. Hu, K. Morasch, S. Pickl, M. Siegle (eds.), *Operations Research Proceedings 2010: Annual International Conference of the German-Operations-Research-Society (GOR)*, Neubiberg, Germany, September 1–3, 2010. Springer-Verlag (ISBN 978-3-642-20009-0), 441–446.
137. Brummer, V., A. Salo and M. Ollila, Balancing Incentives in Thematic Priority Setting for Collaborative Innovation Networks, *Proceedings of the Fourth European Conference on Management of Technology*, Glasgow, United Kingdom, September 6–8, 2009. 15 p.
138. Salo, A., V. Brummer and T. Könnölä, Finnsight 2015 – A Foresight Exercise for the Shaping of National Strategies, *Third International Seville Seminar on Future-Oriented Technology Analysis: Impacts and Implications for Policy and Decision-Making*, Seville, Spain, October 16–17, 2008. 17 p.
139. Mild, P., A. Salo, Multi-Criteria Tools for Asset Management at the Finnish Road Administration, *Proceedings of Transport Research Arena Europe 2008*, Ljubljana, Slovenia, April 21–24, 2008. 7 p.
140. Kettunen, J., Y. Grushka-Cockayne, B. De Reyck, Z. Degraeve and A. Salo, Management of New Product Development: The Impact of Competition and Market Characteristics, *Proceedings of the Eleventh*

International Workshop on Project Management and Scheduling, Istanbul, Turkey, April 28–30, 2008, 169–172.

141. Salo, A., Robust Portfolio Modelling, in: R. Lahdelma, K. Miettinen, P. Salminen and A. Salo (eds.) *Proceedings of the 67th Meeting of the European Working Group Multiple Criteria Decision Making*, University of Jyväskylä, Reports of the Department of Mathematical Information Technology, No. A 1/2008, 72–76.
142. Renjish Kumar, K.R., I. Hirvonen, I. Leppänen, T. Kuronen, J.K. Nurminen and A. Salo, An Evaluation Model for the End-user Utility of Office Applications, *Proceedings of the Ninth IASTED Conference on Software Engineering and Applications*, ACTA Press, Phoenix Arizona, USA, November 14–16, 2005. 7 p.
143. Könnölä, T., V. Brummer and A. Salo, Adopting Diverse Perspectives in the Fostering of Innovation Ideas, *Proceedings of New Visions for Sustainability: the 7th Annual International Conference on Foresight Management in Corporations and Public Organisations*, Statistics Finland, Helsinki, June 9–10, 2005.
144. Salo, A., R. Gustafsson, I. Kaakkolammi and T. Gustafsson, Participatory Development of Future-Oriented Policy Configurations for Climate Change and Mobile Gaming, *New Horizons and Challenges for Future-oriented Technology Analysis*, *Proceedings of the EU-US Scientific Seminar: New Technology Foresight, Forecasting and Assessment Methods*, Seville, May 13–14, 2004. European Commission, Joint Research Centre, Technical Report Series EUR 21473 EN.
145. Salo, A., Filtering of Themes in the Committee for the Future, in: C. Cuhls and M. Jaspers (eds.), *Proceedings of the International Expert Workshop on Participatory Priority Setting for Research and Innovation Policy*, Fraunhofer IRB Verlag, Berlin, December 2002, 48–53.
146. Gustafsson, T. and A. Salo, Designing Group Support for Foresight Processes, in: F. Ackermann and G.-J. de Vreede (eds.), *Proceedings of Group Decision & Negotiation 2001*, La Rochelle, June 2001, 173–175.
147. Gustafsson, J. and A. Salo, Scenario-Based Appraisal of R&D Projects with Contingent Portfolio Programming, in: F. Ackermann and G.-J. de Vreede (eds.), *Proceedings of Group Decision & Negotiation 2001*, La Rochelle, June 2001, 177–178.
148. Salo, A., Finland – Embedding Foresight into RTD Programmes, *Foresight at Crossroads: Technology Foresight Linking Innovation to Informed Action*. Ministry of Trade and Industry, Helsinki, November 1999, 40–49.
149. Salo, A. and T. Käkölä, A Groupware Architecture for Requirements Processes in New Product Development, *Proceedings of the Thirty-Second Hawaii International Conference on System Sciences*, IEEE Computer Society Press, Hawaii, January 1999.
150. Salo, A. and T. Käkölä, Requirements for Groupware-Supported Requirements Processes in New Product Development. *Proceedings of Fourth International Workshop on Requirements Engineering: Foundation for Software Quality (REFSQ '98)*, (Pisa, Italy, June 1998). Presses Universitaires de Namur, Belgium, 99–112.
151. Salo, A., Groupware-Assisted Requirements Assessment. *Proceedings of the Third IEEE International Symposium on Requirements Engineering (RE'97)*. Annapolis Maryland, USA, January 1997. IEEE Computer Society Press, Los Alamitos, CA, 40.
152. Hämäläinen, R.P., A.A. Salo and K. Pöysti, Observations about Consensus Seeking in a Multiple Criteria Environment, *Proceedings of the Twenty-Fifth Hawaii International Conference on System Sciences*, Vol. IV, Hawaii, January 1992, 190–198.
153. Salo, A. and R.P. Hämäläinen, Perspectives on Decision Support and Artificial Intelligence, *Proceedings of the Ninth IASTED International Symposium Applied Informatics*, Innsbruck, Austria, February 1991, 220–223.
154. Salo, A. and R.P. Hämäläinen, Decision Support under Ambiguous Preference Statements, *Proceedings of the Annual Conference of the Operational Research Society of Italy*, Sorrento, Italy, October 1990, 229–243.

155. Salo, A. and R.P. Hämäläinen, A Modelling and Decision Aid for Supporting Telecommunications Investments, *Proceedings of the 1989 IEEE International Conference on Systems, Man, and Cybernetics*, Vol. I, Cambridge Massachusetts, November 1989, 115–119.
156. Salo, A. and R.P. Hämäläinen, Supporting Telecommunications Planning - The SETELI Case, *Proceedings of the Finnish Artificial Intelligence Symposium*, Vol. I, Helsinki, August 1989, 160–166.
157. Salo, A. and R.P. Hämäläinen, Supporting Telecommunications Planning - The SETELI Case, *Proceedings of the RACE Main Workshop on Techno-Economic Tools*, Analysys Ltd., Cambridge, United Kingdom, June 1988, 294–298.

Articles and research reports in Finnish

158. Laatikainen, T. , O. Vapalahti, M. Kalland, J. Välijärvi, M. Huotilainen, C. Salmivalli, A. Salo, H. Hiilamo, S. Kuivalainen, E. Pekkarinen, J. Niemi, J. Välimäki and M. Ollikainen, COVID-19 -kriisin haitallisten vaikutusten ehkäiseminen kestävän kehityksen periaatteiden mukaisesti: tiedepaneelin vastaukset valmisteluryhmän kysymyksiin (Preventing the Harmful Consequences of the COVID-19 Crisis in Accordance with the Principles of Sustainable Development: Responses by the COVID-19 Science Panel to Questions of the Working Group of the Prime Minister's Office). Report of the Government's COVID-19 Science Panel, 1 June 2020. Available at [checked 1 July 2020]
https://valtioneuvosto.fi/documents/10616/21411573/VNK_Tiedepaneelin_raportti_200601.pdf
159. Vilkkumaa, E. and A. Salo, Radikaalien innovaatioiden rahoituskäytännöt: Tiivistelmä tutkimuksesta (Principles of Funding of Radical Innovations: A Summary of Research), in T. Luukkonen (ed.), Universities, Funding Systems, and the Renewal of the Industrial Knowledge Base: UNI Project Findings. ETLA - The Research Institute of the Finnish Economy, ETLA Reports of the Finnish Economy No. 33, 2014, 59–64.
160. Kangaspunta, J., E. Lappi, A. Salo and J. Liesiö, Asejärjestelmien kustannustehokkuuden arvointi simulointi- ja systeemianalyysimenetelmin (Cost-Efficiency Analysis of Weapons Systems with Simulation and Systems Analytic Method). Tiede ja ase, Suomen Sotatieteellisen Seuran vuosijulkaisu n:o 66 (Annual Report of the Finnish Society of Military Sciences), 2008, 257–269.
161. Salo, A., V. Brummer and T. Könnölä, Innovaatioaihioiden portfolioanalyysi KTM:n ennakkointiforumissa (Portfolio Analysis of Innovation Ideas in the Foresight Forum of the Ministry of Trade and Industry). Futura 2–3/2005 (special issue on mathematical modelling in futures research), 58–67.
162. Salo, A., Ennakoinnista ja sen kehittämisestä (On the Development of Foresight Activities). In: Valtioneuvoston ennakkointiverkosto ja ennakkointi ministeriöissä (Foresight Network of the Government and Foresight at Finnish Ministries). Report of the Foresight Network of the Government 1/2005, 29–32.
163. Salo, A., Ennakointi ja tulevaisuuskuvat tutkimus- ja kehittämishojelmissa (Future Scenarios in Research and Development Programmes). Research reports of the Ministry of Trade and Industry 18/2003. 63 p.
164. Salo, A., Arvio teknologian ennakoinnin kehittämistarpeista (A Needs Assessment of Technology Foresight). Research reports of the Ministry of Trade and Industry 2/2001. 76 p.
165. Salo, A., V. Kauppinen and M. Rask, Loppuraportti kasvigeeniteknikasta (Final Report on Plant Gene Technology). Technology Section of the Futures Committee, Technology Assessments 3, Secretariat of the Parliament 4/1998. 199 p.
166. Salo, A., J. Kauppila and J. Salminiitty, Elintarviketeollisuuden teknologiset menestystekijät (Technological Success Factors of the Finnish Food and Drink Industry). Technology Programme Report 60/98, Tekes, 1998. 71 p.
167. Salo, A. and V. Kauppinen, Esiselvitys kasvigeeniteknikasta (Prestudy on Plant Gene Technology). Technology Section of the Futures Committee, Technology Assessments 1, Secretariat of the Parliament 3/1997. 125 p.

Research reports in English

168. Liesiö, J. and A. Salo, Scenario-Based Portfolio Selection of Investment Projects with Incomplete Probability and Utility Information, Helsinki University of Technology, Systems Analysis Laboratory, Research Report E23, October 2008.¹
169. Hytönen, H., T. Jarimo, A. Salo and E. Yli-Juuti, Markets for Standardized Technologies: Patent Licensing with Principle of Proportionality, Helsinki University of Technology, Systems Analysis Laboratory, Research Report E21, May 2008.²
170. Könnölä, T., V. Brummer and A. Salo, Diversity in Foresight: Insights from the Fostering of Innovation Ideas, Helsinki University of Technology, Systems Analysis Laboratory, Research Report E19, May 2006.³
171. Gustafsson, J. and A. Salo, Valuing Risky Projects with Contingent Portfolio Programming, Helsinki University of Technology, Systems Analysis Laboratory, Research Report E18, June 2005.
172. Gustafsson, J. and A. Salo, Project Valuation under Ambiguity, Helsinki University of Technology, Systems Analysis Laboratory, Research Reports E17, June 2005.
173. Gustafsson, J., B. De Reyck, Z. Degraeve and A. Salo, Project Valuation in Mixed Asset Portfolio Selection, Helsinki University of Technology, Systems Analysis Laboratory, Research Reports E16, June 2005.⁴
174. Salo, A., P. Utunen, J. Lievonen, T. Gustafsson and P. Mild, *Results from the Self-Evaluation Process*, Finnish Forest Cluster Research Programme Wood Wisdom (1998-2001), Helsinki, August 2002, 79 p.
175. Salo, A., Concluding Remarks on Strategic Intelligence, in: A. Tübke, K. Ducatel, J.P. Gavigan. P. Moncado-Paternò-Castello (eds.), *Strategic Policy Intelligence: Current Trends, the State of Play and Perspectives*, Institute of Prospective Technological Studies, Joint Research Centre of the European Commission, December 2001, 65-72.
176. Salo, A., On the Role of Decision Analytic Modelling, in: A. Stirling (ed.), *On Science and Precaution in the Management of Technological Risk, Vol. II*, Institute of Prospective Technological Studies, Joint Research Centre of the European Commission, Report EUR 19056/EN/2, November 2001, 123-141.
177. Salmenkaita, J.-P. and A. Salo, Rationales for government intervention in the commercialization of new technologies, Helsinki University of Technology, Systems Analysis Laboratory, Research Reports E8, June 2005.⁵
178. Salo, A.A., K. Pahlavan and J.-P. Salmenkaita, *R&D Programmes in Electronics and Telecommunication: ETX, TLX, INWITE and Electronics*, Technology Programme Report 5/2000, Tekes. 95 p.
179. Kyriakou, D., A. Salo, J.C. Císcar and J. Lievonen (eds.), *Techno-Economic Analysis Report – 1998*, Institute of Prospective Technological Studies, Joint Research Centre of the European Commission, June 1999, EUR 18964 EN. 100 p.
180. Salo, A.A., Chapter on Finland in: H. Schaffers (ed.), *The Strategic Position of Technology Research Organisation in Europe: Energy, Aerospace and Marine Technology*, The Advisory Council on Science and Technology Policy (AWT) of the Netherlands, Background study no. 11, 1998, 59–66.
181. Salo, A.A., D. Kyriakou, J.S. Císcar and H. Luukkanen (eds.), *Techno-Economic Analysis Report – Baseline 1997*, Institute of Prospective Technological Studies, Joint Research Centre of the European Commission, August 1998. 54 p.

¹ The revised version has appeared as a journal article.

² The revised version has appeared as a journal article.

³ The revised version has appeared as a journal article.

⁴ The revised version has appeared as a book chapter.

⁵ The revised version has appeared as a journal article.

182. Salo, A.A. and M. Weber, Ambiguity Aversion in First-Price Sealed-Bid Auctions, *Arbeitsbericht* 94-07, Lehrstühle für Finanzwirtschaft, Universität Mannheim, 1994.⁶
183. Salo, A.A. and M. Weber, Vickrey Auctions under Choquet Expected Utility Theory, *Arbeitsbericht* 94-06, Lehrstühle für Finanzwirtschaft, Universität Mannheim, 1994.
184. Pöyhönen, M.A., R.P. Hämäläinen and A.A. Salo, An Experiment on the Numerical Modeling of Verbal Ratio Statements, Helsinki University of Technology, Systems Analysis Laboratory, Research Report A50, January 1994.⁷
185. Salo, A.A. and R.P. Hämäläinen, On the Measurement of Preferences in the Analytic Hierarchy Process, Helsinki University of Technology, Systems Analysis Laboratory, Research Report A47, March 1993.⁸
186. Salo, A.A., Approximate Ratio Statements in Hierarchical Weighting Models, Helsinki University of Technology, Systems Analysis Laboratory, Research Report A46, November 1992.
187. Salo, A.A. and R.P. Hämäläinen, Rank Reversals in the Feedback Technique of the Analytic Hierarchy Process, Helsinki University of Technology, Systems Analysis Laboratory, Research Report A45, August 1992.
188. Salo, A.A., Holistic Comparisons in Hierarchical Weighting, Helsinki University of Technology, Systems Analysis Laboratory, Research Report A44, July 1992.
189. Salo, A.A. and R.P. Hämäläinen, PRIME - Preference Ratios in Multiattribute Evaluation, Helsinki University of Technology, Systems Analysis Laboratory, Research Report A43, July 1992.⁹
190. Salo, A. and R.P. Hämäläinen, Ambiguous Preference Statements in the Analytic Hierarchy Process, Helsinki University of Technology, Systems Analysis Laboratory, Research Report A39, June 1991.¹⁰

Working papers

191. Salo, A. Kokemuksia teknologian arvioinnista: kasviveenitekniikka ravinnontuotannossa (Lessons from Technology Assessment: Plant Gene Technology in Food Production). VTT Group for Technology Studies, Working Papers 37/98, 1998. 26 p.

⁶ The revised version has appeared as a journal article.

⁷ The revised version has appeared as a journal article.

⁸ The revised version has appeared as a journal article.

⁹ The revised version has appeared as a journal article.

¹⁰ The revised version has appeared as a journal article.