List of Publications

Timo Tiihonen
Faculty of Information Technology
P.O. Box 35 (Agora)
FI–40014 University of Jyväskylä, Finland

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A Refereed articles

1. J. Haslinger, P. Neittanmäki, and T. Tiihonen. Shape optimization of an elastic body in contact based on penalization of the state. *Apl. Math.*, 31:54–77, 1986.
2. J. Haslinger, P. Neittanmäki, A. Kaarna, and T. Tiihonen. Optimal shape control of the domain in unilateral boundary value problems: Part I. Abstract setting and Dirichlet-Signorini problem. *Optim. control appl. methods*, 9:127–144, 1988.
3. J. Haslinger, P. Neittanmäki, A. Kaarna, and T. Tiihonen. Optimal shape control of the domain in unilateral boundary value problems: Part II. Design of an elastic body in contact with rigid support. *Optim. control appl. methods*, 9:145–164, 1988.
4. T. Tiihonen and R. Pietikäinen. Thermal deformations of inhomogenous elastic plates. *Mathematical Methods in the Applied Sciences*, 18:423–436, 1995.
5. T. Tiihonen. Stefan-Boltzmann radiation on non-convex surfaces. *Mathematical Methods in the Applied Sciences*, 20:47–57, 1997.
6. T. Tiihonen. Shape optimization and trial methods for free boundary problems. *Mathematical Modelling and Numerical Analysis*, 31:805–825, 1997.
7. T. Tiihonen. A nonlocal problem arising from heat radiation on non-convex surfaces. *European Journal of Applied Mathematics*, 8:403–416, 1997.
8. J. Järvinen, R. Nieminen, and T. Tiihonen. Time-dependent simulation of Czochralski silicon crystal growth. *Journal of Crystal Growth*, 180:468–476, 1997.
9. M. Laitinen and T. Tiihonen. Heat transfer in conducting and radiating bodies. *Appl. Math. Letters*, 10(5):5–8, 1997.
10. M. Laitinen and T. Tiihonen. Integro-differential eguation modelling heat transfer in conducting, radiating and semitransparent materials. *Mathematical Methods in the Applied Sciences*, 21:375–392, 1998.
11. T. Tiihonen. Finite element approximation of non-local heat radiation problems. *Mathematical Models and Methods in the Applied Sciences*, 8:1071–1089, 1998.
12. T. Tiihonen. Fixed point methods for internal free boundary problem. *Num. Funct. Anal. Optim.*, 19(3/4):399–413, 1998.
13. K. Kärkkäinen and T. Tiihonen. Free surfaces: shape sensitivity analysis and numerical methods. *Intnl. J. Num. Meth. Eng.*, 44:1079–1098, 1999.
14. T. Tiihonen. Shape calculus and finite element method in smooth domains. *Math. Comp.*, 70:1–15, 2001.
15. M. Laitinen and T. Tiihonen. Conductive-radiative heat transfer in grey materials. *Quart. Appl. Math.*, 59:737–768, 2001.
16. R. Melnik, P. Neittaanmäki, and T. Tiihonen. Coupled electromechanical effects in wurtzite quantum dots with wetting layers in gate controlled electric fields: The multiband case. *Physica E: Low-dimensional Systems and Nanostructures*, 46:97–104, 2012.
17. S. Prabhakar, R. Melnik, P. Neittaanmäki, and T. Tiihonen. Coupled magneto-thermoelectromechanical effects and electronic properties of quantum dots. *Journal of Computational and Theoretical Nanoscience*, 10:534–547, 2013.
18. C. Bartneck, T. Höylä, and T. Tiihonen. The consequences of competition: simulating the effects of research grant allocation strategies. *Scientometrics*, 108:263–288, 2016.
19. Shuai Shao, Sha Deng, Qingyun Jiang, Hangyu Zhang, Zhengyao Zhang, Na Li, Fengyu Cong, T. Tiihonen, and Bo Liu. A dna-encoded fret biosensor for visualizing the tension across paxillin in living cells upon shear stress. *Analysis & Sensing*, 2:e202100033, 2022.

20. G. Zhang, X. Li, Y. Lu, T. Tiihonen, Z. Chang, and C. Fengyu. Single-trial-based temporal principal component analysis on extracting event-related potentials of interest for an individual subject. *Journal of Neuroscience Methods*, 385:109768, 2023.
21. V. Terziyan and T. Tiihonen. Using cloning-gan architecture to unlock the secrets of smart manufacturing: Replication of cognitive models. *Procedia Computer Science*, 232:890–902, 2024.
22. A. K. Shukla, V. Terziyan, and T. Tiihonen. Ai as a user of ai: Towards responsible autonomy. *Heliyon*, 10, 2024.
23. Vagan Terziyan and Timo Tiihonen. Digital cloning as a self-adaptive multicriteria optimization process. In Vittorio Solina, Francesco Longo, and David Romero, editors, *6th International Conference on Industry 4.0 and Smart Manufacturing*, volume 253, pages 37–48, 2025.

B Non refereed articles

1. P. Neittanmäki and T. Tiihonen. Mathematical programming methods for an optimal shape design problem. *Z. Angew. Math. Mech.*, 64:339–340, 1984.
2. P. Neittanmäki and T. Tiihonen. Sensitivity analysis for a class of control problems. *Z. Angew. Math. Mech.*, 65:317–319, 1985.
3. J. Haslinger, P. Neittanmäki, and T. Tiihonen. On optimal shape design of elastic body on rigid foundation. In J. Whiteman, editor, *MAFELAP-84*, pages 555–562. Academic Press, London, 1985.
4. P. Neittanmäki and T. Tiihonen. Sensitivity analysis for some control problems. In *Numerical methods and applications'84*, pages 451–458. Bulgarian academy of sciences, Sofia, 1985.
5. T. Tiihonen. Some remarks on solving contact problems in elasticity. In P. Neittaanmäki, editor, *in Proceedings of the Summer School in Numerical Analysis at Jyväskylä*, volume 31, pages 309–317. Ber. Univ. Jyväskylä Math. Instit., 1985.
6. J. Haslinger, P. Neittanmäki, and T. Tiihonen. Shape optimization in contact problems. 1. Design of an elastic body. 2. Design of an elastic perfectly plastic body. In *Proceedings of 7th Intern. Conf. on Analysis and Optimization of Systems, LN in Control and Information Sciences 83*, pages 29–39. Springer Verlag, 1986.
7. T. Tiihonen and J.-P. Zolésio. Gradient with respect to nodes for non-isoparametric finite elements. In *Boundary Control and Boundary Variations, LN in Control and Information Sciences 100*, pages 311–316. Springer Verlag, 1988.
8. D. Tiba, R. Mäkinen, P. Neittanmäki, and T. Tiihonen. A boundary control approach to an optimal shape design problem. In A. El Jai and M. Amouroux, editors, *Proceedings of 5th IFAC symposium on control of distributed parameter systems*, pages 415–418. Pergamon, 1989.
9. J. Järvinen, R. Nieminen, and T. Tiihonen. Numerical simulation of the Czochralski crystal growth process. In *Proceedings of the 15th Nordic Semiconductor Meeting*. 1992.
10. T. Tiihonen and J. Järvinen. On fixed point (trial) methods for free boundary problems. In N. H. Antontsev, K. H. Hoffmann, and A. M. Kludhnev, editors, *Free boundary problems in continuum mechanics*, pages 339–350. Birkhäuser Verlag, Basel, 1992.
11. J. Hämäläinen and T. Tiihonen. Flow simulation with homogenized outflow boundary conditions. In *Proceedings of VIII Int. Conf. on Finite Elements on Fluids, Barcelona*, pages 537–545. Pineridge Press, 1993.
12. T. Tiihonen. On the approximation of some optimal shape design problems. In P. Neittanmäki and V. Rivkind, editors, *Jyväskylä-St. Petersburg seminar on partial differential equations and numerical methods*, volume 56, pages 125–131. Ber. Univ. Jyväskylä Math. Inst., 1993.
13. T. Tiihonen and R. B. Gonzalez de Paz. On a relaxation based numerical method for domain optimization. In P. Neittaanmäki, editor, *Proceedings of the workshop on optimization and optimal control*, volume 58, pages 167–182. Ber. Univ. Jyväskylä Math. Inst., 1993.
14. T. Tiihonen. Domain decomposition and non local boundary conditions. In P. Neittaanmäki, editor, *Industrial mathematics, Selected lectures presented in Finnish Mathematicians Days 11-12.1.93, Reports on Applied Mathematics and computing, Univ. of Jyväskylä, Dept. of Math. 1*, pages 62–71. 1993.
15. T. Tiihonen. Stefan-Boltzmann radiation for non convex surfaces. In R. Mäkinen and P. Neittaanmäki, editors, *Proceedings of the 5:th Finnish Mechanics Days*, pages 407–413. Report 3/94, Laboratory of Scientific Computing, University of Jyväskylä, 1994.
16. A. Eljendy and T. Tiihonen. On exact controllability of the wave equation with a lower order term. In J.-P. Zolésio, editor, *Boundary control and variation*, pages 189–203. Marcel Dekker, New York, 1994.

17. T. Tiihonen and R. B. Gonzalez de Paz. Relaxation method in shape optimization. In M. Krizek, P. Neittanmäki, and R. Stenberg, editors, *Finite Element Methods*, pages 443–450. Marcel Dekker, New York, 1994.
18. R. Pietikäinen and T. Tiihonen. Modelling of coupled heat and mass transfer in copying paper. In E. Kreuzer and O. Mahrenholtz, editors, *ZAMM, Special issue 4: Applied Sciences, especially Mechanics (Minisymposia)*, pages 74–76. Akademia Verlag, 1996.
19. J. Hämäläinen and T. Tiihonen. Modelling and simulation of fluid flows in a paper machine headbox. In E. Kreuzer and O. Mahrenholtz, editors, *ZAMM, Special issue 4: Applied Sciences, especially Mechanics (Minisymposia)*, pages 62–66. Akademia Verlag, 1996.
20. J. Järvinen, R. Nieminen, and T. Tiihonen. Mathematical modelling and numerical simulation of melt flow in Czochralski crystal growth. In Desideri, Le Tallec, Onate, Periaux, and Stein, editors, *Numerical Methods in Engineering'96*, pages 719–724. John Wiley, Chichester, 1996.
21. T. Tiihonen. Stefan problem with non-local radiation condition. In M. Niezgodka and P. Strzelecki, editors, *Free Boundary Problems, Theory and Applications*, pages 52–58. Addison Wesley, Harlow, 1996.
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23. K. Kärkkäinen and T. Tiihonen. Trial methods for nonlinear Bernoulli problem. In M. Brons, M. P. Bendsoe, and M. P. Sorensen, editors, *Progress in industrial mathematics at ECMI 96 (Lyngby, 1996)*, European Consort. Math. Indust., pages 260–267. Teubner, Stuttgart, 1997.
24. T. Tiihonen. Shape calculus and Babuska's paradox. In J. Aalto and T. Salmi, editors, *Proceedings of the 6:th Finnish Mechanics Days*, volume 56, pages 311–320. University of Oulu, 1997.
25. T. Tiihonen. Shape calculus and FEM in smooth domains. In M. Krizek, P. Neittanmäki, and R. Stenberg, editors, *Finite Element Methods: Superconvergence, Post-processing and A Posteriori Estimates*, pages 259–267. Marcel Dekker, New York, 1998.
26. K. Kärkkäinen and T. Tiihonen. Shape calculus and free boundary problems. In *European Congress on Computational Methods in Applied Sciences and Engineering, ECCOMAS 2004*. University of Jyväskylä, Department of Mathematical Information Technology, Jyväskylä, 2004.
27. T. Tiihonen, R. Piche, G. Gripenberg, and T. Leppänen. Drainage of pulp suspension. In R. Piche and M. Lyly, editors, *Proceedings of the 50th European Study Group with Industry*, pages 23–32. CSC oy, Espoo, 2004.
28. O. Kaikova, V. Terziyan, T. Tiihonen, M. Golovianko, S. Gryshko, and L. Titova. Hybrid threats against industry 4.0: adversarial training of resilience. In *E3S Web of Conferences*. EDP Sciences, 2022.

C Monographs

1. T. Tiihonen, editor. *Proceedings of the ninth ECMI Modelling Week*, Report 6/97. Laboratory of Scientific Computing, University of Jyväskylä, 1997.
2. P. Neittaanmäki, P. Tarvainen, and T. Tiihonen, editors. *Proceedings of the third European Conference on Numerical Mathematics and Advanced Applications, ENUMATH99*, Singapore, 2000. World Scientific.
3. S. Repin, T. Tiihonen, and T. Tuovinen, editors. *Numerical Methods for Differential Equations, Optimization, and Technological Problems*, volume 27 of *Computational Methods in Applied Sciences*, Heidelberg, 2013. Springer.
4. S. Gryshko, T. Dobko, O. Kaikova, V. Terziyan, T. Tiihonen, T. Radivilova, G. Kozopolianska, T. Fedirchyk, V. Zhukovski, N. Rodnenkova, Y. Korduba, and O. Kopievska, editors. *"We Share Because We Care": Reloading the Processes of Quality Assurance*, L'viv, 2014. Publisher Company Manuscript.
5. T. Dobko, M. Golovianko, O. Kaikova, V. Terziyan, T. Tiihonen, S. Gryshko, T. Radivilova, E. Malyshkina, O. Tsetshova, K. Malyshkina, M. Ivanchuk, G. Voskoboinykova, G. Kozopolianska, T. Fedirchyk, G. Tsepel, V. Zhukovsky, O. Kopievska, M. Golovinko, A. Chupryna, and Yu. Korduba, editors. *Quality matters: how to value and evaluate higher education*, L'viv, 2014. Publisher Company Manuscript.

D Professional and teaching material

1. P. Kuhno, P. Neittanmäki, and T. Tiihonen. Sorvipöllin keskittämismenetelmien vertailu tietokonesimulointia käyttäen (Comparison of bolt centering methods using computer simulation). *Paperi ja Puu*, 10, 1983.

2. V. Lappalainen, P. Neittanmäki, and T. Tiihonen. Rinnakkaislaskenta osittaisdifferentiaaliyhtälöiden numeerisessa ratkaisemisessa (Parallel computing in numerical solution of partial differential equations). *Arkhimedes*, 36:73–84, 1984.
3. T. Tiihonen. Matemaattinen mallittaminen (mathematical modelling, in finnish). Technical report, Univ. of Jyväskylä , Dept. of Mathematics, Lecture notes 16, 1991.
4. T. Tiihonen. Dimensioanalyysi. In S. Pohjolainen, editor, *Matemaattinen mallinnus*, pages 147–156. WSOYPro, 2010.
5. T. Tiihonen. Kontinuumimallit. In S. Pohjolainen, editor, *Matemaattinen mallinnus*, pages 188–210. WSOYPro, 2010.
6. T. Tiihonen. Yksinkertaisemmat mallit. In S. Pohjolainen, editor, *Matemaattinen mallinnus*, pages 223–237. WSOYPro, 2010.
7. T. Tiihonen. Dimensional analysis. In S. Pohjolainen, editor, *Mathematical Modelling*, pages 113–121. Springer, 2016.
8. T. Tiihonen. Continuum models. In S. Pohjolainen, editor, *Mathematical Modelling*, pages 149–170. Springer, 2016.
9. T. Tiihonen. Simplification of models. In S. Pohjolainen, editor, *Mathematical Modelling*, pages 171–183. Springer, 2016.

E For general public

1. P. Neittaanmäki, R. Neittaanmäki, and T. Tiihonen. *Yliopistojen tutkintokoulutuksen ja tutkimuksen rahoitus ja tulokset vuosina 2000-2004*. University of Jyväskylä, Finnish Institute of Educational Research, 2005.
2. P. Neittaanmäki, R. Neittaanmäki, T. Tiihonen, and J. Ärje. *Yliopistojen tutkintokoulutuksen ja tutkimuksen rahoitus ja tulokset vuosina 2000-2004 ja 2005-2009*. University of Jyväskylä, Finnish Institute of Educational Research, 2010.
3. T. Tiihonen. Sovelletusta matematiikasta kuoriutui tietotekniikan laitos. In M. Heikkilä, editor, *Sattumaa, haperotatteja ja keltainen syklotroni*, pages 19–24. Jyväskylän yliopisto, Jyväskylä, 2015.
4. T. Tiihonen. Professori Osmo Pekonen, 1960-2022. *Arkhimedes (3)*, 2022.

F Works of Art

G Theses

1. T. Tiihonen. *Shape optimization and unilateral boundary value problems*. PhD thesis, University of Jyväskylä, Department of Mathematics, 1987.