

This is a list of applications of CMA-ES on various kinds of problems. The list is rather incomplete, in particular for references after 2007. To include a reference please send a bibtex-entry and the pdf of the article to hansen AT Iri.fr.

References to CMA-ES Applications

- [1] N. Hansen, S.P.N. Niederberger, L. Guzzella, and P. Koumoutsakos. A method for handling uncertainty in evolutionary optimization with an application to feedback control of combustion. *IEEE Transactions on Evolutionary Computation*, 13(1):180–197, 2009.
- [2] O. Ibáñez, L. Ballerini, O. Cordón, S. Damas, and J. Santamaría. An experimental study on the applicability of evolutionary algorithms to craniofacial superimposition in forensic identification. *Information Sciences*, 179:3998–4028, 2009.
- [3] A. Abudhahir and S. Baskar. An evolutionary optimized nonlinear function to improve the linearity of transducer characteristics. *Meas. Sci. Technol.*, 19:045103 (11pp), 2008.
- [4] A. Abudhahir and S. Baskar. Evolutionary optimised nonlinear function for linearisation of constant temperature anemometer. *IET Sci. Meas. Technol.*, 2(4):208–218, 2008.
- [5] N. Bredeche. A Multi-Cellular Developmental System in Continuous Space using Cell Migration. In M. Asada et al., editor, *Simulation of Adaptive Behavior*, volume 5040 of *Lecture Notes in Computer Science*, pages 260–269, Osaka Japon, 2008.
- [6] F. Jiang, H. Berry, and M. Schoenauer. Unsupervised Learning of Echo State Networks: Balancing the Double Pole. In C. Ryan et al., editor, *Genetic and Evolutionary Computation Conference (GECCO)*, 2008.
- [7] F. Jiang, H. Berry, and M. Schoenauer. Supervised and Evolutionary Learning of Echo State Networks. In G. Rudolph et al., editor, *Parallel Problem Solving from Nature (PPSN'08)*, Lecture Notes in Computer Science, 2008.
- [8] K. Fukagata, S. Kern, P. Chatelain, P. Koumoutsakos, and N. Kasagi. Evolutionary optimization of an anisotropic compliant surface for turbulent friction drag reduction. *J. Turbulence*, 9(35):1–17, 2008.
- [9] Christian Gagné, Julie Beaulieu, Marc Parizeau, and Simon Thibault. Human-competitive lens system design with evolution strategies. *Appl. Soft Comput.*, 8(4):1439–1452, 2008.
- [10] R. H. Gong and P. Abolmaesumi. 2D/3D registration with the CMA-ES method. In *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, volume 6918 of *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, April 2008.
- [11] N. Hansen, A.S.P. Niederberger, L. Guzzella, and P. Koumoutsakos. Evolutionary optimization of feedback controllers for thermoacoustic instabilities. In Jonathan F. Morrison, D. M. Birch, and P. Lavoie, editors, *IUTAM Symposium on Flow Control and MEMS, Proceedings held at the Royal Geographical Society, 19-22 September 2006*, volume 7 of *IUTAM Bookseries*. Springer, 2008.
- [12] Nils T. Siebel, Gerald Sommer, and Yohannes Kassahun. Evolutionary learning of neural structures for visuo-motor control. In Arpad Kelemen, Ajith Abraham, and Yulan Liang, editors, *Computational Intelligence in Medical Informatics*, Studies in Computational Intelligence, chapter 5, pages 93–115. Springer, Berlin, Germany, 2008.
- [13] J. W. Wilson, P. Schlup, M. Lunacek, D. Whitley, and R. A. Bartels. Calibration of liquid crystal ultrafast pulse shaper with common-path spectral interferometry and application to coherent control with a covariance matrix adaptation evolutionary strategy. *Review of Scientific Instruments*, 79(3):033103, March 2008.
- [14] S. Winter, B. Brendel, I. Pechlivanis, K. Schmieder, and C. Igel. Registration of CT and intraoperative 3D ultrasound images of the spine using evolutionary and gradient-based methods. *IEEE Transactions on Evolutionary Computation*, 2008.
- [15] P. Bayer, C. M. Bürger, and M. Finkel. Computationally efficient stochastic optimization using multiple realizations. *Advances in Water Resources*, 2007.

- [16] P. Bayer, C.M. Bürger, and M. Finkel. Solving demanding reliability based design problems in hydrogeology. In *Pre-published Proceedings 6th Int. Conf. on Calibration and Reliability in Groundwater Modeling - Credibility in Modeling, ModelCARE2007*, pages 28–33, Copenhagen Denmark, September 2007.
- [17] P. Bayer and M. Finkel. Optimization of concentration control by evolution strategies: Formulation, application, and assessment of remedial solutions. *Water Resources Research*, 43(2), 2007.
- [18] C.M. Bürger, P. Bayer, and M. Finkel. Algorithmic funnel-and-gate system design optimization. *Water Resources Research*, 43(8), 2007.
- [19] M.V. Chitturi, A. Manik, and K. Gopalakrishnan. Digital filters for Hot-Mix Asphalt Complex Modulus Test Data Using Genetic Algorithm Strategies. *International Journal of Computational Intelligence*, 4(1), 2007.
- [20] C. Dekomien, M. Mildenstein, K. Hensel, S. Hold, and S. Winter. Registration of Intraoperative 3D Ultrasound with MR Data for the Navigated Computer Based Surgery. *Springer Proceedings in Physics*, 114:252, 2007.
- [21] A. Devert, N. Bredeche, and M. Schoenauer. Unsupervised learning of echo state networks: A case study in artificial embryogeny. In *Proceedings of the 8th International Conference on Artificial Evolution*, Tours, France, 2007. <http://hal.inria.fr/inria-00174593/en/>.
- [22] T. Hohm and E. Zitzler. Modeling the Shoot Apical Meristem in *A. thaliana*: Parameter Estimation for Spatial Pattern Formation. In Elena Marchiori, Jason H. Moore, and Jagath C. Rajapakse, editors, *Evolutionary Computation, Machine Learning and Data Mining in Bioinformatics*, volume 4447 of LNCS, pages 102–113. Springer, 2007.
- [23] T. Hohm and E. Zitzler. Multicellular Pattern Formation: Parameter Estimation for ODE-based Gene Regulatory Network Models. *IEEE Eng Med Biol*, 2007.
- [24] M. Jebalia, A. Auger, M. Schoenauer, F. James, and M. Postel. Identification of the Isotherm Function in Chromatography Using CMA-ES. In *Proceedings of the IEEE Congress On Evolutionary Computation*, 2007.
- [25] S. Kern, N. Hansen, and P. Koumoutsakos. Optimization of simulated fish swimming using efficient local quadratic meta-models and evolution strategies. In *Eurogen 2007*, Jyväskylä, Finland, June 2007.
- [26] S. Kern, P. Koumoutsakos, and K. Eschler. Optimization of anguilliform swimming. *Phys. of Fluids*, 19:091102–1, 2007.
- [27] I. Kouznetsova, P. Bayer, M. Ebert, and M. Finkel. Modelling the long-term performance of zero-valent iron using a spatio-temporal approach for iron aging. *Journal of Contaminant Hydrology*, 90(1-2):58–80, 2007.
- [28] C. Li and P.H. Heinemann. A comparative study of three evolutionary algorithms for surface acoustic wave sensor wavelength selection. *Sensors & Actuators: B. Chemical*, 125(1):311–320, 2007.
- [29] J. Mehnen, R. Roy, P. Kersting, and T. Wagner. ICSPEA: evolutionary five-axis milling path optimisation. In *Proceedings of the 9th annual conference on Genetic and evolutionary computation*, pages 2122–2128. ACM Press New York, NY, USA, 2007.
- [30] N.S. Mera. Passive gamma tomography reconstruction of layered structures in nuclear waste vaults. *Inverse Problems*, 23(1):385–403, 2007.
- [31] N.S. Mera. Evolutionary optimization for passive gamma tomography reconstruction of circular inclusions in nuclear waste vaults. *International Journal for Numerical Methods in Engineering*, page in press, 2007.
- [32] J. Schaub, K. Mauch, and M. Reuss. Metabolic flux analysis in *escherichia coli* by integrating isotopic dynamic and isotopic stationary ¹³c labeling data. *Biotechnology and Bioengineering*, 99(5):1170–1185, 2007.
- [33] O.M. Shir, J.N. Kok, T. Back, and M.J.J. Vrakking. Gaining Insights into Laser Pulse Shaping by Evolution Strategies. *Lecture Notes in Computer Science*, 4527:467, 2007.
- [34] O.M. Shir and T. Bäck. The second harmonic generation case-study as a gateway for ES to quantum control problems. *Proceedings of the 9th annual conference on Genetic and evolutionary computation*, pages 713–721, 2007.
- [35] N.T. Siebel, J. Krause, and G. Sommer. Efficient Learning of Neural Networks with Evolutionary Algorithms. *Lecture Notes in Computer Science*, 4713:466, 2007.

- [36] S. Baskar, P.N. Suganthan, N.Q. Ngo, A. Alphones, and R.T. Zheng. Design of triangular FBG filter for sensor applications using covariance matrix adapted evolution algorithm. *Optics Communications*, 260(2):716–722, 2006.
- [37] D. Charypar, K.W. Axhausen, and K. Nagel. Implementing activity-based models: Accelerating the replanning process of agents using an evolution strategy. In *Conference On Issues In Behavioral Demand Modeling And The Evaluation Of Travel Time*, 2006.
- [38] S. Kern and P. Koumoutsakos. Simulations of optimized anguilliform swimming. *Journal of Experimental Biology*, 209(24):4841–4857, 2006.
- [39] Yohannes Kassahun. *Towards a unified approach to learning and adaptation*. PhD thesis, University of Bremen, 2006.
- [40] P Koumoutsakos and Muller SD. Flow optimization using stochastic algorithms. In *Lecture notes in control and information sciences*, volume 330, pages 213–229. Springer, 2006.
- [41] C. Li, P. Heinemann, and P. Reed. Evolutionary strategy (ES) to optimize electronic nose sensor selection. In *Computers in Agriculture and Natural Resources, 4th World Congress Conference, Proceedings*. American Society of Agricultural and Biological Engineers, 2006.
- [42] C. Li, P. Heinemann, and P. Reed. Genetic algorithms (GAs) and CMA evolutionary strategy to optimize electronic nose sensor selection. In *2006 ASAE Annual Meeting*. American Society of Agricultural and Biological Engineers, 2006.
- [43] Stefan Menzel, Markus Olhofer, and Bernhard Sendhoff. Direct manipulation of free form deformation in evolutionary design optimisation. In T. Runarsson and others, editor, *Parallel Problem Solving from Nature – PPSN IX, proceedings, LNCS-4193*, pages 352–361. Springer, 2006.
- [44] B. Mersch, T. Glasmachers, P. Meinicke, and C. Igel. Evolutionary Optimization of Sequence Kernels for Detection of Bacterial Gene Starts. *Proc. Intl Conf. Artificial Neural Networks (ICANN06)*, 2006.
- [45] O.M. Shir, C. Siedschlag, T. Bäck, and M.J.J. Vrakking. The complete-basis-functions parameterization in ES and its application to laser pulse shaping. *Proceedings of the 8th annual conference on Genetic and evolutionary computation*, pages 1769–1776, 2006.
- [46] O.M. Shir, C. Siedschlag, T. Back, and M.J.J. Vrakking. Evolutionary Algorithms in the Optimization of Dynamic Molecular Alignment. In *Proceedings of the IEEE Congress on Evolutionary Computation*, 2006.
- [47] O.M. Shir, C. Siedschlag, T. Back, and M.J. Vrakking. Niching in evolution strategies and its application to laser pulse shaping. *Lecture Notes in Computer Science*, 3871:85–96, 2006.
- [48] Nils T Siebel and Yohannes Kassahun. Learning neural networks for visual servoing using evolutionary methods. In *Proceedings of the 6th International Conference on Hybrid Intelligent Systems (HIS'06), Auckland, New Zealand*, page 6, December 2006.
- [49] C. Siedschlag, OM Shir, T. Bäck, and M.J.J. Vrakking. Evolutionary algorithms in the optimization of dynamic molecular alignment. *Optics Communications*, 264(2):511–518, 2006.
- [50] C. Spieth, R. Worzischek, and F. Streichert. Comparing evolutionary algorithms on the problem of network inference. *Proceedings of the 8th annual conference on Genetic and evolutionary computation*, pages 305–306, 2006.
- [51] A.M. Sutton, D. Whitley, M. Lunacek, and A. Howe. PSO and multi-funnel landscapes: how cooperation might limit exploration. *Proceedings of the 8th annual conference on Genetic and evolutionary computation*, pages 75–82, 2006.
- [52] Y. Kassahun and G. Sommer. Efficient reinforcement learning through evolutionary acquisition of neural topologies. In M. Verleysen, editor, *13th European Symposium on Artificial Neural Networks, Bruges, Belgium*, pages 259–266. d-side, 2005.
- [53] S. Baskar, A. Alphones, P.N. Suganthan, N.Q. Ngo, and R.T. Zheng. Design of optimal length low-dispersion FBG filter using covariance matrix adapted evolution. *Photonics Technology Letters, IEEE*, 17(10):2119–2121, 2005.

- [54] D. Buche, NN Schraudolph, and P. Koumoutsakos. Accelerating evolutionary algorithms with Gaussian process fitness function models. *Systems, Man and Cybernetics, Part C, IEEE Transactions on*, 35(2):183–194, 2005.
- [55] K. Bush, J. Knight, and C. Anderson. Optimizing conductance parameters of cortical neural models via electrotonic partitions. *Neural Netw*, 18(5-6):488–96, 2005.
- [56] P. Cerveri, N. Lopomo, A. Pedotti, and G. Ferrigno. Derivation of centers and axes of rotation for wrist and fingers in a hand kinematic model: robust methods and reliability results. *Annals of Biomedical Engineering*, 33(3):402–412, 2005.
- [57] L. Damp and L.F. Gonzalez. Optimisation of the nose of a hypersonic vehicle using dsmc simulation and evolutionary optimisation. In *5th AIAA ASSC Space Conference, Melbourne, Australia, 14-16 September, 2005*.
- [58] F. Friedrichs and C. Igel. Evolutionary tuning of multiple SVM parameters. *Neurocomputing*, 64:107–117, 2005.
- [59] M. Hasenjäger, B. Sendhoff, T. Sonoda, and T. Arima. Three dimensional evolutionary aerodynamic design optimization with CMA-ES. In *Proceedings of the 2005 conference on Genetic and evolutionary computation*, pages 2173–2180. ACM Press New York, NY, USA, 2005.
- [60] M Husken, Y Jin, and B Sendhoff. Structure optimization of neural networks for evolutionary design optimization. *Soft Computing*, 9(1):21–28, 2005.
- [61] S. Menzel, M. Olhofer, and B. Sendhoff. Application of Free Form Deformation Techniques in Evolutionary Design Optimisation. In *6th World Congress on Structural and Multidisciplinary Optimization, Rio de Janeiro, 2005*.
- [62] N. G. Pavlidis, K. E. Parsopoulos, and M. N. Vrahatis. Computing nash equilibria through computational intelligence methods. *Journal of Computational and Applied Mathematics*, 175(1):113–136, 2005.
- [63] Antonio Pellecchia, Christian Igel, Johann Edelbrunner, and Gregor Schöner. Making driver modeling attractive. *IEEE Intelligent Systems*, 20(2):8–12, 2005.
- [64] R Quast, R Baade, and D Reimers. Evolution strategies applied to the problem of line profile decomposition in qso spectra. *Astronomy & Astrophysics*, 431(3):1167–1175, 2005.
- [65] J.E. Shepherd, D.L. McDowell, and K.I. Jacob. Modeling morphology evolution and mechanical behavior during thermo-mechanical processing of semi-crystalline polymers. *Journal of the mechanics and physics of solids*, 54(3):467–489, 2006.
- [66] S. Thibault, C. Gagné, J. Beaulieu, and M. Parizeau. Evolutionary algorithms applied to lens design: Case study and analysis. In *Proc. of the SPIE International Symposium on Optical Systems Design (EOD 2005)*, Jena, Germany, 2005.
- [67] M. Warth. *Comparative Investigation of Mathematical Methods for Modeling and Optimization of Common-Rail DI Diesel Engines*. PhD thesis, ETH Zurich, 2005.
- [68] Susanne Winter, Bernhard Brendel, and Christian Igel. Registrierung von knochen in 3d-ultraschall- und ct-daten: Vergleich verschiedener optimierungsverfahren. In *In Bildverarbeitung für die Medizin (BVM)*, pages 345–149. Springer, 2005.
- [69] Susanne Winter, Bernhard Brendel, and Christian Igel. Registration of bone structures in 3d ultrasound and ct data: Comparison of different optimization strategies. In H. U. Lemke, K. Inamura, K. Doi, M. W. Vannier, and Farman A. G., editors, *Computer Assisted Radiology and Surgery (CARS 2005), International Congress Series 1281*, pages 242–247. Elsevier, 2005.
- [70] Peter Bayer. *Modelling, economic assessment and optimisation of in-situ groundwater remediation systems*. PhD thesis, Universität Tübingen, 2004.
- [71] Peter Bayer and Michael Finkel. Evolutionary algorithms for the optimization of advective control of contaminated aquifer zones. *Water Resources Research*, 40(6):–, 2004. W06506.
- [72] P. Cerveri, A. Pedotti, and G. Ferrigno. Evolutionary optimization for robust hierarchical computation of the rotation centres of kinematical chains from reduced ranges of motion: the lower spine case. *Journal of Biomechanics*, 37(12):1881–1890, 2004.
- [73] P Cerveri, A Pedotti, and G Ferrigno. Non-invasive approach towards the in vivo estimation of 3d inter-vertebral movements: methods and preliminary results. *Medical Engineering & Physics*, 26(10):841–853, 2004.

- [74] Frauke Friedrichs and Christian Igel. Evolutionary tuning of multiple SVM parameters. In *12th European Symposium on Artificial Neural Networks (ESANN)*, 2004.
- [75] A.L. Marsden, M. Wang, J.E. Dennis, and P. Moin. Optimal Aeroacoustic Shape Design Using the Surrogate Management Framework. *Optimization and Engineering*, 5(2):235–262, 2004.
- [76] S. D. Müller, I. Mezic, J. H. Walther, and P. Koumoutsakos. Transverse momentum micromixer optimization with evolution strategies. *Computers and Fluids*, 33(4):521–531, 2004.
- [77] Yuichi Nagata. The lens design using the cma-es algorithm. In Kalyanmoy Deb, editor, *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO 2004)*, pages 1189–1200. Springer, 2004.
- [78] R. Quast, D. Reimers, and S.A. Levshakov. Probing the variability of the fine-structure constant with the VLT/UVES. *Astron. Astrophys.*, 415., 415(2):L7–L11, 2004.
- [79] Stefan Schneider, Christian Igel, Christian Klaes, Hubert R. Dinse, and Jan C. Wiemer. Evolutionary adaption of nonlinear dynamical systems in computational neuroscience. *Genetic Programming and Evolvable Machines*, 5(2):215–227, 2004.
- [80] T. Sonoda, Y. Yamaguchi, T. Arima, M. Olhofer, B. Sendhoff, and H.A. Schreiber. Advanced High Turning Compressor Airfoils for Low Reynolds Number Condition, Part I: Design and Optimization. *Journal of Turbomachinery*, 126:350–359, 2004.
- [81] M. Villasana and G. Ochoa. Heuristic design of cancer chemotherapies. *IEEE Transactions on Evolutionary Computation*, 8(6):513–521, 2004.
- [82] P. Bayer and M. Finkel. Capture zone adaption using evolutionary algorithms. In E. Poeter, C. Zheng, M. Hill, J. Dougherty, and S. Seo, editors, *MODFLOW and More 2003: Understanding through Modeling*, pages 759–763. IGWMC Publ, 2003.
- [83] Dirk Büche. *Multi-Objective Evolutionary Optimization of Gas Turbines*. PhD thesis, Institute of Computational Science, ETH Zürich, 2003. Diss. ETH No.
- [84] Dirk Büche, Nicol N. Schraudolph, and Petros Koumoutsakos. Accelerating evolutionary algorithms using fitness function models. In *Workshop On Learning, Adaptation, and Approximation in Evolutionary Computation, GECCO 2003*, 2003.
- [85] D. Büche, G. Guidati, and P. Stoll. Automated design optimization of compressor blades for stationary, large-scale turbomachinery. In *Proceedings of the ASME/IGTI Turbo Expo 2003*, 2003.
- [86] Thomas Bücher, Cristobal Curio, Hannes Edelbrunner, Christian Igel, David Kastrup, Iris Leefken Gesa Lorenz, Axel Steinhage, and Werner von Seelen. Image processing and behaviour planning for intelligent vehicles. *IEEE Transactions on Industrial Electronics*, 50(1):62–75, 2003.
- [87] Carlo Guardiani. *An adaptive evolution strategy for protein folding*. PhD thesis, Università degli studi di firenze, 2003.
- [88] Christian Igel. Neuroevolution for reinforcement learning using evolution strategies. In R. Sarker, R. Reynolds, H. Abbass, K. C. Tan, B. McKay, D. Essam, and T. Gedeon, editors, *Congress on Evolutionary Computation 2003 (CEC 2003)*, volume 4, pages 2588–2595. IEEE Press, 2003.
- [89] P. Koumoutsakos, S.D. Müller, D. Büche, and M. Milano. Stochastic optimization for fluid dynamic applications. In G. Bugeđa, J.-A. Desideri, J. Periaux, M. Schoenauer, and G. Winter, editors, *Evolutionary Methods for Design, Optimization and Control: Applications to Industrial and Societal Problems – Proceedings of the EUROGEN 2003 Conference, Barcelona, Spain, Sep 15-17 2003*, page 3, 2003.
- [90] I. Kouznetsova, P. Bayer, S. Birk, R. Liedl, and M. Finkel. Numerical modelling of the sequenced use of zero valent iron and activated carbon for in-situ groundwater remediation. In *Proc. of 8th International FZK/TNO Conference on Contaminated Soil (CONSOIL), Gent, Belgium*, pages 932–941, May 2003.
- [91] C.G. Moles, P. Mendes, and J.R. Banga. Parameter Estimation in Biochemical Pathways: A Comparison of Global Optimization Methods. *Genome Research*, 13:2467–2474, 2003.
- [92] S. D. Müller, N. N. Schraudolph, and P. Koumoutsakos. Evolutionary and gradient-based algorithms for lennard-jones cluster optimization. In Alwyn Barry, editor, *Workshop on Learning, Adaptation, and Approximation in Evolutionary Computation, Proceedings of the Genetic and Evolutionary Computation Conference (GECCO)*, 2003.

- [93] Hubert R. Dinse, Michael Hüsken, Christian Igel, Christian Klaes, Marc Nunkesser, Stefan Schneider, and Jan Wiemer. Derandomized evolution strategies in computational neuroscience. In Wolfgang Banzhaf and James A. Foster, editors, *Biological Applications of Genetic and Evolutionary Computation (BioGEC 2002) – A Bird-of-a-feather Workshop at the Genetic and Evolutionary Computation Conference (GECCO 2002)*, 2002.
- [94] S. Hirche, I. Santibanez Koref, and I. Boblan. Design of strong causal fitness functions. In Abraham A., Ruiz-Del-Solar J., and Köppen M., editors, *Soft Computing Systems*, pages 183–192. IOS Press, Amsterdam, 2002.
- [95] Christian Igel. *Beiträge zum Entwurf neuronaler Systeme*. PhD thesis, University of Bielefeld, Faculty of Technology, 2002. ISBN: 3-8322-1103-9.
- [96] Christian Igel, Werner von Seelen, Wolfram Erlhagen, and Dirk Jancke. Evolving field models for inhibition effects in early vision. *Neurocomputing*, 44-46(C):467–472, 2002. Will also appear in J. M. Bower (Ed.): *Computational Neuroscience: Trends in Research 2001*, Elsevier Science. In Press.
- [97] S. Winter, B. Brendel, A. Rick, M. Stockheim, K. Schmieder, and H. Ermert. Registration of bone surfaces, extracted from CT-datasets, with 3D-ultrasound. *Biomed Tech (Berl)*, 47(1 Pt 1):57–60, 2002.
- [98] Sibylle D. Müller. *Bio-Inspired Optimization Algorithms for Engineering Applications*. PhD thesis, Institute of Computational Science, ETH Zürich, 2002. Diss. ETH No. 14719.
- [99] Sibylle D. Müller and Petros Koumoutsakos. Control of micromixers, jets, and turbine cooling using evolution strategies. In *International Centre for Mechanical Science (CISM), Udine, Italy*, 2002.
- [100] Sibylle D. Müller, Jarno Marchetto, Stefano Airaghi, and Petros Koumoutsakos. Optimization based on bacterial chemotaxis. *IEEE Trans. Evol. Comput.*, 6(1):16–29, 2002.
- [101] R. Quast, R. Baade, and D. Reimers. Fine-structure diagnostics of neutral carbon toward HE 0515-4414. *Astron. Astrophys.*, 386(3):796–800, 2002.
- [102] Thomas Bergener, Carsten Bruckhoff, and Christian Igel. Parameter optimization for visual obstacle detection using a derandomized evolution strategy. In Jacques Blanc-Talon and Dan Popesc, editors, *Imaging and Vision Systems: Theory, Assessment and Applications*, volume 9 of *Advances in Computation: Theory and Practice*, chapter 13, pages 265–279. NOVA Science Books, Huntington, NY 11743 (USA), 2001.
- [103] P. Cerveri, A. Pedotti, and N.A. Borghese. Combined evolution strategies for dynamic calibration of video-based measurement systems. *IEEE Transactions on Evolutionary Computation*, 5(3):271–282, June 2001.
- [104] H. Edelbrunner, U. Handmann, I. Igel, I. Leefken, and W. von Seelen. Application and optimization of neural field dynamics for driver assistance. In *The IEEE 4th International Conference on Intelligent Transportation Systems (ITSC '01)*, pages 309–314. Piscataway, NJ, 2001. IEEE Press.
- [105] Christian Igel, Wolfram Erlhagen, and Dirk Jancke. Optimization of neural field models. *Neurocomputing*, 36(1–4):225–233, 2001.
- [106] Christian Igel and Werner von Seelen. Design of a field model for early vision: A case study of evolutionary algorithms in neuroscience. In *28th Goettingen Neurobiology Conference*, 2001.
- [107] Sibylle D. Müller, Jens H. Walther, and Petros D. Koumoutsakos. Evolution strategies for film cooling optimization. *AIAA J.*, 39(3):537–539, 2001.
- [108] S. D. Müller, I. F. Sbalzarini, J. H. Walther, and P. D. Koumoutsakos. Evolution strategies for the optimization of microdevices. In *Proceedings of the Congress on Evolutionary Computation (CEC), Seoul, Korea*, pages 302–309, 2001.
- [109] Sibylle D. Müller and Petros Koumoutsakos. Mixing optimization with evolution strategies. In *Evolutionary Methods for Design, Optimisation and Control with Applications to Industrial Problems, Proceedings of EURO-GEN 2001 Conference*, pages 448–452, 2001.
- [110] M. Olhofer, Y. Jin, and B. Sendhoff. Adaptive encoding for aerodynamic shape optimization using Evolution Strategies. In *Proceedings of the Congress on Evolutionary Computation*, volume 1, pages 576–583, 2001.
- [111] Ivo F. Sbalzarini, Sibylle Müller, and Petros Koumoutsakos. Microchannel optimization using multiobjective evolution strategies. In Eckart Zitzler, Kalyanmoy Deb, Lothar Thiele, Carlos A. Coello Coello, and David Corne, editors, *Proceedings of the First International Conference on Evolutionary Multi-Criterion Optimization (EMO), Zürich, Switzerland*, pages 516–530. Springer Lecture Notes in Computer Science, 2001.

- [112] Ivo F. Sbalzarini, Sibylle D. Muller, Petros D. Koumoutsakos, and G.-H. Cottet. Evolution strategies for computational and experimental fluid dynamic applications. In Lee Spector, Erik D. Goodman, Annie Wu, W. B. Langdon, Hans-Michael Voigt, Mitsuo Gen, Sandip Sen, Marco Dorigo, Shahram Pezeshk, Max H. Garzon, and Edmund Burke, editors, *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO-2001)*, pages 1064–1071, San Francisco, California, USA, 7-11 2001. Morgan Kaufmann.
- [113] B. Naujoks, L. Willmes, W. Haase, Th. Bäck, and M. Schütz. Multi-point airfoil optimization using evolution strategies. In *ECCOMAS 2000, European Congress on Computational Methods in Applied Sciences and Engineering*, 2000.
- [114] Markus Olhofer, Toshiyuki Arima, Toyotaka Sonoda, and Bernhard Sendhoff. Optimisation of a stator blade used in a transonic compressor cascade with evolution strategies. In I.C. Parmee, editor, *Adaptive Computing in Design and Manufacture (ACDM)*, pages 45–54. Springer, 2000.
- [115] P. Koumoutsakos and P. Moin. Algorithms for shear flow control and optimization, decision and control. In *Proceedings of the 38th IEEE Conference*, volume 3, pages 2839–2844, 1999.
- [116] S. D. Müller, M. Milano, and P. Koumoutsakos. Application of machine learning algorithms to flow modeling and optimization. In *CTR Annual Research Briefs*, 1999.
- [117] Michael Alvers. *Zur Anwendung von Optimierungsstrategien auf Potentialfeldmodelle*. PhD thesis, Freie Universität Berlin, 1998.
- [118] Dirk Holste. Modellkalibrierung am Beispiel von Kläranlagenmodellen. In Sigrid Hafner, editor, *Industrielle Anwendungen Evolutionärer Algorithmen*, chapter 4, pages 37–44. Oldenbourg Verlag, München, 1998.
- [119] Thorsten Lutz and S. Wagner. Drag reduction and shape optimization of airship bodies. *Journal of Aircraft*, 35(3):345–351, 1998.
- [120] Thorsten Lutz and S. Wagner. Numerical shape optimization of natural laminar flow bodies. In *Proceedings of 21st ICAS Congress*, Melbourne, 1998.