# Practical Mathematical Optimization Basic Optimization Theory And Gradient Based Algorithms Springer Optimization And Its Applications 133 Band 133 By Jan A Snyman Daniel N Wilke

"Buchrückseite This textbook presents a wide range of tools for a course in mathematical optimization for upper undergraduate and graduate students in mathematics, engineering, computer science, and other applied sciences. Â Basic optimization principles are presented with emphasis on gradient-based numerical optimization strategies and algorithms for solving both smooth and noisy discontinuous optimization problems. Attention is also paid to the difficulties of expense of function evaluations and the existence of multiple minima that often unnecessarily inhibit the use of gradient-based methods. This second edition addresses further advancements ofÂ gradient-only optimization strategies to handleÂ discontinuities in objective functions. New chapters discuss the construction of surrogate modelsÂ as well as new gradient-only solution strategies andÂ numerical optimizationÂ using Python. A special Python module is electronically available (via springerlink) that makes the new algorithms featured in the text easily accessible and directly applicable. Numerical examples and exercises are included to encourage senior- to graduate-level students to plan, execute, and reflect on numerical investigations. By gaining a deep understanding of the conceptual material presented, students, scientists, and engineers will be Â able to develop systematic and scientific numerical investigative skills.Â  Äœber den Autor und weitere Mitwirkende **Jan A. Snyman** currently holds the position of emeritus professor in the Department of Mechanical and Aeronautical Engineering of the University of Pretoria, having retired as full professor in 2005. He has taught physics, mathematics and engineering mechanics to science and engineering students at undergraduate and postgraduate level, and has supervised the theses of 26 Masters and 8 PhD students. His research mainly concerns the development of gradient-based trajectory optimization algorithms for solving noisy and multi-modal problems, and their application in approximation methodologies for the optimal design of engineering systems. He has authored or co-authored 89 research articles in peer-reviewed journals as well as numerous papers in international conference proceedings. **Daniel N. Wilke** is a senior lecturer in the Department of Mechanical and Aeronautical Engineering of the University of Pretoria.Â  Â He teaches computer programming, mathematical programming and computational mechanics to science and engineering students at undergraduate and postgraduate level. His currentÂ research focuses on the development of interactiveÂ design optimization technologies, and enablingÂ statistical learning (artificial intelligence)Â application layers,Â for industrial processes and engineering design. 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