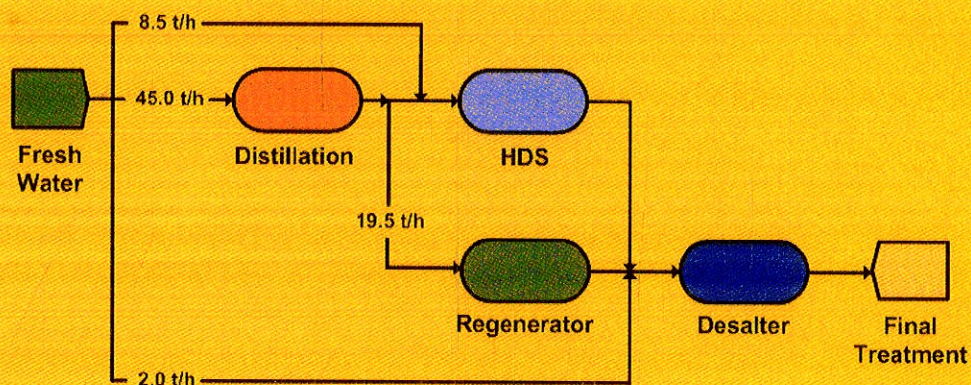


Advances in Process Systems Engineering – Vol. 2

# STOCHASTIC GLOBAL OPTIMIZATION

Techniques and Applications in  
Chemical Engineering



Gade Pandu Rangaiah

*editor*

# CONTENTS

<b>Preface</b>		v
<b>Chapter 1</b>	Introduction <i>Gade Pandu Rangaiah</i>	1
<b>Chapter 2</b>	Formulation and Illustration of Luus-Jaakola Optimization Procedure <i>Rein Luus</i>	17
<b>Chapter 3</b>	Adaptive Random Search and Simulated Annealing Optimizers: Algorithms and Application Issues <i>Jacek M. Jeżowski, Grzegorz Poplewski and Roman Bochenek</i>	57
<b>Chapter 4</b>	Genetic Algorithms in Process Engineering: Developments and Implementation Issues <i>Abdunnaser Younes, Ali Elkamel and Shawki Areibi</i>	111
<b>Chapter 5</b>	Tabu Search for Global Optimization of Problems Having Continuous Variables <i>Sim Mong Kai, Gade Pandu Rangaiah and Mekapati Srinivas</i>	147
<b>Chapter 6</b>	Differential Evolution: Method, Developments and Chemical Engineering Applications <i>Chen Shaoqiang, Gade Pandu Rangaiah and Mekapati Srinivas</i>	203

<b>Chapter 7</b>	Ant Colony Optimization: Details of Algorithms Suitable for Process Engineering <i>V. K. Jayaraman, P. S. Shelokar, P. Shingade, V. Pote, R. Baskar and B. D. Kulkarni</i>	237
<b>Chapter 8</b>	Particle Swarm Optimization for Solving NLP and MINLP in Chemical Engineering <i>Bassem Jarboui, Houda Derbel, Mansour Eddaly and Patrick Siarry</i>	271
<b>Chapter 9</b>	An Introduction to the Harmony Search Algorithm <i>Gordon Ingram and Tonghua Zhang</i>	301
<b>Chapter 10</b>	Meta-Heuristics: Evaluation and Reporting Techniques <i>Abdunnaser Younes, Ali Elkamel and Shawki Areibi</i>	337
<b>Chapter 11</b>	A Hybrid Approach for Constraint Handling in MINLP Optimization using Stochastic Algorithms <i>G. A. Durand, A. M. Blanco, M. C. Sanchez and J. A. Bandoni</i>	353
<b>Chapter 12</b>	Application of Luus-Jaakola Optimization Procedure to Model Reduction, Parameter Estimation and Optimal Control <i>Rein Luus</i>	375
<b>Chapter 13</b>	Phase Stability and Equilibrium Calculations in Reactive Systems using Differential Evolution and Tabu Search <i>Adrián Bonilla-Petriciolet, Gade Pandu Rangaiah, Juan Gabriel Segovia-Hernández and José Enrique Jaime-Leal</i>	413
<b>Chapter 14</b>	Differential Evolution with Tabu List for Global Optimization: Evaluation of Two Versions on Benchmark and Phase Stability Problems <i>Mekapati Srinivas and Gade Pandu Rangaiah</i>	465



<b>Chapter 15</b>	Application of Adaptive Random Search Optimization for Solving Industrial Water Allocation Problem <i>Grzegorz Poplewski and Jacek M. Jeżowski</i>	505
<b>Chapter 16</b>	Genetic Algorithms Formulation for Retrofitting Heat Exchanger Network <i>Roman Bochenek and Jacek M. Jeżowski</i>	545
<b>Chapter 17</b>	Ant Colony Optimization for Classification and Feature Selection <i>V. K. Jayaraman, P. S. Shelokar, P. Shingade, B. D. Kulkarni, B. Damale and A. Anekar</i>	591
<b>Chapter 18</b>	Constraint Programming and Genetic Algorithm <i>Prakash R. Kotecha, Mani Bhushan and Ravindra D. Gudi</i>	619
<b>Chapter 19</b>	Schemes and Implementations of Parallel Stochastic Optimization Algorithms: Application of Tabu Search to Chemical Engineering Problems <i>B. Lin and D. C. Miller</i>	677
<b>Index</b>		705