

## Productivity Report Dr. Oliver Schütze

During my stay at the UAM Cuajimalpa (Oct. 2018 to Oct. 2019) I have been addressing the design and analysis of algorithms for the numerical treatment of multi- and many objective optimization problems. In the following I list the results that were obtained until early October 2019. Some more results are to be expected until December 2019 in particular from journal publications from manuscripts that have been submitted during my time of the sabbatical stay.

### Publications

**Text Books:** 5 text books on middle school and high school level. Attached 3 preliminary covers for the books on high school level.

- (B1) Algebra. Text book on high school level. Editor: Punto Fijo (in press)
- (B2) Calculo Diferencial. Text book on high school level. Editor: Punto Fijo (in press)
- (B3) Calculo Integral. Text book on high school level. Editor: Punto Fijo (in press)
- (B4) Calculo Mental. Text book on middle school level. Editor: Punto Fijo (in press)
- (B5) Problem Solving with Algebra. Text book on middle school level. Editor: Punto Fijo (comment: to be submitted to the editor until end of November)

**Journal Publications:** 9 publications in international journals. Out of them, ~~7~~ papers published in JCR journals, and 5 in Q1 journals: IEEE Transactions on Cybernetics, Swarm and Evolutionary Computation (twice), Neural Networks and Mathematics.

- (J1) O. Cuate, L. Uribe, A. Lara, O. Schütze. A Benchmark for Equality Constrained Multi-objective Optimization. Swarm and Evolutionary Computation (to appear)
- (J2) O. Cuate, L. Uribe, A. Lara, O. Schütze. Dataset on a Benchmark for Equality Constrained Multi-objective Optimization. Data in Brief (to appear)

- (J3) L. Uribe, A. Lara, O. Schütze. On the Efficient Computation and Use of Multi-objective Descent Directions within Constrained MOEAs. *Swarm and Evolutionary Computation* (to appear)
- (J4) J. M. Bogoya, A. Vargas, O. Schütze. The Averaged Hausdorff Distances in Multi-objective Optimization: A Review. *Mathematics*. 7(10): 894, 2019.
- (J5) O. Cuate, O. Schütze. Variation Rate to Maintain Diversity in Decision Space within Multi-Objective Evolutionary Algorithms. *Mathematical and Computational Applications*. 24(3): 82, 2019.
- (J6) D. Laredo, Z. Chen, O. Schütze, J.-Q. Sun. A Neural Network-Evolutionary Computational Framework for Remaining Useful Life Estimation of Mechanical Systems. *Neural Networks*. 116(1): 178-187, 2019.
- (J7) O. Schütze, O. Cuate, A. Martin, S. Peitz, M. Dellnitz. Pareto Explorer: A Global/Local Exploration Tool for Many Objective Optimization Problems. *Engineering Optimization* (<https://doi.org/10.1080/0305215X.2019.1617286>).
- (J8) A. Alvarado-Iniesta, O. Cuate, O. Schütze. Multi-objective and many objective design of plastic injection molding process. *International Journal of Advanced Manufacturing Technology* (<https://doi.org/10.1007/s00170-019-03432-8>)
- (J9) V. A. Sosa-Hernández, O. Schütze, H. Wang, A. Deutz, M. Emerich. The Set-Based Hypervolume Newton Method for Bi-Objective Optimization. *IEEE Transactions on Cybernetics* (<https://www.doi.org/10.1109/TCYB.2018.2885974>)

**Conference Publications:** 5 publications in international conferences

- (C1) O. Cuate and O. Schütze. Pareto Explorer for Solving Real World Applications. 18th Mexican International Conference on Artificial Intelligence (MICAI 2019), 2019 (to appear)
- (C2) O. Cuate, O. Schütze. Variation Rate: an Alternative to Maintain Diversity in Decision Space for Multi-objective Evolutionary Algorithms. *Evolutionary Multiobjective Optimiation (EMO 2019)*, pp. 203-215, 2019.

- (C3) L. Uribe, O. Schütze, A. Lara. Toward a New Family of Hybrid Evolutionary Algorithms Evolutionary Multiobjective Optimization. Evolutionary Multiobjective Optimization (EMO 2019), pp. 78-90, 2019.
- (C4) O. Cuate, L. Uribe, A. Ponsich, A. Lara, F. Beltran, A. Rodríguez-Sánchez, O. Schütze. A New Hybrid Metaheuristic for Equality Constrained Bi-objective Optimization Problems. Evolutionary Multiobjective Optimization (EMO 2019), pp. 53-65, 2019.
- (C5) O. Cuate, O. Schütze, F. Grasso, E. Tlelo-Cuautle. Sizing CMOS operational transconductance amplifiers applying NSGA-II and MOEA. 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), pp. 149-152, 2019.

### **Honors and Awards**

- (H1) Second Place of the Springer Best Paper Award in the 10th International Conference on Evolutionary Multi-Criterion Optimization for the paper

Variation Rate: An Alternative to Maintain Diversity in Decision Space for Multi-objective Evolutionary Algorithms  
by O. Schütze and O. Cuate.

- (H2) Associate Editor of Engineering Optimization since October 2019.

### **Editorial Activities**

- (E1) Special issue "Numerical and Evolutionary Optimization" connected to the event NEO 2018. The special issue was closed in July 2019 and has a total of 11 papers, see [https://www.mdpi.com/journal/mca/special\\_issues/NEO18](https://www.mdpi.com/journal/mca/special_issues/NEO18). Comment: the special issue will be published as an edited book by MDPI.
- (E2) Program committee member for around 10 international conferences.

### **Organization of Events**



(N1) Organization of the 7th International Workshop on Numerical and Evolutionary Optimization (NEO 201), held in Saltillo, Coahuila, from September 18 to 20. See <http://neo.cinvestav.mx/NEO2019/>.