Optimization and Engineering (2018) 19:813–814
https://doi.org/10.1007/s11081-018-9397-2

EDITORIAL

Announcement: Howard Rosenbrock Prize 2017

Nikolaos V. Sahinidis[1]

Received: 18 July 2018 / Revised: 18 July 2018 / Accepted: 18 July 2018 /
Published online: 25 July 2018

As the editor-in-chief of *Optimization and Engineering* (OPTE), I am delighted to announce the 2017 Rosenbrock Prize. This prize is awarded annually to honor the authors of the best paper published in OPTE in the previous year. The $500 prize is sponsored by Springer. Past recipients of the prize were Hicken (2014), Simon and Ulbrich (2015), and Kim and Wright (2016).

The winners of the 2017 Rosenbrock Prize are **Hoai An Le Thi and Tao Pham Dinh** for their work titled, **Difference of convex functions algorithms (DCA) for image restoration via a Markov random field model** (Le Thi and Pham Dinh 2017). Hoai An Le Thi is with the Department for Management of Science and Technology Development and the Faculty of Mathematics and Statistics at Ton Duc Thang University in Vietnam as well as with the Laboratory of Theoretical and Applied Computer Science at the University of Lorraine in France. Tao Pham Dinh is with the Laboratory of Mathematics at INSA Rouen Normandie in Saint-Etienne-du-Rouvray, France.

This year's winning paper was selected by a committee composed of the committee-chairman Roy H. Kwon (University of Toronto, Canada) and committee-members Marina Epelman (University of Michigan, USA) and Makoto Ohsaki (University of Kyoto, Japan). The group produced the following citation for the winning paper:

> Image restoration is an important activity which can aid greatly in scientific discovery, medical diagnosis, and many other domains. The image restoration problem can be cast as an optimization problem after modeling it through a Markov random field. However, the resulting energy minimization problem is non-convex and NP-hard. Most approaches to compute solutions for this energy minimization rely on meta-heuristics such as genetic algorithms or simulated annealing as well approaches based on graduated non-convexity. Major limitations of these approaches include slow convergence and non-optimality of computed solutions. This paper presents a difference of convex

✉ Nikolaos V. Sahinidis
sahinidis@cmu.edu

1 Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, USA

functions algorithms (DCA) approach to develop fast and scalable methods to approximate the non-convex and non-smooth Markov random field model. The advantages of casting the image restoration problem through difference of convex functions (DC) programming is that application of DCA results in finite termination and guarantee of local optimality. Several versions of the DCA methods are developed in the paper and numerical tests show that DCA approaches offer considerable improvement over standard approaches as well as over state of the art graph-cut-based methods. In summary, this paper is an excellent example of creative use of modern convex optimization to help tackle an important engineering problem.

The Rosenbrock Prize is named after Howard Rosenbrock, who was a pioneer in modern control theory and practice (Anjos 2015). Rosenbrock made excellent contributions in bridging the gap between optimization and engineering, which is also the primary focus of OPTE. Our journal provides a forum for researchers in both engineering and optimization to learn about new developments in optimization, and challenging and successful applications of optimization in engineering. OPTE publishes high-quality articles at the interfaces between engineering and optimization. We encourage submissions from our readers and anyone else interested in exploring the interfaces between optimization and engineering.

References

Anjos MF (2015) Announcement: Inaugural Howard Rosenbrock Prize. Optim Eng 16(3):507–509

Hicken JE (2014) Inexact Hessian-vector products in reduced-space differential-equation constrained optimization. Optim Eng 15(3):575–608

Kim T, Wright SJ (2016) An $S\ell_1$ LP-active set approach for feasibility restoration in power systems. Optim. Eng. 17(2):385–419

Le Thi HA, Dinh TP (2017) Difference of convex functions algorithms (DCA) for image restoration via a Markov random field model. Optim. Eng. 18(4):873–906

Simon M, Ulbrich M (2015) Adjoint based optimal control of partially miscible two-phase flow in porous media with applications to CO_2 sequestration in underground reservoirs. Optim. Eng. 16(1):103–130