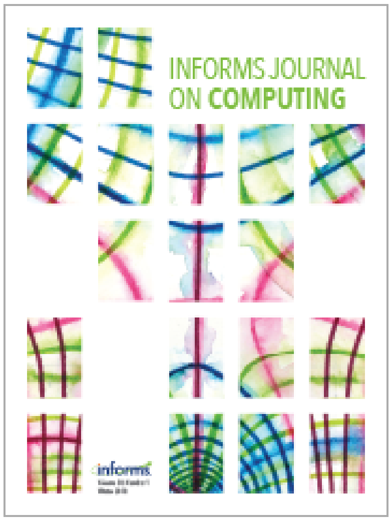

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Note from the Editor

Alice E. Smith

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Note from the Editor

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This note from the editor-in-chief begins a new annual tradition—recognizing the two papers published in the *INFORMS Journal on Computing* (*IJOC*) that had the most citations and the most downloads during the previous year. In this case, the previous year is 2018 and these are the two articles:

Most Cited During 2018 According to Web of Science

Scatter Search and Local NLP Solvers: A Multistart Framework for Global Optimization

Zsolt Ugray, Leon Lasdon, John Plummer, Fred Glover, James Kelly, Rafael Martí
INFORMS Journal on Computing (2007) 19(3):328–340
https://doi.org/10.1287/ijoc.1060.0175

Most Downloaded During 2018

Feature Article—The World Wide Web: Opportunities for Operations Research and Management Science

Hemant K. Bhargava, Ramayya Krishnan
INFORMS Journal on Computing (1998) 10(4):359–383
https://doi.org/10.1287/ijoc.10.4.359

I had some fun cruising the web to find where the authors currently work to notify them of their recognition and to invite them to comment on their paper with the wisdom of time. I am happy to include their retrospections in full below.

From Fred Glover, James Kelly, Leon Lasdon, Rafael Martí, and Zsolt Ugray (sadly, John Plummer has since passed away):

> Before 2007 there was little published literature on multistart algorithms for constrained nonlinear programming (NLP) and nonlinear mixed integer programming (MINLP), although some important algorithms had been developed for bound-constrained problems. In our 2007 paper, we described an efficient heuristic which uses the scatter search implementation OptQuest to generate trial solutions, and filtering heuristics utilizing results of previous iterations to determine which trial solutions would become starting points for a constrained local NLP solver. Our work was motivated by the discovery in the 1999 *IJOC* article of Fleurent and Glover (1999) on the quadratic assignment problem that adaptive memory strategies at the heart of tabu search, which include the scatter search strategy, improve significantly over previous multistart methods that do not use adaptive memory. We hoped to expand the scope of multistart methods, stimulate developers to implement new multistart algorithms, and encourage the inclusion of these algorithms in modeling languages. The flexibility of this framework—many possible trial solution generators and local solvers, simpler or more complex filters or none at all—was appealing. But we recognized that the procedures used to handle discrete variables could be improved.
>
> Multistart options are now included among the solvers linked to several widely used modeling languages including: the built-in Solver in Microsoft Excel, Frontline Systems' enhanced Excel Solver, MATLAB, TOMLAB, AMPL, AIMMS, and LINGO. Since 2007, some of us explored improved filter logic and randomized trial point generators (Ugray et al. 2009) and applied these to feasibility-seeking in NLP (Lasdon and Plummer 2008). Articles on multistart in combinatorial optimization include James et al. (2009) and Glover (2000, 2016). Recently, Martí and others have published a survey of multistart methods in combinatorial optimization, MINLP, and NLP (Martí et al. 2018).
>
> Citations of our 2007 paper between 2007 and 2018 (277 in all) found by Scopus Metrics grew slowly in early years (less than 5 per year between 2007 and 2010), but then increased steadily to over 50 per year in 2017 and 2018. A classification of the scientific areas from which the citing papers come shows a majority from engineering; then the natural sciences; then control theory, mathematics, and others.
>
> We wish to remember the late John Plummer, a brilliant analyst and programmer, whose efforts contributed so much to our work.

From Hemant K. Bhargava and Ramayya Krishnan:

> In the mid-1990s, soon after commercial use of the internet began, and TCP/IP standards became widespread, we

began discussing how the web could be leveraged for computational work, specifically OR/MS models. We recognized that the limitations of machine-specific computation—the need for models, data, and solvers to all be on the same machine or network, and be built specifically to work on them—worked against more widespread use of OR/MS models. Web technologies offered the potential to break this gridlock. The initial web had some, although limited, provision for distributed computation (versus mere display of HTML content). Subsequently, numerous advancements for distributed web-based computation had occurred within a few years, and we felt that the larger OR/MS community would benefit from knowledge of the vast array of new technologies—tools, languages, standards, programming methods—that could transform how OR/MS work was done and practiced. This is why we set about writing this article. Other catalysts for the paper included Harvey Greenberg and Art Geoffrion who had mentored and championed our work, and our experience within the DecisionNet project which aimed to lay out an electronic marketplace in which decision models, data, and other objects could be offered or used over a distributed computational network.

We believe we did a thorough job of exploring the range of relevant computational solutions, illustrating them, and organizing them all into a meaningful framework. There was, of course, a lot we did not know then and wish now that we did! For instance, we did not pay much attention to the market and economic aspects of leveraging the web for OR/MS computations. Similarly, while there are many brilliant examples of OR/MS deployments on the web, those interested in such deployments are often throttled by the lack of a reliable and enduring "public" infrastructure (e.g., an INFORMS server) for hosting, maintaining, and managing the use of data, models, and solvers. Still, many of the ideas presented in the article have survived in the intervening 20 years, and have become even more relevant in today's era where data and computation have become ubiquitous. Today, one doesn't think twice about the limitations of machine-specific computation when engaging with applications which deploy OR/MS methods: web-standard APIs and other such tools allow us to interact with and execute highly complex models and solvers with the swipe of a finger on our smartphones! Thanks to the work of Tim Berners-Lee and his intellectual descendants, OR/MS has lots more to gain as computation moves from the confines of local computing devices to anytime, anywhere, on anything.

I hope you enjoyed these insightful commentaries and agree that we need to do more to recognize the impactful papers and authors of our *IJOC* heritage. This is a small first step in doing that. Look for other steps to be enacted soon in a similar vein.

My best wishes,

Alice E. Smith

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