

Current Status of the EMOO Repository, Including Current and Future Research Trends

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Abstract

This article briefly describes the EMOO repository, which has become much more than the simple list of bibliographic references that originated it. In its current state, the EMOO repository contains many web resources, including PhD theses, software, contact information of EMOO researchers and information about EMOO-related events. Such information has become a valuable source both for students and researchers interested in this area.

1 Introduction

This short note on the evolutionary multi-objective optimization (EMOO) repository intends to provide some of the main features of this repository, including a short discussion of its origins and my future expectations about its future.

2 Inception

The idea of having a repository of bibliographic references on EMOO originated as a personal need to keep track of the field while writing my PhD thesis between 1994 and 1996. However, time constraints kept me from crystallizing this idea for a few years. It was at the end of 1998 that I finally found the time to launch the first version of the EMOO repository, which was a simple list of about 100 bibliographic references.¹

¹Current URL at LANIA is: <http://www.lania.mx/~ccoello/EMOO>

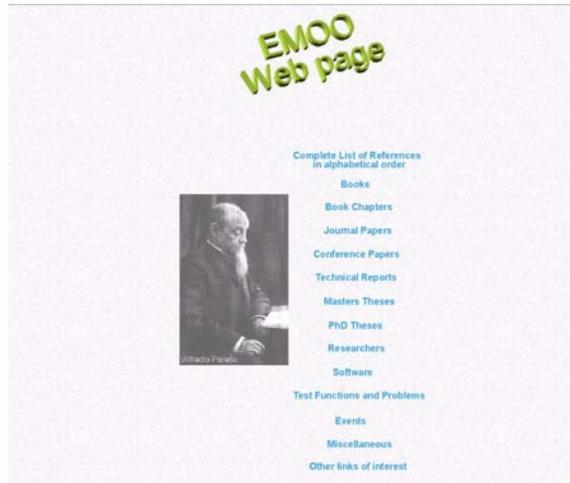


Figure 1: Initial web page of the EMOO repository.

Such bibliographic references were used in a survey that I published in 1999 [1] and therefore, the generation of such list was straightforward. To facilitate the access to these references, I used some web browsers to locate electronic versions of many of these papers and I put them in a web site at LANIA (my workplace at that time).

Upon sending awareness messages about the EMOO repository to several distribution lists, there was a very positive response from researchers and students from all over the world. Thus, the repository started growing very fast. By July 1999, I decided to split the bibliographic list in several parts. Thanks to the help of some of my graduate students at that time (mainly, with the help of Efrén Mezura Montes), we could launch an entirely newly designed web site by the end of 1999 (see Figure 1). In a very generous gesture, Dr. Sourav Kundu granted me access to the web site of the *Journal of Evolutionary Optimization* so that I could place a mirror of the EMOO repository in there. Such a mirror is no longer maintained. In the year 2002, Dr. Enrique Alba (from the University of Málaga, Spain) kindly agreed to maintain a mirror of the EMOO repository in Europe (located at: <http://neo.lcc.uma.es/emoo/index.html>).

3 Current Status

Since early 2001, the most up to date version of the EMOO repository is located at: <http://delta.cs.cinvestav.mx/~ccoello/EMOO>. The sites at LANIA and at the University of Málaga are maintained as mirrors to facilitate access in case of problems at the main site (physically located at CINVESTAV-IPN, in Mexico City). The full database (including web pages and papers electronically available) occupies about 500 MB of disk space).

As of January 2005, the EMOO repository contains:

- Over 1900 bibliographic references (the most complete list on EMOO avail-

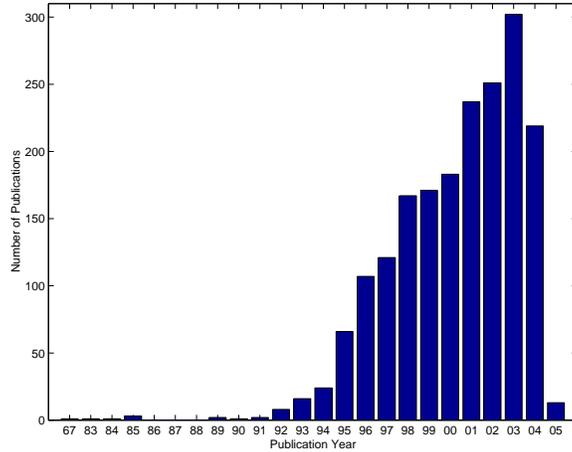


Figure 2: Number of publications on EMOO per year (up to mid January 2005).

able in the Internet), many of which are electronically available (local copies of each available paper are kept at each website hosting the EMOO repository, to avoid redirecting users to additional websites that may go out of service). It is worth mentioning that this list contains not only multiobjective optimization approaches based on evolutionary algorithms, but also those based on simulated annealing, tabu search, scatter search, the ant colony, particle swarm optimization, etc.

- 110 PhD theses and 21 Masters theses.
- Contact information of 62 EMOO researchers
- Public domain implementations of SPEA [8], NSGA [6], NSGA-II [4], the microGA [2], MOPSO [3], AMOPSO [7] and PAES [5], among other multi-objective evolutionary algorithms.

Publications of the EMOO repository are now classified as: books, book chapters, journal papers, conference papers, technical reports, masters theses, and PhD theses. Note however, that due to the fact that this classification process is done by hand, the only web page up to date at all times is the complete list of references. The others are normally behind in terms of updates.

The considerable growth of research in EMOO can be appreciated by analyzing the EMOO repository. For example, Figure 2 (generated using statistics automatically extracted from the EMOO repository) shows the historical growth of the number of publications in the field. Analyses of this sort are included in a recent book on EMOO that I co-authored with David A. Van Veldhuizen and Gary B. Lamont [3].

4 Looking to the Future

I have many future plans for the EMOO repository. The main ones are related to developing (with the help of other people, of course) more sophisticated design tools that facilitate the automatic generation of web pages by category (e.g., journal papers) using as a basis the main list. It would also be very useful to develop a more detailed database that allows to retrieve more precise statistics from the papers in the repository. The use of a browser that could allow searches within the main page would also be quite useful, but may be more difficult to achieve in the short term. I have also received suggestions to automate the addition of new entries to the repository, but the tools that were developed in the past for that sake are not operational anymore due to some changes in the software that they require. It is indeed the case that the progress in all sort of updates to the repository is slow because we rely on the help of volunteers (e.g., enthusiastic graduate students). Note also that the updates of the main list of references is still done by hand (therefore the delays at some times). Nevertheless, the many positive e-mail messages and oral communications that I have received regarding the EMOO repository motivates me to continue updating it. Therefore, I will continue doing any updates required for as long as this is possible and results useful for people interested in evolutionary multi-objective optimization.

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