Call for Participation in the workshop on

Understanding Machine Learning Optimization Problems

(to be held on July 13 or 14, 2019 at GECCO 2019 in Prague, Czech Republic)

Scope of the Workshop

Although recent works have shown how machine learning (ML) methods can actually benefit from incorporating evolutionary computation (EC) strategies[1], there still exists only little knowledge exchange between the two communities.
Our workshop tries to reduce the gap between ML and EC by discussing common ML problems in more detail with the overall goal of **improving the understanding** of their specific structure. Moreover, we want to investigate how and when EC could be used to solve certain ML tasks. Thus, we are interested in questions such as:

- What do the landscapes of ML problems look like?
- Which ML problems are of benign/malign nature for EC approaches (i.e., when should one consider incorporating EC into ML methods)?
- How similar are such problems to instances from popular EC benchmark suites?

In order to facilitate first analyses, we provide an initial set of ML problems[2] (related to real-world applications) and invite participants to contribute their insights into these problems. Submission could contain – but are definitely not limited to – any of the following related issues:

- applying exploratory landscape analysis to one of the aforementioned ML problems,
- analyzing algorithm (including portfolio) performances with a focus on "why",
- investigating existing problem solutions w.r.t. quality and/or diversity aspects,
- discussing (the feasibility of) commonly used performance metrics within these domains, or
- extending the provided set of test problems by contributing further optimization problems (from the ML domain), which are of relevance for real-world applications.

[1] See for instance:
- Tim Salimans, Jonathan Ho, Xi Chen, Szymon Sidor, Ilya Sutskever (2017). *Evolution Strategies as a Scalable Alternative to Reinforcement Learning*.
- Patryk Chrabaszcz, Ilya Loshchilov, Frank Hutter (2018). *Back to Basics: Benchmarking Canonical Evolution Strategies for Playing Atari*.
- Dennis G. Wilson, Sylvain Cussat-Blanc, Hervé Luga, Julian F. Miller (2018). *Evolving Simple Programs for Playing Atari Games*.

[2] `https://www.wi.uni-muenster.de/sites/wi/files/users/kerschke/gecco2019/gecco2019_umlop_mlda.pdf`

Submission Details

Submitted papers must not exceed 8 pages (excl. references) and are required to be in compliance with the GECCO 2019 Papers Submission Instructions (see `https://gecco-2019.sigevo.org/index.html/Papers+Submission+Instructions` for details). It is recommended to use the same templates as the papers submitted to the main tracks. Note that it is not required to remove the author information (i.e., the workshop paper won't be double-blind).
All accepted papers will be presented at the workshop and appear in the GECCO Conference Companion Proceedings. By submitting a paper, the author(s) agree that, if their paper is accepted, they will:

- Submit a final, revised, camera-ready version to the publisher on or before the camera-ready deadline, i.e., April 24, 2019.
- Register at least one author before April 24, 2019 to attend the conference.
- Attend the conference (at least one author).
- Present the accepted paper at the conference.

Important Dates

- Submission Deadline: **April 3rd, 2019**
- Notification of Acceptance: April 17th, 2019

Workshop Organizers

- Pascal Kerschke, University of Münster, Germany (kerschke@uni-muenster.de)
- Marcus Gallagher, University of Queensland, Australia (marcusg@uq.edu.au)
- Mike Preuss, Leiden University, The Netherlands (m.preuss@liacs.leidenuniv.nl)
- Olivier Teytaud, Facebook AI Research, Paris, France (olivier.teytaud@gmail.com)

Further Details

For further details, please see our workshop's website: `http://www.erc.is/go/gecco2019`.