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## ONE WORLD OPTIMIZATION SEMINAR

September 14<sup>th</sup>, 2020 @ 15:30 CEST (Central European Summer Time)

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#### The Era of “Non”-Optimization Problems

**Abstract.** This talk presents a systematic discussion of our comprehensive efforts in the study of modern “non”-optimization problems from the combined perspectives of motivation, theory, and algorithms. The study is documented in a forthcoming 700-page research monograph with the title: “Modern Nonconvex Nondifferentiable Optimization”, jointly authored by the speaker and Dr. Ying Cui at the University of Minnesota. Beginning with a 100-page of prerequisite mathematics and optimization background, the monograph introduces the combined paradigm of structured learning and computational optimization, with illustrations drawn from contemporary problems in statistical estimation, operations research, optimization, and their diverse subfields. The goal of this monograph is multi-fold:

- a) place the foundational and algorithmic treatment of nonconvexity and nondifferentiability on a rigorous footing, focusing in particular on problems where these two features are coupled;
- b) provide the basic concepts and powerful tools of nonsmooth analysis for this purpose;
- c) present a host of surrogation algorithms with convergence guarantees for computing stationary solutions of the appropriate kind;
- d) understand the roles of these computed solutions in the context of the source problems, and
- e) set a forward path for advanced research and to reach out to extended problems such as nonconvex noncooperative games, nonconvex stochastic programs, and robustification of nonconvex problems.

In short, our efforts aim to put in action the monumental treatise of Rockafellar and Wets on Variational Analysis, open it up for practical applications, and cement its sustained contributions in the era of “non”-optimization problems.

*The link of the zoom-room of the meeting and the corresponding password will be announced the day before the talk on the mailing list of the seminar, to which one can subscribe on <https://owos.univie.ac.at>.*