



**主题:** Fast optimistic continuous and discrete time methods for monotone equations and convex optimization problems

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### 摘要:

In this talk we discuss continuous in time dynamics for the problem of approaching the set of zeros of a single-valued monotone and continuous operator  $V$ . Such problems are motivated by minimax convexconcave and, in particular, by convex optimization problems with linear constraints. The central role is played by a second order dynamical system that combines a vanishing damping term with the time derivative of  $V$  along the trajectory, which can be seen as an analogous of the Hessian-driven damping in case the operator is originating from a potential. We show that these methods exhibit fast convergence rates for  $\|V(z(t))\|$  as  $t \rightarrow +\infty$ , where  $z(\cdot)$  denotes the generated trajectory, and for the restricted gap function, and that  $z(\cdot)$  converges to a zero of the operator  $V$ .

For implicit and explicit discrete time models with Nesterov's momentum, obtained by time discretization and aimed to solve monotone equations and fixed point problems, we prove that they share the asymptotic features of the continuous dynamics.

### 报告人简介:

Radu I. Bot, is Professor for Applied Mathematics with Emphasis on Optimization at the Faculty of Mathematics of the University of Vienna and Founding Member of the Research Platform "Data Science@Uni Vienna". Currently, he is the Dean of the Faculty of Mathematics of the University of Vienna and the Speaker of the Vienna Graduate School on Computational Optimization. He received his Diploma and his M.Sc. degree in Mathematics from the Babeş Bolyai University Cluj-Napoca, Romania and his Ph.D. degree and the Habilitation in Mathematics from Chemnitz University of Technology, Germany.

Radu I. Bot's research interests are in the areas of continuous time models and numerical algorithms for optimization and minimax problems, convex analysis, nonsmooth and variational analysis, monotone operator theory, and optimization methods for data science. His research is funded by the Austrian Science Fund, the Austrian Research Promotion Agency, the German Research Foundation, the Romanian National Research Council, the Australian Research Council, and by industrial partners. He is (co-) author of the books Duality in Vector Optimization and Conjugate Duality in Convex Optimization published by Springer.

Radu I. Bot, is member of the Editorial Board of the journals Numerical Functional Analysis and Optimization, Computational Optimization and Applications, Applied Mathematics and Optimization, Optimization Methods and Software, Optimization Letters, Journal of Optimization Theory and Applications, and SIAM Journal on Optimization.