Workshop
Optimization with
Partial Differential Equations

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Numerical Approaches to Regularized Nonlinear Programming

How can we solve minimization problems with structured objective function (sum of a smooth and a prox-friendly term) and smooth constraints? Penalty, augmented Lagrangian and barrier schemes have been proposed to tackle this problem class, reducing it to a sequence of structured subproblems that can be handled by proximal-gradient methods. After reviewing these schemes, this talk introduces a different approach that combines the augmented Lagrangian framework with the Moreau envelope, allowing the use of mature nonlinear programming technology. The resulting method, named Envelopt, comes with appropriate convergence guarantees in the nonconvex setting.