Domain Specific Languages for Embedded Convex Optimization

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Abstract:

Convex optimization problems can be globally solved quickly and reliably, raising the possibility of running optimization algorithms "in-the-loop", without human supervision. Furthermore, several solvers exist that target embedded, low-cost computational platforms for time-critical applications. We present a Python tool, based on CVXPY that takes an abstract description of family of optimization problems and generates custom a custom C solver for the specified problem family, enabling rapid prototyping and deployment of embedded convex optimization. We discuss the how this tool works, and provide several examples.