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Large-scale optimization strategies for optimal cancer treatment design

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Abstract

Treatment planning for radiation therapy is inherently complex due to the number of input parameters involved. The complexity is amplified by the uncertainty of target shapes due to organ motion, by dose estimation, by availability of biological information, and by competing multiple clinical objectives within the planning procedure. In this talk, we describe some of our approaches to cancer treatment design pertaining to these issues. Various optimization methods will be contrasted, and computational challenges will be discussed.