

## Extremal Problems for Convex Polygons

Charles Audet  
charles.audet@gerad.ca  
*GERAD*  
*École Polytechnique de Montréal*  
*C.P. 6079, succ. Centre-ville*  
*Montréal, Québec H3C 3A7*  
*CANADA*

### Abstract

Consider a convex polygon  $V_n$  with  $n$  sides, perimeter  $P_n$ , diameter  $D_n$ , area  $A_n$ , sum of distances between vertices  $S_n$  and width  $W_n$ . Minimizing or maximizing any of these quantities while fixing another defines ten pairs of extremal polygon problems (one of which usually has a trivial solution or no solution at all). We survey research on these problems, which uses geometrical reasoning increasingly complemented by global optimization methods. Numerous open problems are mentioned, as well as series of test problems for global optimization and nonlinear programming codes.

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