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*Minimizing the condition number to construct design points for polynomial regression models*

For the polynomial regression models of degree  $p$  with design space  $[-1, 1]$ , we introduce a new optimal design criterion by minimizing the condition number of the information matrix. It is well-known that the condition number is usually nonsmooth. However, we can show that for the polynomial regression models, the condition number is continuously differentiable. We have also shown that our new optimal designs are symmetric, and the number of support points is exactly  $p+1$ .