Rump’s model problem is the problem to globally minimize real polynomial product 2-norms:

\[ \mu_n = \min \{ \|PQ\|_2 \mid P, Q \in \mathbb{R}[z], \|P\|_2 = \|Q\|_2 = 1 \]

and \( \deg(P) = \deg(Q) = n - 1 \} \).

In our ISSAC 2008 paper we compute upper bounds for \( \mu_n \) for \( n \leq 79 \) and certified lower bounds for \( n \leq 14 \). It is possible from the optimal polynomials \( P \) and \( Q \) to compute integer polynomials with good lower bounds for the maximal single factor height ratio

\[ c_n = \max_{F,G} \chi_n \]

s. t. \( \min(\|F(z)\|_\infty, \|G(z)\|_\infty) = \chi_n \|F(z) \cdot G(z)\|_\infty \)

\( F, G \in \mathbb{Z}[z] \text{ irreducible, } \deg(F) + \deg(G) = n \)

and integer polynomials with Mahler measure near 1 [Lehmer’s problem]. My talk will describe our computational and search strategies, including those suggested by David Boyd and Lihong Zhi, and what polynomials I have found so far. (Received September 17, 2008)