

Essential dimension of PGL_n

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The problem of finding the essential dimension of the projective linear group PGL_n was first raised by Procesi in the 1960 who showed (in modern language) that the universal division algebra $\mathrm{UD}(n)$ (constructed by Amitsur and himself) has essential dimension at most n^2 . This gives the bound $\mathrm{ed}(\mathrm{PGL}_n) < n^2 + 1$.

Today, the bounds have been improved but the exact values of $\mathrm{ed}(\mathrm{PGL}_n)$ are still unknown for n greater than 6 and are an important open problem.

We will discuss some of the developments and recent results. We will show some techniques to find the essential dimension of certain central simple algebras. In particular, applying these to the universal division algebra $\mathrm{UD}(n)$ we obtain new bounds on the essential dimension of PGL_n relative to a prime p .