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A new method producing argument shift algebra for small dimension

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The problem of finding commutative subalgebras in universal enveloping algebras, so that the underlying Poisson algebras are determined by the argument shift method, has been suggested by Vinberg in the end of 1990-ies. There exist several approaches to its solution. I will describe a new construction that allows one to find such algebras in $U\mathfrak{gl}_n$ for small n. I believe this construction can be of some interest in general case, as it allows simple generalisations to other Lie algebras.