Orthogonal polynomials for higher-order Euler polynomials

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Abstract: Since recent results recognize higher-order Euler polynomials as the moments of certain random variables, it is natural to study the corresponding monic orthogonal polynomials. Based on the orthogonal polynomials with respect to the Euler numbers, obtained by Carlitz and Al-Salam, we identify the orthogonal polynomials with respect to higher-order Euler polynomials are the Meixner-Pollaczek polynomials, with certain arguments and constant factors. Applications, based on the connection to generalized Motzkin numbers, involve matrix and lattice path representations. Analogues for Bernoulli numbers and Bernoulli polynomials are also presented. This is joint work with Diane Y. H. Shi