A Generalization of Riesz Interpolation Formula

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We give a generalization of the well-known Riesz interpolation formula for trigonometric functions to the space of rational functions with poles off the unit circle in the complex plane. As examples of applications, we use the interpolation formula to obtain several inequalities as well as new proofs for some old inequalities, including the Bernstein inequality, Bernstein-Szego inequality, Marcinkiewicz-Zygmund inequality, and Lax inequality for rational functions and some recent polynomial inequalities of Vedenskii, Dubini, and Totik.