A graph descriptor encoded by the Ihara zeta function

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The Ihara zeta function of a graph is a function of complex argument defined as

$$Z(u) = \prod_{[C]} \left(1 - u^{|C|}\right)^{-1}$$

where $[C]$ runs over all the prime cycles of the graph and $|C|$ denotes the length of $[C]$. The Ihara zeta function of a connected graph that has no pendant vertices encodes several graph invariants, including its order, size, number of loops, girth, and number of spanning trees. In this talk we introduce a new graph descriptor that is encoded by the Ihara zeta function.