

Abstract Submitted
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Why Do Complex Systems Age? DERVIS VURAL, Harvard University and University of Illinois at Urbana Champaign, GREGORY MORRISON, L. MAHADEVAN, Harvard University — Aging can be defined as the increase in probability of death with time. The observation that organisms, colonies, ecosystems, as well as larger social structures age and die in very similar ways suggest that the reasons underlying aging does not depend sensitively on molecular or cellular details. In this work we argue that aging is an inevitable outcome of the neutral co-evolution of non-aging components which with time become increasingly interdependent. Starting from this hypothesis, we construct generic dependency networks and obtain mortality rate as a function of time, as well as mean life expectancy as a function of organism size, complexity and metabolic rate.

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