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Watching spherical cows die: the physics of human aging

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We're all going to die, and our collective mortality rate increases exponentially with age. As we get older, we also become more frail – which explains much of the increased mortality rate. Frailty involves multiple interacting health deficits, but can be quantitatively characterized. This has been done with traditional studies of human aging using cohorts of up to 10 000 individuals, as well as in new studies with electronic health records that are 10-100x larger. Our computational cohorts are even larger, and are helping us to explore aging with big data. I will tell you what we have done so far (a network model of aging), what we have learned (about the frailty maximum and about the effects of repair), and what we are doing now (using information measures in aging). I will also tell you a bit about the foundations of our work: information entropy, scale-free networks, and stochastic simulation algorithms (SSA).

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