Liste erstellt am 2011-02-26

Literatur

Aktuell

Couzin-Frankel 2011

Jennifer Couzin-Frankel, *What Would You Do?* science **331** (2011), 662–665.

As technology makes it easier to sequence people's DNA for research, scientists are facing tough decisions over what information to give back. The following scenarios could confront scientists conducting genetic studies. Would you share such findings with a research participant (or his or her parents) if it wasn't explicitly covered by a consent form? If the shoe were on the other foot, would you want to know these results?

- A 5-year-old boy has leukemia and is in a clinical trial for a new treatment. Genetic testing reveals that he's at a high risk of relapse, information that doesn't change how he's treated now. Do you tell the parents?
- A young, healthy woman is in the control group of a study looking for new diabetes genes. The study leaders find that she carries APOE4, which raises her risk of Alzheimer's. The disease remains unpreventable, though some measures may delay it. Would you tell her?
- A breast cancer survivor donated breast tissue several years ago to be banked for future studies. The tissue is now part of a big breast cancer study, and researchers discover that it carries a mutation for BRCA1. The mutation raises the risk of breast and ovarian cancer and can be passed to any children she may have. Would you find her and tell her?
- A 75-year-old man volunteers for a study of genes that affect aging. Researchers find that he carries an extra X chromosome, a condition that causes infertility and sometimes other problems too. Would you tell him?

Curry 2011

Andrew Curry, *Rescue of Old Data Offers Lesson for Particle Physicists.* science **331** (2011), 694–695.

Old data tends to get forgotten as physicists move on to new and better machines. The tale of the JADE experiment suggests that they should be more careful. A data archivist would be a mix of librarian, IT expert, and physicist, with the computing skills to keep porting data to new formats but savvy enough about the physics to be able to crosscheck old results on new computer systems.

Reed 2011

Sarah Reed, *Is There an Astronomer in the House?* science **331** (2011), 696–697.

With biomedical researchers analyzing stars and astronomers tackling cancer, two unlikely collaborations creatively solve data problems.

Anthropologie

Ward 2011

Carol V. Ward, William H. Kimbel & Donald C. Johanson, *Complete Fourth Metatarsal and Arches in the Foot of Australopithecus afarensis.* science **331** (2011), 750–753.

s331-0750-Supplement.pdf
The transition to full-time terrestrial bipedality is a hallmark of human evolution. A key correlate of human bipedalism is the development of longitudinal and transverse arches of the foot that provide a rigid propulsive lever and critical shock absorption during striding bipedal gait. Evidence for arches in the earliest well-known Australopithecus species, A. afarensis, has long been debated. A complete fourth metatarsal of A. afarensis was recently discovered at Hadar, Ethiopia. It exhibits torsion of the head relative to the base, a direct correlate of a transverse arch in humans. The orientation of the proximal and distal ends of the bone reflects a longitudinal arch. Further, the deep, flat base and tarsal facets imply that its midfoot had no ape-like midtarsal break. These features show that the A. afarensis foot was functionally like that of modern humans and support the hypothesis that this species was a committed terrestrial biped.

Biologie

JOHNSON 2002

C. N. Johnson, *Determinants of loss of mammal species during the Late Quaternary 'megafauna' extinctions: life history and ecology, but not body size.* Proc. Royal Society B **269** (2002), 2221–2227.
ProcRSocB269-2221-Supplement.pdf
Extinctions of megafauna species during the Late Quaternary dramatically reduced the global diversity of mammals. There is intense debate over the causes of these extinctions, especially regarding the extent to which humans were involved. Most previous analyses of this question have focused on chronologies of extinction and on the archaeological evidence for human-megafauna interaction. Here, I take an alternative approach: comparison of the biological traits of extinct species with those of survivors. I use this to demonstrate two general features of the selectivity of Late Quaternary mammal extinctions in Australia, Eurasia, the Americas and Madagascar. First, large size was not directly related to risk of extinction; rather, species with slow reproductive rates were at high risk regardless of their body size. This finding rejects the 'blitzkrieg' model of overkill, in which extinctions were completed during brief intervals of selective hunting of large-bodied prey. Second, species that survived despite having low reproductive rates typically occurred in closed habitats and many were arboreal or nocturnal. Such traits would have reduced their exposure to direct interaction with people. Therefore, although this analysis rejects blitzkrieg as a general scenario for the mammal megafauna extinctions, it is consistent with extinctions being due to interaction with human populations.
Keywords: extinction risk; megafauna; Pleistocene extinctions; overkill

Grundlagen

CLAUSET 2009

Aaron Clauset, Cosma Rohilla Shalizi & M. E. J. Newman, *Power-Law Distributions in Empirical Data.* arXiv (2009), 0706.1062v2. <http://arxiv.org/pdf/0706.1062v2>.
Power-law distributions occur in many situations of scientific interest and have significant consequences for our understanding of natural and man-made phenomena. Unfortunately, the detection and characterization of power laws is complicated by the large fluctuations that occur in the tail of the distribution—the part of the distribution representing large but rare events–and by the difficulty of identifying the range over which power-law behavior holds. Commonly used methods for analyzing power-law data, such as least-squares fitting, can produce substantially inaccurate estimates of parameters for power-law distributions,

and even in cases where such methods return accurate answers they are still unsatisfactory because they give no indication of whether the data obey a power law at all. Here we present a principled statistical framework for discerning and quantifying power-law behavior in empirical data. Our approach combines maximum-likelihood fitting methods with goodness-of-fit tests based on the Kolmogorov-Smirnov statistic and likelihood ratios. We evaluate the effectiveness of the approach with tests on synthetic data and give critical comparisons to previous approaches. We also apply the proposed methods to twenty-four real-world data sets from a range of different disciplines, each of which has been conjectured to follow a power-law distribution. In some cases we find these conjectures to be consistent with the data while in others the power law is ruled out.
Key words. Power-law distributions; Pareto; Zipf; maximum likelihood; heavy-tailed distributions; likelihood ratio test; model selection

Religion

Barkai 2008

Ran Barkai & Roy Liran, *Midsummer Sunset at Neolithic Jericho*. Time and Mind **1** (2008), 273–284.

The tower of Jericho is an architectural megalith dating roughly to 8300 BC, a time belonging to the Near East early Neolithic era, making it by far the oldest known monumental building. Ever since it was discovered there has been an unresolved debate for archaeologists and the general public alike regarding its function and purpose. The main three theories regarding the tower's purpose are that it may be part of a fortification system, that it is a part of a flood-deflection system, or that it is some sort of symbolic monument. There are, however, flaws within the fortification and flood-deflector theories, and to claim that it is a symbolic monument seems too much of a default solution, as a real reason for this is yet to be given. This paper looks beyond the site to the surrounding environment and analyses the architectural design to show that the tower is in fact inherently aligned to celestial and geographical elements, and that the ancient Neolithic builders used it as a link between them, their town, and the universe.