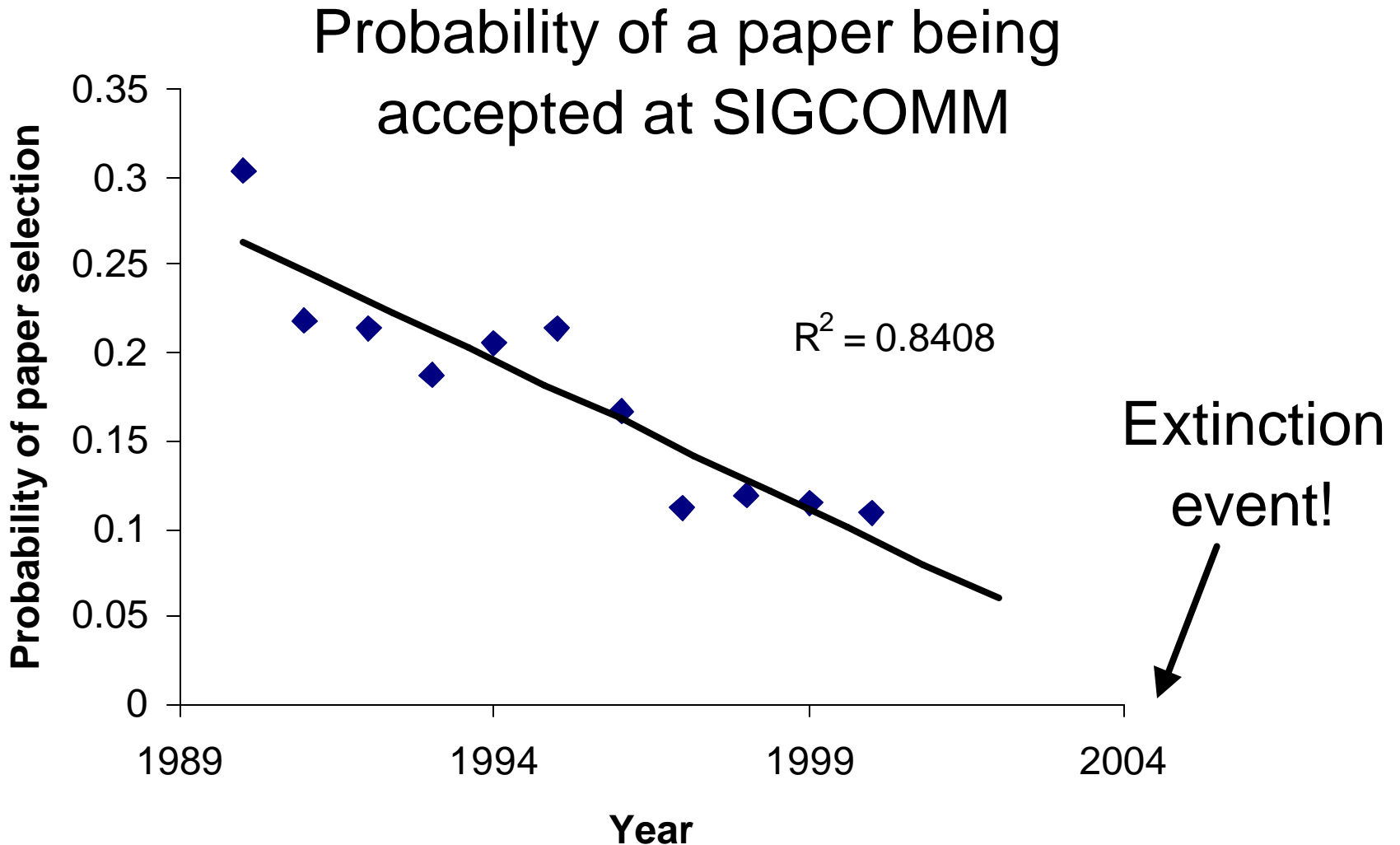


On the Biodiversity of SIGCOMM

Stefan Savage

University of Washington
University of California, San Diego

Review from last year



Hypothesis

- SIGCOMM population/environment unable to support itself through natural selection

Basic model

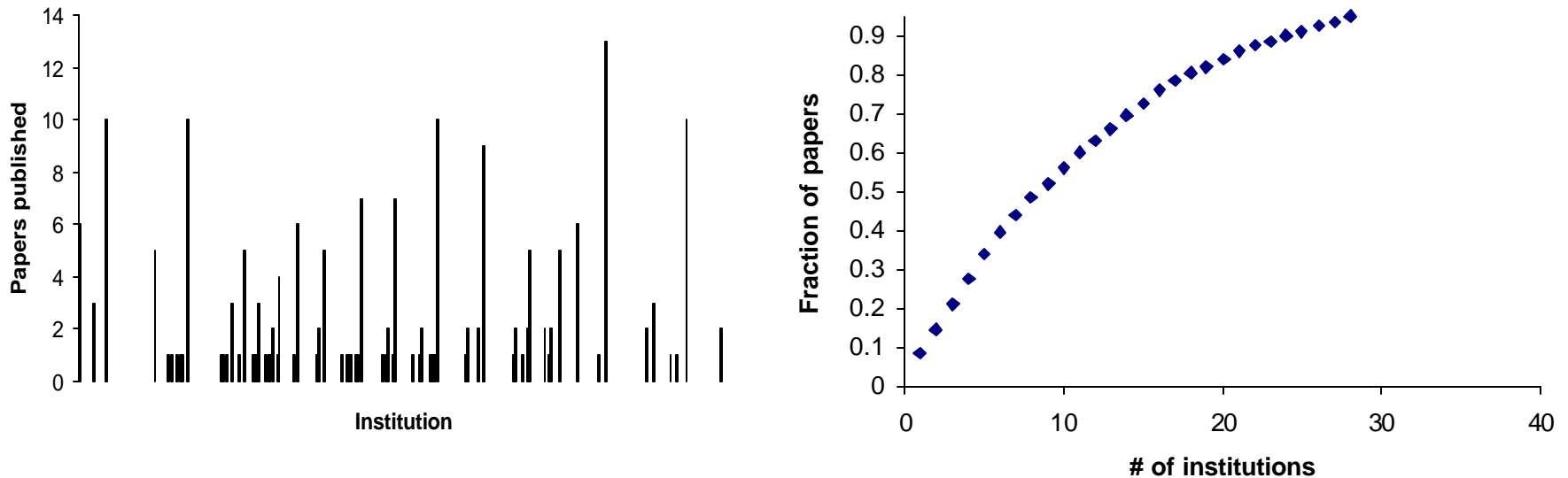
- Influenced by [Lacy87] model on conservation genetics for restoration ecology and [Shaffer90] population viability analysis
- Key factors:
 - Population size
 - Subpopulation dynamics
 - “Fitness”, ability for genotype to propagate
 - Allele frequency
 - Migration and/or environmental catastrophe
 - Selection

Population size

- Over last six years, 420 distinct authors
 - Clearly large enough to maintain genetic variability [Meffe and Carroll 94]
- 76 distinct subpopulations
 - Subpopulations small
 - Non-panmictic (selective interbreeding)
 - Insufficient out-cross breeding
 - Scott Shenker clear exception

Subpopulations

- 15 institutions cover 70% of papers (and $> 50\%$ of authors)

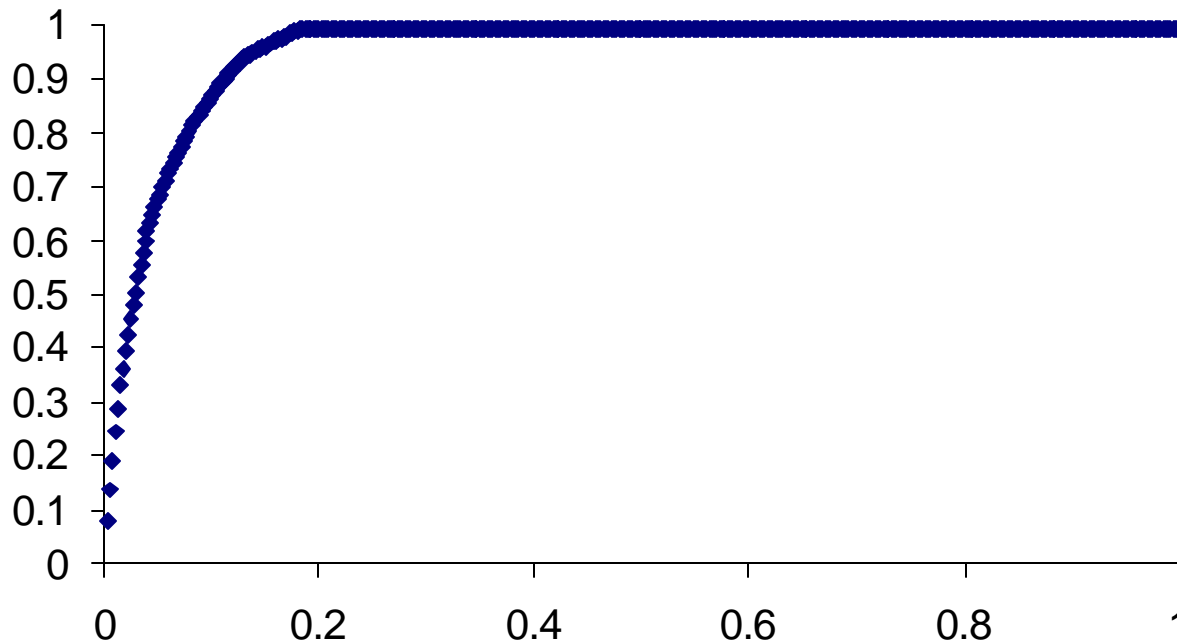


Fitness

- SIGCOMM survival traits are clearly recessive and X-linked
- Small founding set with dominant genes
 - 20 individuals supply >50% of papers
- Few founding individuals are fertile (i.e. produce viable offspring)
 - Randy Katz major exception

Fitness – high mortality

- 80% of authors never heard from again

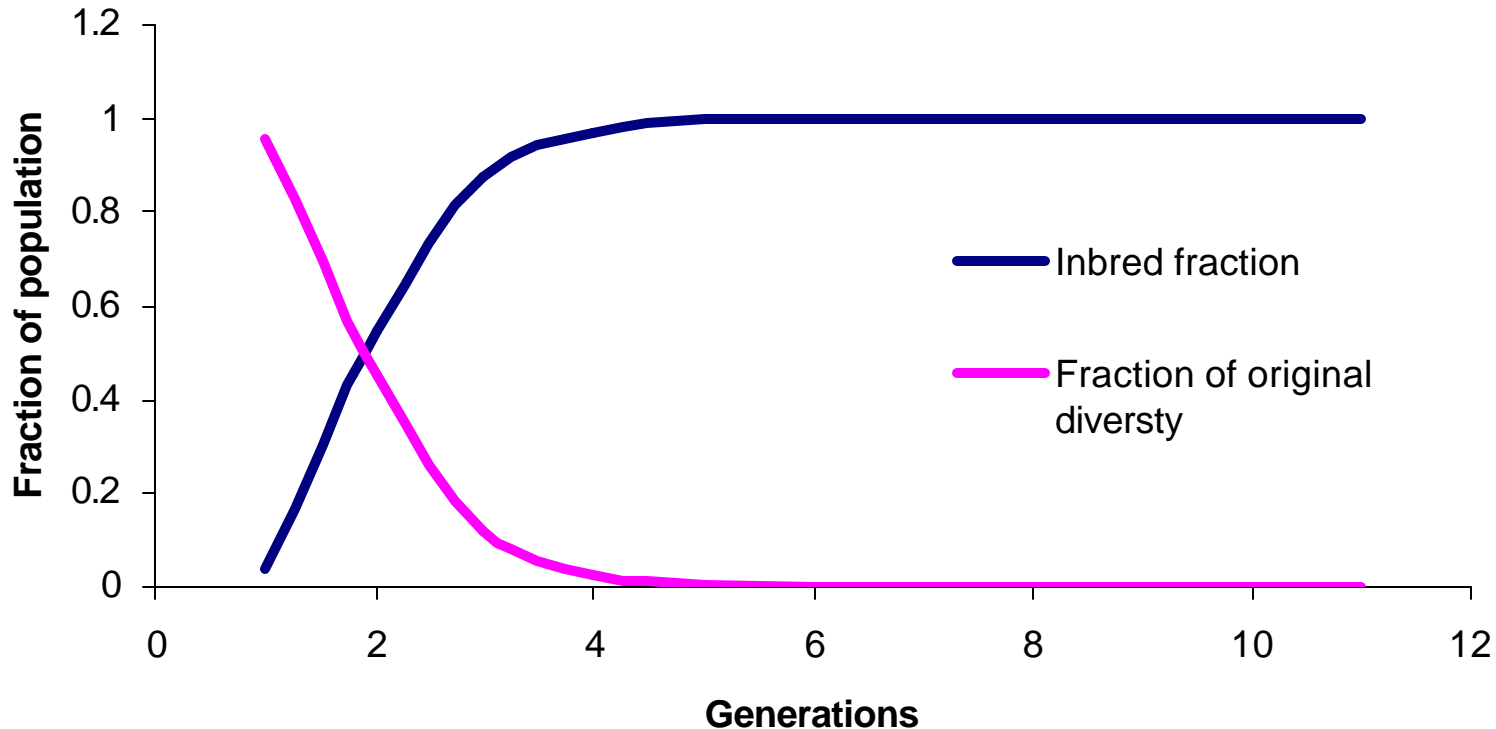


Migration

- Pure out-migration
 - \$34B in venture capital raised in 1999
 - Affects both “founder” stock and juveniles
 - Creates a “demographic bottleneck”
- See Shawn Ostermann’s predictions from 1998...

Selection

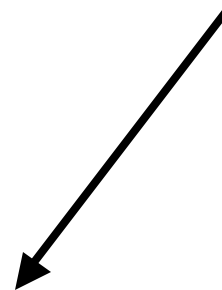
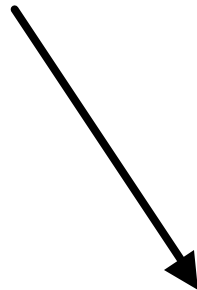
- Historical PC locality minor problem
- Using observed fitness/frequency #'s:



Summary and a proposal

- Little inter-population breeding, too few founders, low fertility, out-migration
- SIGCOMM authors classify for endangered species status
- Solution: selective breeding and cloning
 - Berkeley surrogacy (Katz)
 - Stud service from individuals with expressed phenotype (Shenker, Varghese, Zhang, etc)

A first attempt



Scott
Shenker



SIGCOMM: the Next Generation



Hi, I work on **high speed utility function lookups** for **mobile devices**