Contributed article

Trends in Computer Science Research

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Introduction

Computer science is an expanding research field. The number of research papers published has increased over the past two decades. Growing emphasis on externally funded research in most universities—increasingly influenced by funding opportunities—has driven this growth. Trend analysis plays a crucial role in understanding the direction of this research field.
Analysis

Datasets: Collected from 1990 - 2010

- ACM Dataset: ACM Digital Library
- IEEE Dataset: IEEE Xplore Digital Library
Analysis

Datasets Sizes
Landscapes of Computer Science research

(a) ACM: Frequency

(b) ACM: Fraction

(c) IEEE: Frequency

(d) IEEE: Fraction
Networks of Computer Science Research

(a) Security Cluster: 1995

(b) Multimedia Cluster: 1995

(c) World Wide Web Cluster: 2001

(d) Internet Cluster: 2001
Communities of CS researchers

![Graph showing the number of chains vs evolutionary chain length for ACM and IEEE.]
Key Findings

• CS continues to experience continuous and fundamental transformation.

• CS research teams are short-lived and small-sized 4-6 researchers, half of which leaves in four years.

• A typical scientist’s research focus changes in a 10-year cycle and often includes a once-in-a-career dramatic shift, likely in response to evolving technology creating new CS fields.

• A burst of new keywords in grants precedes their burst in publications; less than 1/3 of new keywords burst in publications first, reflecting the importance of funding for success of new CS fields.